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# Analysis of Respirator Cartridge Performance Testing on a Hanford AW Tank Farm Exhauster Slipstream

**March 2017**

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Prepared for  
the U.S. Department of Energy  
under Contract DE-AC05-76RL01830

Pacific Northwest National Laboratory  
Richland, Washington 99352



## Executive Summary

Washington River Protection Solutions (WRPS) conducted tests using two types of chemical cartridges for use in air-purifying respirators (APR) to determine the period of time that the cartridges would provide adequate performance for APRs used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from vapors exiting the exhauster for the Hanford AW tank farm. The Occupational Safety and Health Administration (OSHA) identifies cartridge testing as a valid approach for establishing a cartridge service life. Testing is commonly applied in situations where mixtures of COPCs exist, and where other approaches, such as manufacturer recommendations and modeling, are less reliable. The tests were designed and conducted to assure measurement and/or control of the key variables OSHA identified as important to estimate cartridge service-life, including temperature, humidity, COPC concentration, breathing rate, and cartridge adsorption capacity.

Testing was conducted from September 23–25, 2016, on a slipstream from the AW exhauster, under static conditions fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges, SCOTT 7422-SD1 and SCOTT 7422-SC1 (SCOTT Safety, Monroe, North Carolina), were assessed on separate days. Sample media (sorbent tubes) were used to collect samples of the vapor stream entering and exiting the respirator cartridge, and were subsequently analyzed for COPC concentrations. Pacific Northwest National Laboratory was tasked with conducting an independent analysis of the analytical results and making recommendations based on the results for respiratory cartridge performance and service life. The key conclusions from the analysis are described below:

- Based on measured cartridge inlet vapor concentrations from the AW exhauster, two COPCs, ammonia and N-Nitrosodimethylamine (NDMA), exceeded their corresponding Occupational Exposure Limits (OEL).<sup>1</sup> One COPC, N-Nitrosomethylethylamine (NMEA), had one or more inlet concentration measurements greater than 10% of its OEL, but less than 100%. N-Nitrosodiethylamine had a detection limit (DL) of approximately 24% of the OEL, but all inlet and outlet measurements were less than DL. All other COPC inlet and outlet measurements did not exceed 10% of their OELs.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 106% of its OEL (26.5 ppm) during the testing, which was lower than average (158%) and maximum (644%) historical measurements from the exhauster. The lowest concentration observed was 41.8% of the OEL for the SCOTT 7422-SD1 cartridge for the 12 hour measurement. For the SCOTT 7422-SC1 cartridge, ammonia appeared to break through the cartridge above 10% of the OEL after 12 hours. For the SCOTT 7422-SD1 cartridge, the outlet concentrations were less than the detection limit (DL) initially, began increasing gradually after 12 hours, but remained below 10% of the OEL through the end of the test.
- Cartridge inlet concentration measurements for NDMA reached 1638% of its OEL (4.9 ppb), which was higher than the average (963%) and slightly lower than the maximum (2163%) historical concentration measurements from the exhauster. However, all outlet concentrations were less than the analytical reporting limit (RL) of approximately 11% of the OEL, indicating no breakthrough for either cartridge.

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<sup>1</sup> Occupational Exposure Limits accepted for Hanford Tank Farm use are based on OELs established by a U.S. governmental agency or national professional organization (e.g., OSHA, National Institute for Occupational Safety and Health, American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs using non-U.S. exposure limits, other established OELs for chemical surrogates when available, or other standard procedures. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Cartridge inlet concentration measurements for NMEA reached a maximum of 14% of its OEL (0.04 ppb) and average concentration of approximately 12% of OEL. The average concentration was slightly lower than average historical measurements from the exhauster. All outlet concentrations were less than the analytical RL of approximately 9.2% of the OEL, indicating no breakthrough for either cartridge.
- All inlet and outlet concentrations for NDEA were less than the analytical RL of approximately 24% of the OEL, indicating no breakthrough for either cartridge.
- The experimental results in this study support a 12-hour service life for the use of SCOTT 7422-SC1 and 7422-SD1 cartridges in APRs employed to protect workers at the Hanford AW tank farm, under the same conditions as those tested. Additional respirator cartridge and respirator selection evaluations by Industrial Hygiene professionals are recommended to determine proper respiratory protection requirements. Variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact the experimentally derived cartridge service life, especially if OEL thresholds are exceeded. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of an appropriate respirator cartridge change-out schedule for adequate worker protection.



## Acronyms and Abbreviations

ALS	ALS Environmental Salt Lake City
APR	Air Purifying Respirator
CBAL	Columbia Basin Analytical Laboratory, part of the RJ Lee Group
CFR	Code of Federal Regulations
COPC	Chemicals Of Potential Concern
CVAA	Cold Vapor Atomic Absorption
DL	Detection Level
EPA	U.S. Environmental Protection Agency
GC-FID	Gas Chromatography-Flame Ionization Detector
GC/MS	Gas Chromatography/Mass Spectrometry
GC-TEA	Gas Chromatography-Thermal Energy Analyzer
HPLC	High Performance Liquid Chromatography
HPLC-UV	High Performance Liquid Chromatography-Ultraviolet
IC	Ion Chromatography
NDEA	N-Nitrosodiethylamine
NDMA	N-Nitrosodimethylamine
NIOSH	National Institute of Occupational Safety and Health
NMEA	N-Nitrosomethylethylamine
OEL	Occupational Exposure Level
OSHA	Occupational Safety and Health Administration
SCBA	Self-Contained Breathing Apparatus
ppm	Parts Per Million
PNNL	Pacific Northwest National Laboratory
RL	Reporting Level
SWIHD	Site-Wide Industrial Hygiene Database
TIC	Tentatively Identified Compound
TWINS	Tank Waste Information Network System
VOC	Volatile Organic Compound
WC	Water Column
WHL	Wastren Hanford Laboratory (222S)
WRPS	Washington River Protection Solutions



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## 1.0 Introduction/Project Description

As the Tank Operations Contractor for U.S. Department of Energy operations at the Hanford site, Washington River Protection Solutions (WRPS) is responsible for managing highly radioactive wastes stored in tanks at Hanford. WRPS recently identified the need to test air-purifying respirator (APR) chemical cartridges commonly used at Hanford Tank Farms. The tests were conducted to determine the period of time that the cartridges would provide adequate performance for APRs used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from any vapors exiting headspaces in the tanks. Occupational Safety and Health Administration (OSHA) Standard 29 Code of Federal Regulations (CFR) 1910.134(d)(3)(iii)(b)(2) specifies that for protection against gases and vapors, employers shall implement a schedule for cartridges to ensure that change-outs occur before the end of service life.[1-4] The change schedule can be based on objective information or data that ensures cartridge change-outs occur before the end of their service life.[2-5] The primary function of the WRPS APR Cartridge Test Program is to obtain objective data to determine service lives for the APR cartridges in use at Hanford Tank Farms. WRPS contracted Pacific Northwest National Laboratory (PNNL) to analyze the test data and offer an independent analysis and any recommendations. This report summarizes data analysis of cartridge testing on vapors from the exhauster on the Hanford AW tank farm.





## 2.0 Regulatory Requirements

### 2.1 Background on Regulatory Requirements

OSHA Respiratory Protection Standard (29 CFR 1910.134) mandates/requires that employers provide protective equipment, including respirators, to their employees to protect them against potential exposure to contaminants at or above documented Occupational Exposure Limits (OELs) and establish cartridge change-out schedules to ensure cartridges are changed before the end of service life.[1] End of service life is the time when a respirator cartridge can no longer filter/capture harmful contaminants (i.e., the cartridge no longer functions effectively).

Protective respirator cartridges are frequently used in workplaces with low contaminant concentrations, and where respirators provide essential protection for longer periods of time (>2 hours). If the contaminant concentration in a workplace is high, supplied air respirators (SAR) or self-contained breathing apparatuses (SCBA) must be used to provide additional protection. While the use of SARs or SCBAs offers more protection, a tradeoff exists, particularly for SCBAs that employ a large, heavy (~30 pounds), back-mounted compressed air cylinder.[1]

### 2.2 OSHA-Approved Methods for Determining Cartridge Change-Out Times

The National Institute of Occupational Safety and Health (NIOSH) certifies organic vapor cartridges using the criteria in 42 CFR 84, Approval of Respiratory Protective Devices. Still, there is no widely accepted, standard protocol for performing service-life testing.[4] However, OSHA has identified three valid approaches for establishing cartridge service lives.[3] These approaches are described below.

- *Conduct experimental tests* – First, gather all available information about the nature of all contaminants present in the workplace. Obtain breathing rates of workers and estimate worst-case exposures. For most employers, this approach is the most time consuming, and resources needed to perform these tests may not be available. If an employer has the resources needed to pursue this approach, it is the most reliable method of estimating cartridge service life. Concentrations at different points in time are obtained using actual respirator cartridges exposed to actual or simulated gases to gather service-life information. A safety factor that includes the assumptions made, variable factors, or conditions needs to be applied to the service life and used in the respiratory protection program. This approach is commonly used in situations where mixtures of contaminants are present and can also be used to validate an existing cartridge change-out schedule.
- *Use the manufacture's recommendation* – Once information about airborne contaminants (including concentrations, temperature, and humidity) has been obtained, contact the manufacturer of the respirator to be used and provide all the information. Manufacturers should be able to provide the exact objective information they used to project the service life. Using the information obtained, service lives are proposed. This approach is not as reliable as conducting application-specific experiments, and manufacturers may not have all the information for workplace hazards and user factors. If any safety factor is applied considering all the variable factors, it must be clearly identified in the respiratory protection program. For complex mixtures such as those present in the storage tanks at Hanford, manufacturer recommendations may be of limited value, and experimental testing is recommended.

- *Use mathematical models* – Mathematical models are usually applicable for single contaminant exposure situations. OSHA and NIOSH have worked over the years with researchers and industrial partners to develop mathematical models for predicting respirator cartridge service life.[3, 5-11] OSHA offers guidance on using mathematical models to estimate respirator cartridge service life based on single components, but the models have not been adopted for mixtures. NIOSH has developed a computer tool for estimating breakthrough times and service lives of respirator cartridges. Manufacturers can use those results to make service-life recommendations for their products (canister/cartridge) in multi-gas environments. Two types of mathematical models are used: 1) predictive models[3, 5-7] and 2) descriptive models.[9] Each model has its own mathematical basis for its estimations. To estimate the service lives of cartridges, the following information is needed:
  - the number of cartridges used by the respirator
  - the mass of the sorbent used in each cartridge
  - the carbon micro-pore volume
  - the density of the packed bed
  - the maximum temperature
  - the maximum relative humidity
  - the maximum concentration of the contaminants and the work (volumetric flow) rate.

The primary advantages of using mathematical models are that they are relatively inexpensive and take little time. However, the estimates are not as accurate as testing; sometimes modeling might result in a service-life estimate that is shorter than it needs to be because of conservative assumptions used during calculations.

In addition to the methods described above, “rules of thumb” can be allowed as part of the overall workplace organic vapor assessment for determining a cartridge change-out schedule. Chapter 36 of the American Industrial Hygiene Association publication, *The Occupational Environment: Its Evaluation and Control and Management*, outlines the approach.[12] The “rules of thumb” may not work for every chemical or situation, but provide an estimation of cartridge life. The following are rules of thumb outlined in the publication:

- If the compound’s boiling point is  $>70^{\circ}\text{C}$  and the concentration is  $<200$  ppm, a service life of 8 hours at a normal work rate can be expected.
- Service life is inversely proportional to worker breathing rate.
- Reducing the concentration of a contaminant by a factor of 10 will increase service life by a factor of 5.
- Relative humidity above 85% will reduce the service life by 50%.

These rules of thumb do not apply in certain situations, including for mixtures of hazardous contaminants (e.g., Hanford Tank Farm vapors) and inorganic gases such as ammonia, sulfur dioxide, and hydrogen sulfide, compositions that vary with time and location, and contaminants that undergo continuous reactions. However, some of the general drivers can help in interpreting the results obtained from experimental testing of respirator cartridges.

### 3.0 Description of Testing Program

Based on the OSHA guidance described in the previous section, a sample testing approach was pursued for quantifying respirator cartridge effectiveness for Hanford tank vapors. WRPS developed a sampling approach outlined in TFC-PLN-168, “Industrial Hygiene Sampling and Analysis Plan for Respirator Cartridge Testing,” and “Air Purifying Respirator Cartridge Test Apparatus, RPP-STE-59226.”[13,14]

Appendix A provides a description of the respirator cartridge testing setup developed by WRPS and used for measurements of vapors from the AW exhauster.[13-15] The test system and methodology were developed in consultation with recognized subject matter experts to follow the example of tank farm headspace field sampling for the purposes of cartridge testing.

The Sampling and Analysis Plan was developed under the direction and oversight of the Industrial Hygienist in conjunction with the Tank Farms Operations Contractor Retrieval and Closure, and Tank Farms Project and/or Production Operations Project Management Team, as applicable. Trained Industrial Hygiene Technicians under the direction of a qualified Industrial Hygienist collected chemical vapor samples from the influent and effluent sides of the cartridge test apparatus. Training was performed at HiLine Engineering (Richland, Washington) on the test stands for WRPS Sampling Equipment Operators, Industrial Hygiene Technicians, and the Field Work Supervisors, prior to transport of the stands to tank farms.

The APR cartridge test assembly was designed and constructed to operate without negative effects on performance to the following environmental conditions:

- Temperature: 32 to 115°F
- Relative Humidity: 5% to 100%
- Precipitation: Up to 4 inches in 6 hours
- Wind: Up to 20 mph with blowing dust.

To ensure the cartridges effectively protect the worker, WRPS developed a testing program with the following conservative conditions:

- The flow rate through each cartridge was set at 30 L/min (equivalent to 60 L/min for a pair of cartridges), which corresponds to more than twice the normal breathing rate and is slightly higher than OSHA recommended testing flow rate of 53.3 L/ min.[3,5]
- Tank farm vapors source sampling was performed on headspace vapors rather than from Hanford Tank Farm atmospheric concentrations (i.e., source sampling vs. the breathing zone).
- 10% of the OEL for each COPC was considered as a threshold concentration.

Using the cartridge testing setup described in Appendix A, separate test surveys were performed on two NIOSH-approved respiratory protection twin cartridges: SCOTT 7422-SD1 for Survey 1, and SCOTT 7422-SC1 for Survey 2.[16] These cartridges were chosen because they are suitable for capturing organic vapors, acid gases, ammonia, formaldehyde, and particulates.[16]

Vapor concentrations upstream and downstream of the APR cartridge were monitored with an array of sorbent tubes (see Appendix B). Influent (upstream) concentrations were measured at the beginning and end of each 16-hour verification survey. Downstream sorbent tubes were changed out every 2 hours until the experiment was finished. A measured quantity of sample air was drawn in through the sorbent tube (see Appendix A).[13,14] Compounds from the sorbent tubes were extracted and analyzed using analytical methods referenced in Appendix B.

The characteristics of 59 COPCs were the primary focus of the testing. The 59 COPCs represent a set of tank vapor chemicals found in a tank farm source greater than 10% of the OEL, or are considered “known” or “probable” carcinogens by the International Agency for Research Cancer or other regulatory agencies.[17,18] A full listing of these COPCs is shown in Section 4.0.

## 4.0 Data Analysis

Respirator cartridge testing on the AW exhauster was conducted from September 23–25, 2016. Each cartridge was tested for approximately 16 hours of continuous run time. Testing and analyses focused on the 59 COPCs identified in Table 1 and other hazardous airborne contaminants. Sorbent tubes were changed every 2 hours, and more than 200 sorbent tubes were sent to the 222S Laboratory at Hanford and dispositioned for analyses. Appendix C lists the raw data for all of contaminants analyzed during the tests, and Appendix D lists the corresponding calculated concentrations. Appendix C also gives the average temperatures of the sample slipstream during testing, which ranged from 57 to 76°F, and the average relative humidity ranged from 55 to 89%. Table 1 provides an overview of the results for each of the 59 COPCs. Note that nitrous oxide was not analyzed as it is not susceptible to respirator filtration, and there are no known NIOSH-approved respirator filtration cartridges approved for nitrous oxide. Additionally, methanol was not quantified as part of the COPC data set because it is used as a standard solvent and calibration standard in the analytical procedure for volatile organic compounds (VOC).

Table 1 shows the measured concentrations in the current study for all of the COPCs tested. Inlet concentrations of two COPCs, ammonia and N-Nitrosodimethylamine (NDMA), exceeded their corresponding OELs. The inlet (or outlet) concentrations of two additional COPCs were lower than their corresponding OELs or detection limits (DL) but still exceeded 10%. These COPCs were N-Nitrosodiethylamine (NDEA) and N-Nitrosomethylethylamine (NMEA). All four of these COPCs are highlighted in yellow in Table 1. All four COPCs identified above with measured concentrations or DLs exceeding 10% of their respective OELs are assessed in more detail in Section 5.0. Appendix E shows similar detailed assessments for an additional 13 COPCs with respirator cartridge inlet (or outlet) concentrations or DLs less than 10% of their OELs but greater than 2%. These COPCs were mercury, 1,3-butadiene, formaldehyde, furan, 2,3-dihydrofuran, 2,5-dihydrofuran, 2-methylfuran, 2,5-dimethylfuran, 2-pentylfuran, 2-heptylfuran, 2-propylfuran, N-Nitrosomorpholine and dibutyl butylphosphonate. All of the other COPCs had inlet (or outlet) concentrations less than 2% of their OELs or their DLs.<sup>1</sup>

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<sup>1</sup> The term “detection limit” is used here to refer either to analytical reporting limit (RL) or DL. The use of either an RL or a DL varied among analytical laboratories. An RL (equivalent to a limit of quantification) was used instead of an analytical method DL by several laboratories for specific COPC analyses. See Appendix C and F for additional information on the specific use of the RL or DL for each COPC.

**Table 1. Summary of Analyzed COPCs**

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL <sup>1</sup> (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
<b>Inorganic</b>						
1 Ammonia	7664-41-7	26.5 ppm	25 ppm	2.49%		Up to 106% of OEL for inlet values. All outlets <16.6%.
2 Nitrous Oxide	10024-97-2	Not Measured	50 ppm			
3 Mercury	7439-97-6	2.47 ug/m3	25 ug/m3	9.89%		Up to 7.3% of OEL for inlet values. All outlets <DL.
<b>Hydrocarbons</b>						
4 1,3-Butadiene	106-99-0	0.0203 ppm	1 ppm	2.03%	X	
5 Benzene	71-43-2	0.0002 ppm	0.5 ppm	0.026%		Up to 0.04% of OEL for inlet values. All outlets <DL.
6 Biphenyl	92-52-4	0.0003 ppm	0.2 ppm	0.141%	X	
<b>Alcohols</b>						
7 1-Butanol	71-36-3	0.213 ppm	20 ppm	0.004%		Up to 1.1% of OEL for inlet values. All outlets <0.007%.
8 Methanol	67-56-1	Not Measured	200 ppm			
<b>Ketones</b>						
9 2-Hexanone	591-78-6	0.0003 ppm	5 ppm	0.003%		Up to 0.005% of OEL for inlet values. All outlets <DL.
10 3-Methyl-3-butene-2-one	814-78-8	Not Detected	0.02 ppm	TIC <sup>2</sup>	X	
11 4-Methyl-2-hexanone	105-42-0	0.0002 ppm	0.5 ppm	0.031%	X	
12 6-Methyl-2-heptanone	928-68-7	Not Detected	8 ppm	TIC	X	
13 3-Buten-2-one	78-94-4	0.0006 ppm	0.2 ppm	0.092%		Up to 0.31% of OEL for inlet values. All outlets <DL.
<b>Aldehydes</b>						
14 Formaldehyde	50-00-0	0.0079 ppm	0.3 ppm	0.607%		Up to 2.6% of OEL for inlet values. All outlets <0.95%.
15 Acetaldehyde	75-07-0	0.0170 ppm	25 ppm	0.005%		Up to 0.07% of OEL for inlet values. All outlets <0.05%.
16 Butanal	123-72-8	0.0021 ppm	25 ppm	0.001%		Up to 0.009% of OEL for inlet values. All outlets <DL.
17 2-Methyl-2-butenal	1115-11-3	Not Detected	0.03 ppm	TIC	X	
18 2-Ethyl-hex-2-enal	645-62-5	Not Detected	0.1 ppm	TIC	X	

<sup>1</sup> Approximate Detection Limit (DL) is calculated using the reported DLs (or RLs) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.

<sup>2</sup> Tentatively Identified Compound (TIC) indicates that a mass spectrometry “peak” not associated with calibrated compounds has been tentatively assigned to a compound based on an adequate match to the analytical methods reference library. Reference standards for the compound are not available to accurately quantify, assign an analytical DL, or definitively confirm the identity of the TIC. TICs are reported when the peak area is sufficiently large, estimated as  $\geq 5$  nanograms of TIC mass, and other analytical criteria are met. For the respirator cartridge testing, this mass of TIC represents an approximate concentration of <1.0 ppb, based on the average of all TICs in the COPC list.

**Table 1. (continued)**

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL <sup>1</sup> (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
<b>Furans</b>						
19 Furan	110-00-9	0.06 ppb	1 ppb	5.65%	X	
20 2,3-Dihydrofuran	1191-99-7	0.03 ppb	1 ppb	3.03%		Up to 2.5% OEL for inlet values. All outlets <DL.
21 2,5-Dihydrofuran	1708-29-8	0.04 ppb	1 ppb	4.26%	X	
22 2-Methylfuran	534-22-5	0.04 ppb	1 ppb	3.58%	X	
23 2,5-Dimethylfuran	625-86-5	0.05 ppb	1 ppb	4.99%	X	
24 2-Ethyl-5-methylfuran	1703-52-2	Not Detected	1 ppb	TIC	X	
25 4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	Not Detected	1 ppb	TIC	X	
26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	Not Detected	1 ppb	TIC	X	
27 2-Pentylfuran	3777-69-3	0.04 ppb	1 ppb	4.16%	X	
28 2-Heptylfuran	3777-71-7	0.03 ppb	1 ppb	3.31%	X	
29 2-Propylfuran	4229-91-8	0.04 ppb	1 ppb	3.60%	X	
30 2-Octylfuran	4179-38-8	Not Detected	1 ppb	TIC	X	
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	Not Detected	1 ppb	TIC	X	
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not Detected	1 ppb	TIC	X	
<b>Phthalates</b>						
33 Diethylphthalate	84-66-2	0.0003 mg/m <sup>3</sup>	5 mg/m <sup>3</sup>	0.062%	X	
<b>Nitriles</b>						
34 Acetonitrile	75-05-8	0.256 ppm	20 ppm	0.001%		Up to 0.5% of OEL for all inlet values. All outlet values <1.3%.
35 Propanenitrile	107-12-0	0.0004 ppm	6 ppm	0.004%		Up to 0.006% of OEL for inlet values. All outlets <DL.
36 Butanenitrile	109-74-0	0.0002 ppm	8 ppm	0.003%		Up to 0.003% of OEL for inlet values. All outlets <DL.
37 Pentanenitrile	110-59-8	0.0002 ppm	6 ppm	0.004%	X	
38 Hexanenitrile	628-73-9	0.0002 ppm	6 ppm	0.003%		Up to 0.002% of OEL for inlet values. All outlets <DL.
39 Heptanenitrile	629-08-3	Not Detected	6 ppm	TIC	X	
40 2-Methylene butanenitrile	1647-11-6	Not Detected	0.3 ppm	TIC	X	
41 2,4-Pentadienenitrile	1615-70-9	Not Detected	0.3 ppm	TIC	X	

**Table 1. (continued)**

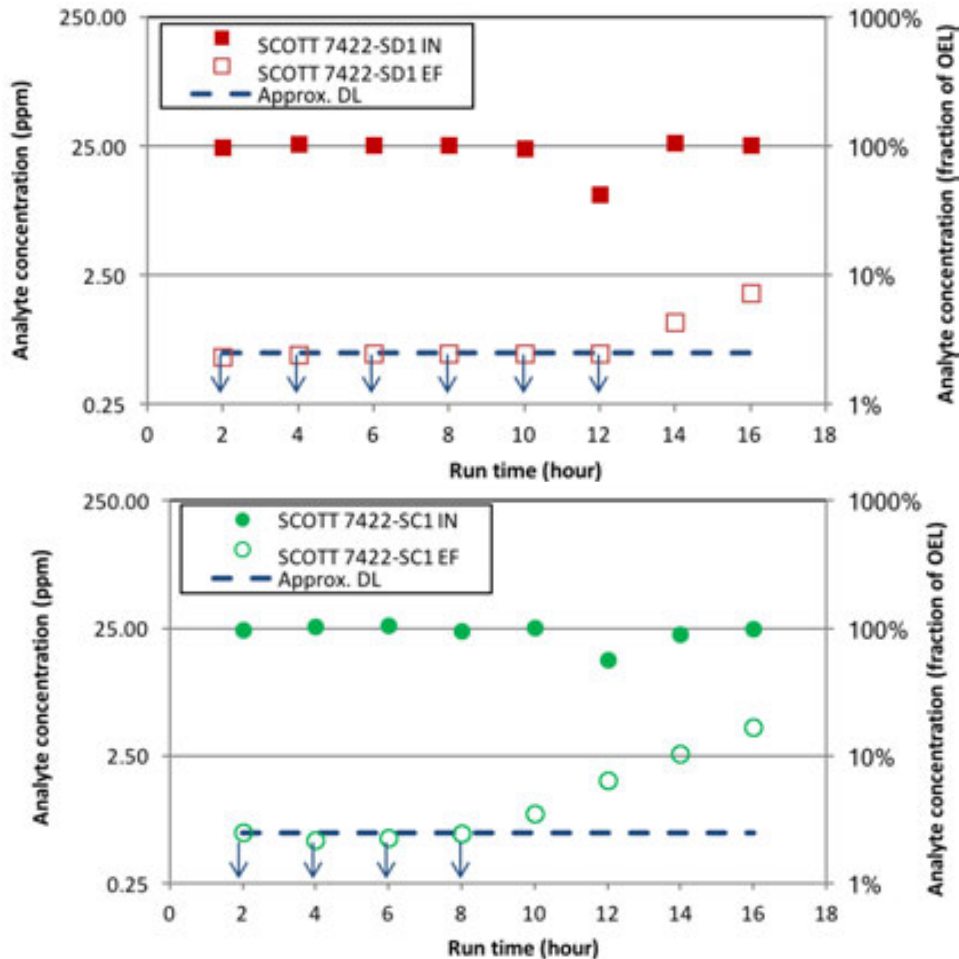
COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL <sup>1</sup> (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
<b>Amines</b>						
42 Ethylamine	75-04-7	0.0049 ppm	5 ppm	0.099%	X	
<b>Nitrosamines</b>						
43 N-Nitrosodimethylamine	62-75-9	4.91 ppb	0.3 ppb	10.7%		Up to 1638% of OEL for inlet values. All outlets <DL.
44 N-Nitrosodiethylamine	55-18-5	0.02 ppb	0.1 ppb	23.8%	X	All inlet and outlet values <DL. (23.8%)
45 N-Nitrosomethylethylamine	10595-95-6	0.04 ppb	0.3 ppb	9.18%		Up to 14% of OEL for inlet values. All outlets <DL.
46 N-Nitrosomorpholine	59-89-2	0.04 ppb	0.6 ppb	3.48%		Up to 6.2% of OEL for inlet values. All outlets <DL.
<b>Organophosphates</b>						
47 Tributyl phosphate	126-73-8	0.23 ppb	200 ppb	0.114%	X	
48 Dibutyl butylphosphonate	78-46-6	0.16 ppb	7 ppb	2.23%	X	
<b>Halogenated</b>						
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m <sup>3</sup>	TIC	X	
50 2-Fluoropropene	1184-60-7	Not Detected	0.1 ppm	TIC	X	
<b>Pyridines</b>						
51 Pyridine	110-86-1	0.35 ppb	1000 ppb	0.035%	X	
52 2,4-Dimethylpyridine	108-47-4	0.26 ppb	500 ppb	0.052%	X	
<b>Organonitrites</b>						
53 Methyl nitrite	624-91-9	Not Detected	0.1 ppm	TIC	X	
54 Butyl nitrite	544-16-1	Not Detected	0.1 ppm	TIC	X	
<b>Organonitrates</b>						
55 Butyl nitrate	928-45-0	Not Detected	2.5 ppm	TIC	X	
56 1,4-Butanediol, dinitrate	3457-91-8	Not Detected	0.05 ppm	TIC	X	
57 2-Nitro-2-methylpropane	594-70-7	Not Detected	0.3 ppm	TIC	X	
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	Not Detected	0.05 ppm	TIC	X	
<b>Isocyanates</b>						
59 Methyl Isocyanate	624-83-9	Not Detected	20 ppb	TIC	X	



## 5.0 Plots of COPCs with Significant Detected Values

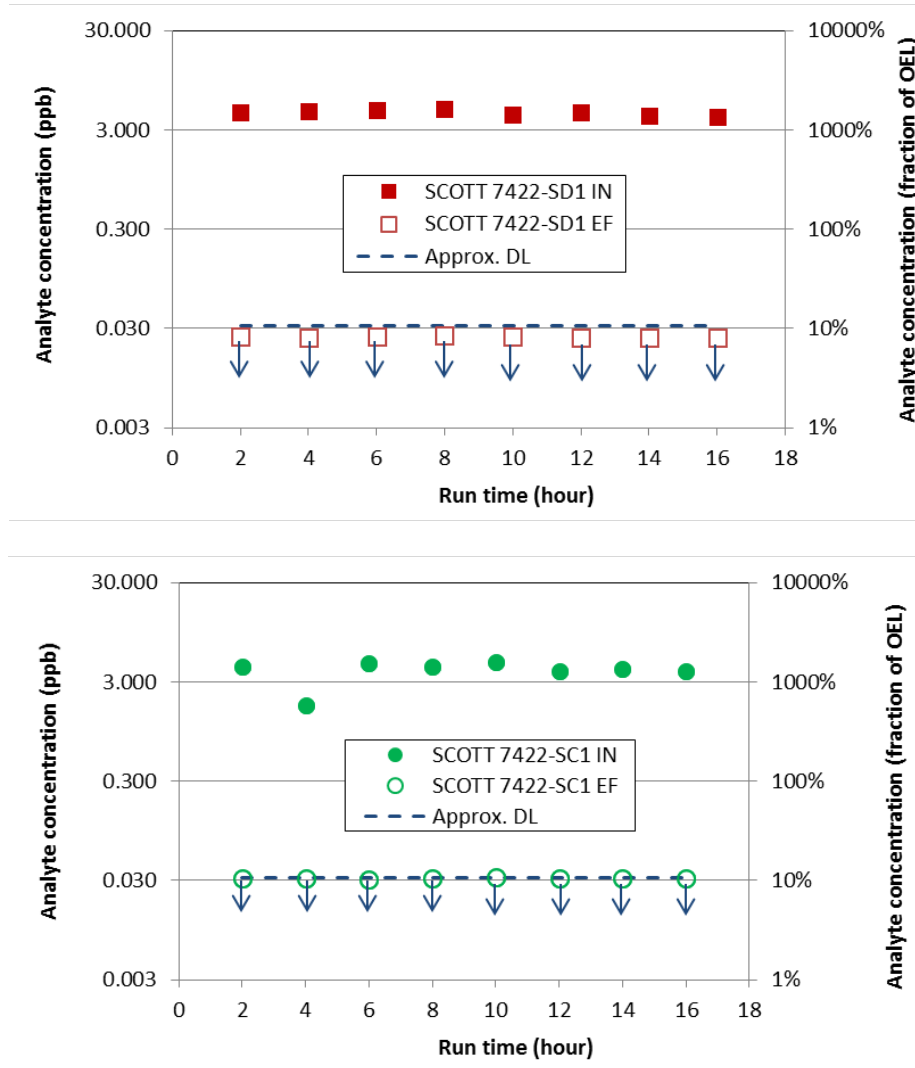
Of the 59 COPCs in Table 1, only ammonia and NDMA exceeded their OELs. Two additional COPCs, NDEA and NMEA, had measured concentrations or DLs less than their corresponding OELs but greater than 10% (see COPCs highlighted in yellow in Table 1). This section provides more detail on these four COPCs, along with plots of the corresponding data. Note that Appendix E shows plots and descriptions for other COPCs with measured inlet or outlet concentrations or DLs between 2% and 10% of their corresponding OELs.

**Ammonia** (see Figure 1) – The DL for ammonia corresponds to approximately 2.5% of its OEL. The inlet concentrations for both cartridges stayed relatively constant, 90% to 106% of the OEL, but each cartridge had decreased values for their corresponding 12-hour samples (42% and 56% of the OEL, respectively). For the SCOTT 7422-SD1 cartridge, the initial outlet ammonia concentrations were below the DL and gradually increased by the end of testing. However, these concentrations still remained below 10% of the OEL through the end of the test period. For the SCOTT 7422-SC1 cartridge, concentrations were also below the DL at the beginning of the test but increased above the DL toward the end of the test, and above 10% of the OEL after 12 hours.



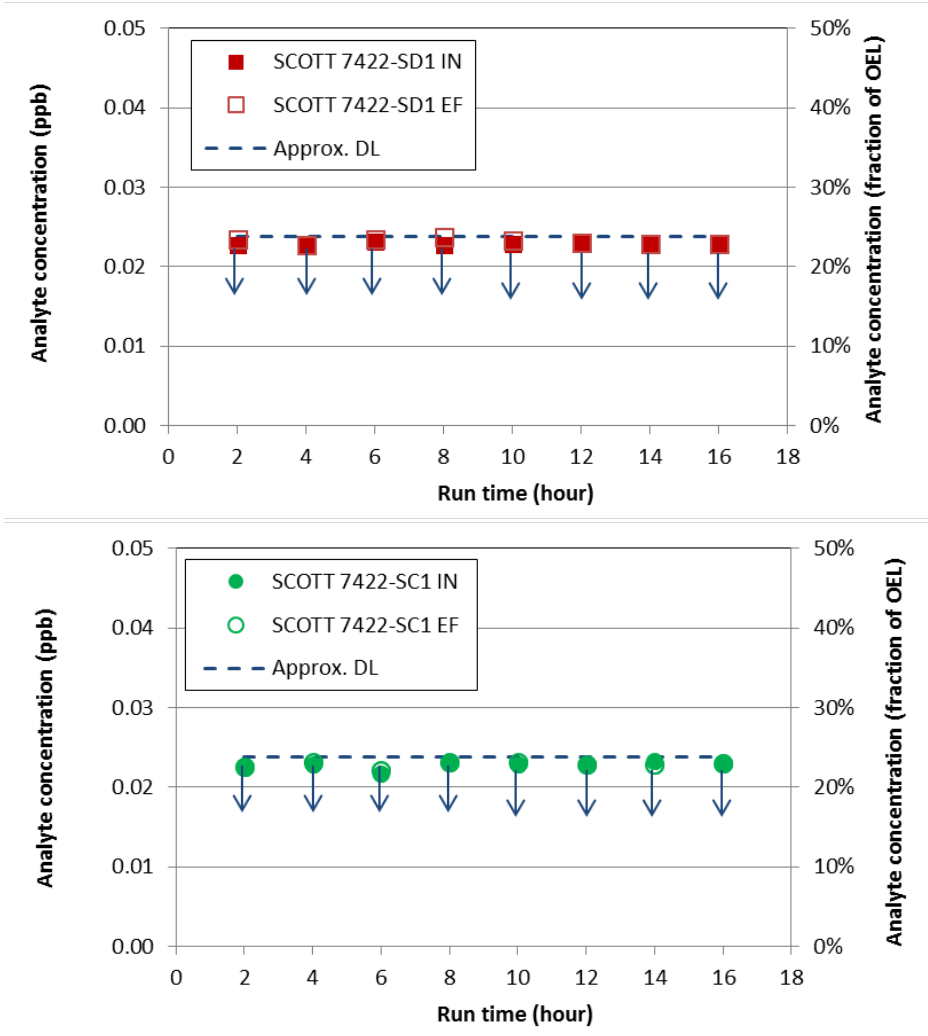
**Figure 1.** Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

*N-Nitrosodimethylamine* (see Figure 2) – The DL for NDMA corresponds to approximately 11% of its OEL. All inlet measurements for both cartridge tests were significantly greater than the DL. Except for one inlet concentration of 576% of OEL after 4-hours for SCOTT 7422-SC1, all other inlet concentrations for both cartridges were relatively constant throughout testing, ranging from 1284% to 1638% of the OEL. All of the outlet measurements were below the analytical DL for both respirator cartridges. Thus, there is no evidence of breakthrough over the measured time period for either cartridge tested.



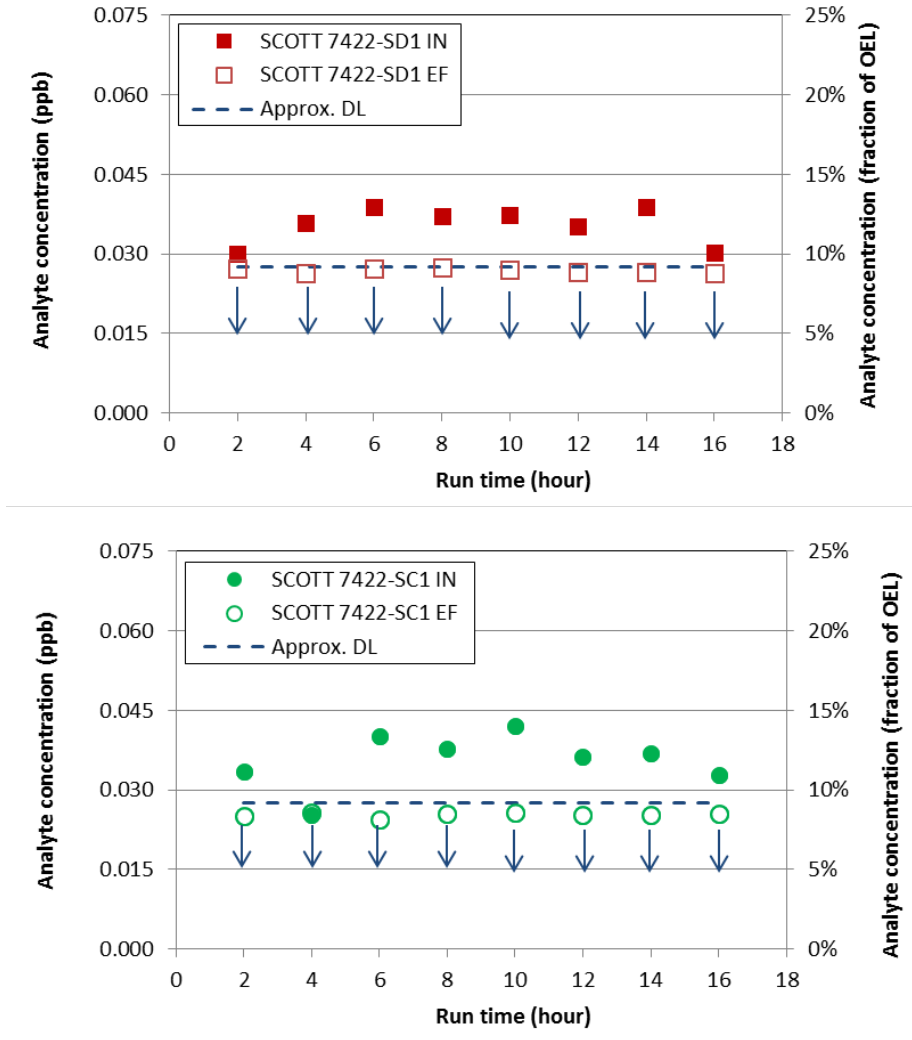
**Figure 2.** Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

*N-Nitrosodiethylamine* (see Figure 3) – The DL for NDEA corresponds to approximately 24% of its OEL. All inlet measurements for both respirator cartridges were less than the DL. All of the respirator outlet measurements also were below detection limits. Even though the DL is greater than 10% of OEL, the outlet measurements do not indicate breakthrough over the measured time period for either cartridge tested.



**Figure 3.** Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

*N-Nitrosomethylethylamine* (see Figure 4) – The DL for NMEA corresponds to approximately 9.2% of its OEL. All inlet measurements for both respirator cartridges were higher than the DL, with most measurements exceeding 10% of the OEL. All of the respirator outlet measurements were below the DL. Therefore, there is no evidence of breakthrough over the measured time period for either cartridge tested.



**Figure 4.** Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

## 6.0 Factoring in Historical Concentration Data

To fully assess respirator performance for COPC removal, historical data were reviewed to determine if the recent inlet measurements were representative of typical values. Historical AW exhauster data from TWINS and the Site-Wide Industrial Hygiene Database were used for this assessment.

A complete table with historical and measured results for all 59 COPCs and their boiling point data is shown in Appendix F, along with a description of the historic source data that were used. Table 2 shows a subset of data for COPCs with boiling points below 70°C because a low boiling point can be a general indicator of poor adsorption on solid media.

In total, 10 COPCs have been previously measured in the AW exhauster stack at concentrations above 10% of their respective OELs and above analytical RLs. These COPCs include ammonia, nitrous oxide, mercury, furan, 2,5-dihydrofuran, ethylamine, NDMA, NDEA, NMEA, and N-Nitrosomorpholine. Of these 10 COPCs:

- Ammonia and NDMA average inlet concentrations measured in this cartridge study were generally consistent<sup>1</sup> with historic exhauster stack measurements. The average inlet concentration for ammonia was approximately 40% less than the historic average, while the NDMA average inlet concentration was 45% higher than historic average. The NDMA maximum inlet concentration (1638% of its OEL) was 24% less than the maximum historic concentration. However, maximum ammonia inlet concentrations were 84% lower (26.5 ppm) compared to the historic AW exhauster stack maxima of 161 ppm.
- The maximum mercury inlet concentration measured in this study (7.3% of the OEL) was substantially lower than both average and maximum historic concentrations of 117% and 1184% of its OEL, respectively.
- Furan and 2,5-dihydrofuran average inlet concentrations from cartridge testing were consistently less than their DLs (approximately 6% and 4% of OEL), while historic concentrations averaged 127% and 58%, respectively. In addition, ethylamine average and maximum cartridge inlet concentrations were less than their RLs (~0.1% of OEL) compared to historic average and maxima of 1.3% and 12%, respectively.

Although NDMA concentrations were generally consistent with historic measurements, average inlet concentrations for other nitrosamines including NDEA, NMEA, and N-Nitrosomorpholine were substantially lower than historic average concentrations. NDEA inlet concentrations were consistently less than the DL (~24% of the OEL), and both NMEA and N-Nitrosomorpholine average inlet concentrations were approximately 70% lower than historic averages.

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<sup>1</sup> Inlet concentrations were considered generally consistent if they were within a factor of 2 (-50% to +100%) of historic maximum or average exhauster stack measurements.

**Table 2.** Historical AW Exhauster Data for COPCs with Boiling Points less than 70°C (158°F)

COPC Number and Name	CAS Number	Boiling Point (°F)	Occupational Exposure Limit (OEL)	Historical Measurements <sup>1</sup>					Measurements in this Study	
				# of Values	Max. Value	Average Value	Max. Value (% OEL)	Average Value (% OEL)	Max Inlet Value (% OEL)	Highest Value from Respirator Outlet (% OEL)
2 Nitrous Oxide	10024-97-2	-127	50 ppm	2 4	11.3 <RL	8 29*	23% <RL	16% 58%*	Not Measured	
1 Ammonia	7664-41-7	-28	25 ppm	25	161	39.5	644%	158%	106%	16.6%
50 2-Fluoropropene	1184-60-7	-11	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	
14 Formaldehyde	50-00-0	-6	0.3 ppm	32	<RL	0.0215*	<RL	7.2%*	2.6%	0.95%
53 Methyl nitrite	624-91-9	10	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	
4 1,3-Butadiene	106-99-0	24	1 ppm	27	<RL	0.0846	<RL	8.5%	2.0% (RL)	2.0 (RL) <sup>2</sup>
42 Ethylamine	75-04-7	62	5 ppm	17	0.609	0.0644*	12%	1.3%*	0.098% (RL)	0.099% (RL)
15 Acetaldehyde	75-07-0	69	25 ppm	17	<RL	0.0774*	<RL	0%*	0.068%	0.047%
19 Furan	110-00-9	88	1 ppb	22	<RL	1.27	<RL	127%	5.7% (DL)	3.9% (DL)
59 Methyl Isocyanate	624-83-9	103	0.02 ppm	1	<RL	<RL	<RL	<RL	Not Detected - TIC	
20 2,3-Dihydrofuran	1191-99-7	130	1 ppb	9	<RL	<RL	<RL	<RL	2.5%	2.1% (DL)
22 2-Methylfuran	534-22-5	147	1 ppb	22	<RL	<RL	<RL	<RL	3.6% (DL)	2.4% (DL)
8 Methanol	67-56-1	148	200 ppm	17	<RL	0.829*	<RL	0.41%*	Not Measured	
21 2,5-Dihydrofuran	1708-29-8	152	1 ppb	22	<RL	0.576*	<RL	58%*	4.3% (DL)	2.9% (DL)

<sup>1</sup> Historical data from TWINS industrial hygiene vapor database and SWIH database; see text for links and dates of queries. Values in italics include those data plus data from the TWINS headspace database, all samples earlier than May 2005.

\* indicates that the value of the average would differ by a factor of 2 or more (in either direction) if non-reports were excluded.

"< RL" indicates that all pertinent measurements of the analyte were less than the reporting level

Plain font in the table indicates that only the recent databases (SWIHD headspace and TWINS Industrial Hygiene) were included.

Italics mean that the pre-2006 TWINS headspace data were also included.

"n/a" indicates no historical data was found in the databases

<sup>2</sup> "(DL)" indicates value represents approximate detection limit (DL), which is calculated using the reported detection limit (or reporting limit - RL, where noted) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.

## 7.0 Conclusions

Testing was conducted during the September 23–25, 2016 period using a slipstream from the exhauster in the Hanford AW tank farm under static conditions. The vapors were fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges SCOTT 7422-SD1 and SCOTT 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were each assessed with the tank farm exhauster vapors in tests conducted on separate days. Sorbent tubes were used to collect samples of the vapor stream entering and exiting the respirator cartridge, and were subsequently analyzed for COPC concentrations. PNNL was tasked to conduct independent analysis of the analytical results, and make recommendations based on the results for respiratory cartridge performance and change-out frequency.

The AW exhauster data are expected to provide conservatively high COPC concentrations compared to the ambient concentrations inside and outside the tank farm. Further, the flow rate through each respirator cartridge was maintained conservatively high compared to normal human breathing rates. The average temperatures of the sample slipstream during testing ranged from 57 to 76°F, and the average relative humidity ranged from 55 to 89%. The inlet concentrations measured are shown in Table 1. Thus, any conclusions on respirator cartridge performance pertain to the above-stated conditions.

The following are the key conclusions from the assessment of the 59 COPCs in the current analysis:

- Based on measured cartridge inlet vapor concentrations from the AW exhauster, only two of the measured COPCs exceeded their corresponding OELs,<sup>1</sup> ammonia and NDMA. One COPC, NMEA, had one or more inlet concentration measurements greater than 10% of its OEL, but less than 100%. N-Nitrosodiethylamine had a DL of approximately 24% of the OEL, but all inlet and outlet measurements were less than the DL. All other COPCs' inlet and outlet measurements did not exceed 10% of their OELs.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 106% of its OEL (26.5 ppm) during testing, which was lower than average (158%) and maximum (644%) historical measurements from the exhauster. The lowest concentration observed was 41.8% of the OEL for the SCOTT 7422-SD1 cartridge for the 12 hour measurement. For the SCOTT 7422-SC1 cartridge, ammonia appeared to break through the cartridge above 10% of the OEL after 12 hours. For the SCOTT 7422-SD1 cartridge, the outlet concentrations were less than the detection limit (DL) initially, began increasing gradually after 12 hours, but remained below 10% of the OEL through the end of the test.
- Cartridge inlet concentration measurements for NDMA reached 1638% of its OEL (4.9 ppb), which was higher than the average (963%) and slightly lower than the maximum (2163%) historical concentration measurements from the exhauster. However, all outlet concentrations were less than the analytical RL of approximately 11% of the OEL, indicating no breakthrough for either cartridge.

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<sup>1</sup> Occupational Exposure Limits accepted for Hanford Tank Farm use are based on OELs established by a U.S. governmental agency or national professional organization (e.g., OSHA, National Institute for Occupational Safety and Health, American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs using non-U.S. exposure limits, other established OELs for chemical surrogates when available, or other standard procedures. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Cartridge inlet concentration measurements for NMEA reached a maximum of 14% of its OEL (0.04 ppb) and average concentration of approximately 12% of OEL. The average concentration was slightly lower than average historical measurements from the exhauster. All outlet concentrations were less than the analytical RL of approximately 9.2% of the OEL, indicating no breakthrough for either cartridge.
- All inlet and outlet concentrations for NDEA were less than the analytical RL of approximately 24% of the OEL, indicating no breakthrough for either cartridge.



## 8.0 Recommendations

- Based on the measurements taken for this study, ammonia breakthrough, above 10% of its OEL, occurred after 12 hours for SCOTT 7422-SC1 cartridge. The average inlet concentration of ammonia was 94% of the OEL. While breakthrough above 10% OEL was not observed for the SCOTT 7422-SD1 cartridge, its outlet concentration measurement were increasing by the end of the test. This experimental result supports a 12-hour service life for the use of SCOTT 7422-SC1 and 7422-SD1 cartridges in APRs employed to protect workers at the Hanford AW tank farm, under the same conditions as those tested. Additional respirator cartridge and respirator selection evaluations by Industrial Hygiene professionals are recommended to determine proper respiratory protection requirements. Variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact the experiment-derived cartridge service life, especially if OEL thresholds are exceeded. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of an appropriate respirator cartridge change-out schedule for adequate worker protection.
- Additional recommendations related to NDMA and NDEA DLs, TICs, further data assessments, and future testing documented in PNNL-25860<sup>1</sup> for respirator cartridge testing on a slipstream from the Hanford AP tank exhauster are also relevant to the AW exhauster. Future testing and multi-tank analysis of cartridge performance with a wider range of COPC concentrations and test conditions should help improve understanding of overall cartridge performance.

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<sup>1</sup> Nune, SK, J Liu, CJ Freeman, and TM Brouns. 2016. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Pacific Northwest National Laboratory, Richland, Washington. (Unpublished)



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## **Appendix A**

### **Description of Respirator Cartridge Testing Setup**



# Appendix A

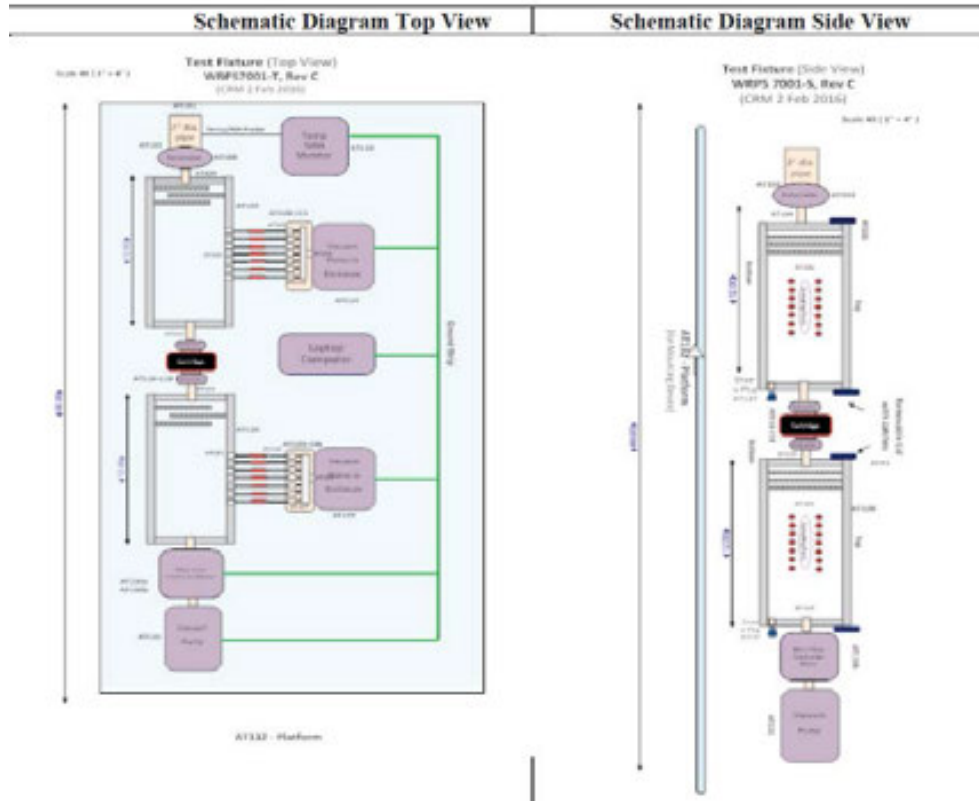
## Description of Respirator Cartridge Testing Setup

The respirator cartridge testing system was developed by Washington River Protection Solutions and HiLine Engineering as a means to comprehensively test respirator cartridge performance with actual Hanford tank headspace gases. The system was designed to draw vapors from a tank or exhauster and flow the vapors through the respirator cartridge being tested.[13,14] The test equipment allows for sampling the vapor stream both before and after the cartridge, so that performance for a given COPC can be quantified. Sorbent media tubes were used to capture the COPCs and other hazardous contaminants. After a given test segment, the sorbent tubes were removed and analyzed. Sampling of the exhaust gas was performed every 2 hours, but this timing can be modified as necessary.

Figure A.1 provides a general schematic diagram for the respirator cartridge test apparatus, and Figure A.2 shows photographs of the actual equipment. The test system operates using vacuum to draw tank gases/vapors into the unit so that the potential for leakage to atmosphere is minimized until the gases/vapors are under positive pressure downstream of the vacuum pumps. By the time gases reach the vacuum pump, the COPCs are essentially captured/removed by either the sorbent tubes or the respirator cartridge.[13,14]

Flows through the respirator cartridge and through each sorbent tube are set and controlled/maintained using manual flow control valves on the outlet of each rotameter, and rotameters were calibrated against DryCal primary flow calibrators before and after testing. All equipment connections were leak tested prior to initiation of the test. Temperature, relative humidity, and pressure of the inlet gas/vapor stream are monitored by calibrated instrumentation.

Using Industrial Hygiene-approved materials, cartridge test equipment was constructed so that it would not influence/interfere with vapor analysis. Stainless steel or Teflon tubing and fittings were incorporated into the design where possible because of their relatively inert nature to the vapors being analyzed. Limited portions of the assembly used acrylic, Viton, glass, and Masterflex C-flex tubing, which are commonly used for various vapor-sampling applications.



**Figure A.1.** General Schematic of Respirator Cartridge Test Apparatus



**Figure A.2.** Photographs of the Respirator Cartridge Test Equipment



**Appendix B**  
**Analytical Testing**



## Appendix B

### Analytical Testing

The Sampling and Analysis Plan was developed under the direction and oversight of the Industrial Hygienist in conjunction with the Tank Farms Operations Contractor Retrieval and Closure, and Tank Farms Project and/or Production Operations Project Management Team.

Chemical compounds in the tank samples were analyzed using approved industrial hygiene methods or National Institute of Occupational Safety and Health-approved methods for quantifying hazardous airborne contaminants in the tank farm vapors. Methods including gas chromatography/mass spectrometry were used as the primary analytical techniques for identifying hazardous airborne contaminants (see Table B.1).

**Table B.1.** Information on Sorbent Media used to Capture Contaminants, Flow Rates Used, Analytical Methods to Extract Analyte from Sorbent Media, and Method Analysis to Quantify or Estimate the Concentrations of Hazardous Contaminant

Analyte	Media	Flow Rate (mL/min)	Analytical Method <sup>a</sup>	Instrument Used <sup>b</sup>	Analysis Location <sup>c</sup>
Acetonitrile	Charcoal Tube, SKC-226-09	100	NIOSH 1606	GC-FID	ALS
Acetonitrile	Carbotrap 300 TDU Tube	33	EPA TO-17 Modified	GC/MS	WRPS
Furans	TDU Tenax TA	33	EPA TO-17 Modified	GC/MS	WRPS
Semivolatile Organic Compounds	Carbotrap 150 TDU Tube	33	EPA TO-17 Modified	GC/MS	WRPS
Volatile Organic Compounds	Carbotrap 300 TDU tube	33	EPA TO-17 Modified	GC/MS	WRPS
Mercury	Anasorb C300, SKC-226-17-1A	250	NIOSH-6009	CVAA	WHL
Ammonia	Anasorb 747 (sulfuric acid), SKC-226-29	200	OSHA-ID-188	IC	WHL
1,3-butadiene	Charcoal, SKC-226-37, (Parts A and B)	200	NIOSH-1024	GC-FID	ALS
Aldehyde	DNPH Treated Silica Gel, SKC-226-119	200	EPA TO-11A	HPLC	ALS
Pyridine	Coconut Shell Charcoal, SKC-226-01 offsite	1000	NIOSH-1613	GC-FID	ALS

Analyte	Media	Flow Rate (mL/min)	Analytical Method <sup>a</sup>	Instrument Used <sup>b</sup>	Analysis Location <sup>c</sup>
Nitrosamines	Thermosorb/N	2000	NIOSH-2522 Modified	GC-TEA	CBAL
Ethylamine	XAD-7 (NBD) Chloride), SKC 226-96	200	OSHA-ID-34, 36, 40, and 41	HPLC-UV	ALS

<sup>a</sup> Analytical Method

NIOSH: National Institute of Occupation Safety and Health

EPA: U.S. Environmental Protection Agency

OSHA: Occupational Safety and Health Administration

<sup>b</sup> Instrument Used

GC-FID: Gas Chromatography-Flame Ionization Detector

GC/MS: Gas Chromatography-Mass Spectrometry

CVAA: Cold Vapor Atomic Absorption

IC: Ion Chromatography

HPLC: High Performance Liquid Chromatography

GC-TEA: Gas Chromatography-Thermal Energy Analyzer

HPLC-UV: High Performance Liquid Chromatography-Ultraviolet Detector

<sup>c</sup> Analysis Location

ALS: ALS Environmental Salt Lake City

WRPS-222S: Washington River Protection Solutions, Organic Studies Group

WHL-222S: Wastren Hanford Laboratory

CBAL: Columbia Basin Analytical Laboratory, part of the RJ Lee Group

## **Appendix C**

### **Raw Analytical Data**



# Appendix C

## Raw Analytical Data

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## Description

This appendix includes raw data of flow rate, temperature, pressure, and humidity, and analytical data for the AW data set. Calculations using this data are given in Appendix D.

The raw analytical data is only given in this appendix. Washington River Protection Solutions (WRPS) converted these data into Excel data spreadsheets that were transmitted to Pacific Northwest National Laboratory. Comments on that conversion are provided below.

The analytical measurement results listed in results spreadsheet columns were transferred from entries labeled 'result' in the raw analytical .pdf files. The results were transferred into three rows in the spreadsheets. The first row contained the relevant information with the appropriate units. Where a results entry was given as 'ND' in the .pdf, a '<' symbol was used. Where a detection/reporting limit (RL) was listed as 'n/a,' the result entry in the spreadsheet was given as '0.0.'

The use of the RL or detection limit (DL) varied among analytical laboratories. The term RL (equivalent to a limit of quantification) was used instead of a DL by ALS Environmental Salt Lake City, Columbia Basin Analytical Laboratory, and 222S–Wastren Hanford Laboratory (see Table F.1 in Appendix F for a complete correlation of which Chemicals of Potential Concern used an RL or a DL). The WRPS laboratory provided a DL, in contrast to an RL. Neither RLs nor DLs were provided for tentatively identified compounds (TICs).

Chain of custody information is provided clearly in the raw analytical data .pdf files, including analyte name, sample numbers, and laboratory-assigned numbers. Chemical Abstract Service numbers were not provided.

The nomenclature of the sample identification (ID) is the same for every set of chemicals. It is generally composed of a survey number, tank farm ID, test location, sample line, and tube bundle ID. Descriptions of these nomenclatures are given as follows:

'BLANK' means measurements obtained from sorbent tubes that have not had any vapor stream passed through them. 'BASE' means measurements obtained for ambient air (fresh air vs. tank vapor) running through the test system before initiation of tank vapor testing.

'8635' designations correspond to testing with the SCOTT 7422-SD1 respirator cartridge, whereas '8636' designations correspond to testing with the SCOTT 7422-SC1 respirator cartridge.

Position designations 'IN-A' and 'EFF-A' correspond to the respirator cartridge inlet and outlet measurements, respectively, at the 0- to 2-hour time intervals. Position designations 'B' through 'H' correspond to the subsequent 2-hour measurements for inlet (IN) and outlet (EFF): IN-B/EFF-B (2 to 4 hours), IN-C/ EFF-C (4 to 6 hours), IN-D/ EFF-D (6 to 8 hours), IN-E/ EFF-E (8 to 10 hours), IN-F/ EFF-F (10 to 12 hours), IN-G/ EFF-G (12 to 14 hours), and IN-H/ EFF-H (14 to 16 hours).

The sample IDs embed the information given above. For example, sample ID 16-08635-5-IN-A corresponds to the first cartridge survey (16-08635), sample line 5, and the first (0 to 2 hours) influent sample bundle (IN-A).

The flow rate passing through the respirator cartridge was approximately 30 L/min, while the sampling flow rates through the sorption tubes ranged between 30 and 200 mL/min for different chemicals that were being collected. WRPS provided these flow rates in files 'AW Exhauster Flow Rate 9-23-2016.xlsx' for the first survey with SCOTT 7422-SD1 and 'AW Exhauster Flow Rate 9-24-2016.xlsx' for the second



survey with SCOTT 7422-SC1. The information is shown in the tables below. Columns labeled Mach. Base 1 and Mach. Base 2 refer to the 'BASE' baseline samples for influent and effluent, respectively, to verify machine cleanliness prior to experimental measurements.

WRPS provided the temperature and humidity information in files 'AW Exhauster DRI 9-23-2016.xls' and 'AW Exhauster DRI 9-24-2016.xls.' The information is shown in the tables provided in this appendix. Several terms used in the DRI files are described below.

- 'Pre' and 'Post' indicate the general time signature when the direct read instrument measurements were taken. 'Pre' refers to the beginning of the 2-hour sample duration, and 'Post' refers to the end of the 2-hour sample duration.
- 'Influent' and 'Effluent' indicate the location of the measurement within the test system. 'Influent' measurements are taken at the inlet of the system upstream of the respirator cartridge. 'Effluent' measurements are taken downstream of the respirator cartridge. The pressure, temperature, and humidity effluent sensors are located at the end of the test system near the vacuum pump, whereas the DRI measurements for ammonia and volatile organic compounds are from a sampling location between the respirator cartridge and the effluent sorbent tube samples.
- The DRI measurements for ammonia and volatile organic compounds could not be taken while the test system sample pumps were operational. 'After Sample Taken' refers to the time signature for these direct read results (e.g., Sample A DRI measurements were taken immediately after the Sample A sorbent tubes were taken and replaced with Sample B sorbent tubes).

The raw analytical data for chemicals in each category are summarized together. Examples of chemicals in each category follow:

- SVOC (or SVOA): Biphenyl, Diethylphthalate, Tributyl phosphate, Dibutyl butylphosphonate, Dodecane, Hexadecane
- SVOCTIC (or SVOATIC): Undecane, Cyclotetrasiloxane, octamethyl, Decamethylcyclopentasiloxane, Dodecane,4,6-dimethyl
- VOC (or VOA): Acetone, Acetonitrile, Acetophenone, Benzene, Butanal,1-Butanol, Butanenitrile, 3-Buten-2-one, Cyclohexane, Decane, Ethanol, Ethylbenzene, Furan, Hexane, Hexanone, Methylene Chloride, Propanenitrile, Styrene, Tetrachloroethene, Toluene, Trichlorofluoromethane
- VOCTIC (or VOATIC): 2,6-Dimethyldecane, Decane, 2,3,5,8-tetramethyl-, Decane, 3,7-dimethyl-, Methenamine, Undecane, 2,6-dimethyl-
- Furans: 2,3-Dihydrofuran, 2-Pentyfuran, Furan, Tetrafulan
- Ethylamine (amines): Dimethylamine, Ethylamine, Methylamine
- Acetonitrile: Acetonitrile
- Mercury: Mercury
- Ammonia: Ammonia
- Aldehyde: Acetaldehyde, Acetone, Butyraldehyde. Formaldehyde, Hexanal, Propionaldehyde, Valeraldehyde
- 1,3 Butadiene: 1,3-Butadiene
- Pyridines: 2,4-Dimethylpyridine, Pyridine
- Nitrosamines: N-Nitrosodimethylamine.

SCOTT 7422-SD1 Cartridge (9/23/16 to 9/24/16) AW Exhauster

Volumes Air Collected (L)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	3.92	4.07	4.03	4.07	3.88	4.01	3.96	4.00	3.97	3.95	3.85	4.00	3.85	2.32	4.22	4.51	4.12	4.22
VOC	B	4.12	3.92	4.23	3.99	4.24	4.11	3.80	3.80	3.86	3.55	3.85	3.79	3.85	3.85	4.04	3.81	4.01	3.82
Furans	C	4.11	6.22	4.11	6.43	4.21	6.63	4.03	6.40	4.10	6.26	3.92	6.02	3.86	5.80	3.99	6.31	4.01	6.24
Ethylamine	D	12.4	12.8	12.4	13.1	12.6	12.2	12.5	12.3	12.2	12.0	11.9	11.8	11.6	11.7	12.0	11.7	12.0	11.7
Acetonitrile	E	11.7	12.9	11.8	13.0	12.1	12.3	12.1	12.3	12.2	12.3	11.9	11.6	11.6	12.2	11.9	11.9	11.8	12.0
Mercury	F	29.6	30.9	30.6	31.1	29.5	30.6	29.8	30.0	30.1	30.5	29.9	29.3	30.1	30.0	30.1	30.3	29.4	30.0
Ammonia	G	24.6	25.0	24.7	25.5	24.9	24.8	24.3	24.2	24.0	24.0	23.6	23.9	24.4	23.5	24.3	24.5	24.2	24.9
Aldehyde	H	25.0	24.9	25.1	25.3	24.9	24.6	23.8	23.6	24.1	23.5	23.8	24.2	24.0	24.1	23.9	24.6	23.9	23.9
1,3-Butadiene	I	24.8	23.1	24.3	24.1	24.1	24.2	24.3	24.4	24.3	24.5	23.8	23.7	23.6	23.6	23.8	24.1	23.7	23.9
Pyridine	J	123	124	122	125	124	125	124	125	122	126	124	127	122	127	122	125	122	127
Nitrosamines	K	239	241	242	236	244	245	241	239	244	235	240	238	235	238	234	238	235	238

Flow Rates (ml/min)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	32.6	33.9	33.6	34.0	32.3	33.4	33.0	33.3	33.0	32.9	32.1	33.3	32.1	19.4	35.2	37.6	34.3	35.2
VOC	B	34.3	32.7	35.2	33.3	35.3	34.3	31.7	31.7	32.2	29.6	32.1	31.6	32.1	32.1	33.7	31.8	33.4	31.8
Furans	C	34.3	51.9	34.3	53.6	35.1	55.3	33.6	53.3	34.1	52.2	32.7	50.1	32.2	48.4	33.3	52.6	33.4	52.0
Ethylamine	D	103	107	104	109	105	102	104	104	102	102	99.7	99.3	98.7	96.6	97.7	100	97.7	99.7
Acetonitrile	E	97.6	107	98	108	101	103	101	102	102	103	99.2	96.9	96.4	101	99.2	99.3	98.3	99.9
Mercury	F	247	258	255	259	246	255	249	250	251	254	249	245	251	250	251	253	245	250
Ammonia	G	205	209	206	213	208	207	202	201	200	200	197	199	203	196	202	204	201	208
Aldehyde	H	208	208	209	211	207	205	198	197	201	196	198	201	200	201	199	205	199	199
1,3-Butadiene	I	207	192	202	201	201	202	202	203	203	204	198	197	196	197	198	201	198	200
Pyridine	J	1025	1035	1020	1040	1036	1043	1035	1040	1020	1050	1030	1055	1020	1055	1020	1045	1015	1060
Nitrosamines	K	1995	2005	2015	1970	2031	2045	2005	1990	2030	1960	2000	1980	1960	1980	1950	1980	1955	1980

Data points highlighted in yellow were identified by the test operator as being low/ suspect due to media tube issues.

SCOTT 7422-SC1 Cartridge (9/24/16) AW Exhauster

Volumes Air Collected (L)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	3.85	3.82	4.07	3.79	4.22	3.83	4.17	4.13	3.84	3.80	3.81	4.15	4.03	4.27	4.11	4.24	4.09	4.22
VOC	B	3.84	3.86	3.74	4.03	4.04	4.12	4.19	4.34	3.77	3.91	3.94	3.75	3.86	3.89	4.00	4.05	3.86	4.04
Furans	C	3.83	6.57	3.95	6.53	4.10	5.84	4.41	6.28	3.94	5.68	3.83	5.52	3.71	5.59	3.97	6.27	4.15	5.97
Ethylamine	D	12.8	12.7	12.5	12.3	12.9	12.6	12.9	13.5	11.4	12.2	11.3	11.8	11.1	11.4	11.9	11.1	11.8	11.9
Acetonitrile	E	12.9	12.8	12.9	12.6	12.4	12.9	13.3	13.8	12.0	12.4	11.6	11.5	11.3	11.2	11.6	11.6	11.6	11.3
Mercury	F	29.4	31.6	31.0	30.1	29.7	21.1	31.3	31.5	29.3	30.4	29.2	29.5	28.5	28.5	29.6	29.1	29.7	29.2
Ammonia	G	24.1	25.0	24.6	23.9	24.9	27.5	26.5	26.6	24.3	24.2	23.9	23.6	23.5	22.7	23.6	22.3	23.5	23.3
Aldehyde	H	24.2	24.6	24.6	24.3	24.0	24.6	25.9	26.6	23.3	24.2	22.5	24.0	22.5	23.6	24.1	23.1	24.3	23.1
1,3-Butadiene	I	23.4	24.3	24.0	24.6	24.3	24.5	26.1	26.2	23.6	23.3	23.1	23.0	22.7	23.2	23.3	22.6	23.4	24.0
Pyridine	J	125	124	127	122	125	124	136	130	123	119	122	119	121	117	122	118	122	120
Nitrosamines	K	243	243	244	245	241	239	255	253	238	240	238	236	236	239	230	238	232	236

Flow Rates (ml/min)

Sample Box Number	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
Analyte	Line	Base 1	Base 2																
SVOC	A	32.1	31.8	34.0	31.5	35.2	31.9	32.1	31.8	32.0	31.7	31.8	34.6	33.6	35.6	34.2	35.3	34.1	35.2
VOC	B	32.0	32.1	31.1	33.6	33.6	34.4	32.2	33.4	31.4	32.5	32.9	31.2	32.2	32.4	33.4	33.8	32.1	33.7
Furans	C	32.0	54.8	32.9	54.5	34.1	48.6	33.9	48.3	32.8	47.3	31.9	46.0	31.0	46.6	33.1	52.2	34.6	49.8
Ethylamine	D	106	106	104	102	108	105	99	104	95.3	102	94.0	98.4	92.4	95.3	99.1	92.4	98.4	99.4
Acetonitrile	E	108	107	108	105	104	108	103	106	100	103	97.0	95.8	94.6	93	96.7	96.6	96.5	93.8
Mercury	F	245	263	258	250	248	176	241	242	244	253	243	246	238	238	247	243	248	243
Ammonia	G	200	208	205	199	207	229	204	205	203	202	199	196	189	196	185	195	195	194
Aldehyde	H	201	205	205	202	200	205	199	205	194	202	187	200	187	197	201	192	203	192
1,3-Butadiene	I	195	202	200	205	202	204	201	201	197	194	193	192	189	193	194	189	195	200
Pyridine	J	1045	1035	1055	1015	1045	1030	1045	1000	1025	995	1020	988	1010	975	1020	985	1020	1000
Nitrosamines	K	2025	2025	2030	2045	2005	1995	1960	1945	1980	2000	1985	1970	1965	1990	1920	1980	1935	1965

SCOTT 7422-SD1 Cartridge (9/23/16 to 9/24/16) AW Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	57.9	83.5	69.4	67.2	64.9	68.5	82.2	84.8	79.5
Temperature	F	57.8	64	70.2	71.2	72.9	69.8	61.4	59.5	58.2
Pressure	Torr	737	733	733	733	733	734	735	736	737
NH3	ppm									
VOC	ppm									

Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	53.4	69.1	65.5	63.4	65.8	80	83.8	79.6	75.4
Temperature	F	62.8	70.9	71.9	73.6	69.8	62.9	59.9	58	58.7
Pressure	Torr	737	733	733	733	734	734	736	737	738
NH3	ppm		24.0	18.0	24.0					
VOC	ppm		0.50	0.00	0.08					

Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	30.0	33.7	32.7	33.0	32.4	31.0	37.7	40.0	38.0
Temperature	F	58.6	63.9	70.6	71	73.5	71.7	63.2	60.7	59.7
Pressure	Torr	421.4	426	434	435	436	429	435	439	436
NH3	ppm									
VOC	ppm									

Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	29.5	34.1	32.6	33.2	31	36.6	40.3	39.4	38.7
Temperature	F	63.5	71.2	72.1	73.4	71.7	65.9	62	60.0	59.6
Pressure	Torr	431	437	438	441	429	441	440	439	441
NH3	ppm		0.00	0.00	0.00					
VOC	ppm		0.00	0.00	0.00					

SCOTT 7422-SC1 Cartridge (9/24/16) AW Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	64.2	83.5	76.7	57.8	60.4	74.7	79.5	85.4	89.4
Temperature	F	66.1	70.1	74.4	76.2	73.3	65.8	63.0	60.7	56.6
Pressure	Torr	743	739	739	738	736	736	738	736	736
NH3	ppm									
VOC	ppm									

Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	61.5	73.4	54.9	59.9	72.1	81.1	83.9	85.4	82.5
Temperature	F	68.2	75.6	70.0	74.9	66.4	63.1	61.0	56.5	58.5
Pressure	Torr	744	739	738	738	737	737	738	737	737
NH3	ppm		21.0	28.0	21.0				2.00	2.00
VOC	ppm		0.81	0.89	0.00				1.60	1.60

Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	31.3	33.8	33.4	27.3	28.6	31.0	36.1	39.1	42.5
Temperature	F	65.2	70.8	75.5	78.5	73.9	69.7	64.6	61.8	58.3
Pressure	Torr	453	448	439	455	458	453	444	447	435
NH3	ppm									
VOC	ppm									

Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	28.7	33.7	28.1	28.3	30.8	37.1	39.9	41.6	42.2
Temperature	F	68.9	78.1	79.1	77.9	71.1	65.4	62.6	59.5	59.9
Pressure	Torr	456	457	459	460	457	456	456	455	454
NH3	ppm		0.00	0.00	1.00				0.00	0.00
VOC	ppm		0.00	0.00	0.12				0.35	0.35

*Quantum*  
 11/8/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-06635-1-EFF-A  
 Customer Sample ID: 16-06635-1-EFF-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034222			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034222			95-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034222			108-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034222			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034222			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034222			84-86-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034222			112-40-3	Dodecane	NGS	96	<0.60	13	n/a	n/a	n/a	n/a	0.55	n/a	U
S16T034222			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034222			529-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034222			126-73-8	Tributyl phosphite	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034222			529-50-5	Tridecane	NGS	95	<1.6	6.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034222			529-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034222			529-62-8	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162952

SDG Number:

Customer Sample ID: 16-08635-1-EFF-B

Customer Sample ID: 16-08635-1-EFF-B

Sample#	R	AM	CAS #	SYCIA #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	DM Limit	Cnt Err %	Qual Flags
VAPOR-TDU SYCIA #																
S16T034223			3801-99-3		2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034223			95-48-7		2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034223			108-39-4M		Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034223			92-52-4		Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034223			78-48-6		Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034223			94-66-2		Diethylthiuraz	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034223			112-40-3		Dodecane	NGS	96	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034223			544-76-3		Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034223			629-59-4		Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034223			126-73-8		Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034223			629-50-5		Tridecane	NGS	96	<1.6	8.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034223			629-76-7		Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034223			629-62-9		Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

T - Tentatively Identified Compound  
 U - Less Than Detection Limit  
 N - Nearst TIC  
 NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-EFF-C

Customer Sample ID: 16-08635-1-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cat Em %	Qual Flags
VAPOR-TDU SYDA #2															
S161034224			3891-99-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S161034224			55-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S161034224			108-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034224			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S161034224			78-48-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S161034224			84-68-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S161034224			112-40-3	Dodecane	NGS	96	<0.60	21	n/a	n/a	n/a	n/a	0.55	n/a	
S161034224			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S161034224			829-39-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S161034224			126-73-8	Tributyl phosphate	NGS	88	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034224			829-50-5	Tridecane	NGS	96	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S161034224			829-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S161034224			829-62-9	Pentadecane	NGS	120	<3.0	3.3	n/a	n/a	n/a	n/a	3.0	n/a	J

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162982  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-D  
 Customer Sample ID: 16-08635-1-EFF-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	DM Limit	Cat Err %	Qual Flags
VAPOR-TDU SVQA #2															
S16T034225			3891-99-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034225			95-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034225			108-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034225			82-62-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034225			78-48-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034225			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034225			112-40-3	Dodecane	NGS	96	<0.60	10	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034225			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034225			829-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034225			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034225			829-50-5	Tridecane	NGS	96	<1.6	6.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034225			829-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034225			829-62-0	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-E  
 Customer Sample ID: 16-08635-1-EFF-E

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOR #2															
S16T034226			3891-98-3	2,6,10-Trinitryldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
S16T034226			95-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a,U
S16T034226			108-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a,U
S16T034226			92-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a,U
S16T034226			78-45-5	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a,U
S16T034226			54-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a,U
S16T034226			112-40-3	Dodecane	NGS	96	<0.60	0.8	n/a	n/a	n/a	n/a	0.55		n/a,J
S16T034226			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
S16T034226			829-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,U
S16T034226			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a,U
S16T034226			829-50-5	Tridocane	NGS	96	<1.6	5.8	n/a	n/a	n/a	n/a	1.6		n/a,U
S16T034226			829-75-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
S16T034226			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - N-ated TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-F  
 Customer Sample ID: 16-08635-1-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Res:it	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVDA #2															
S16T034227			3391-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034227			85-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	J
S16T034227			108-39-4M	Cresol (m & p)	NGS	90	<5.5	<5.5	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T034227			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	J
S16T034227			78-48-6	Diethyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	J
S16T034227			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	J
S16T034227			112-40-3	Dodecane	NGS	96	<0.60	7.5	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034227			544-76-3	Heptadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T034227			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034227			128-73-8	Tributyl phosphite	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T034227			629-50-5	Tridecane	NGS	96	<1.6	3.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034227			629-76-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T034227			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J

NA = Not Analyzed, ND = Not Detected  
 J = Estimated

N = Named TIC

U = Less Than Detection Limit

T = Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-G  
 Customer Sample ID: 16-08635-1-EFF-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034228			3681-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034228			95-45-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034228			106-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034228			32-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034228			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034228			34-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034228			112-40-3	Dodecane	NGS	96	<0.80	33	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034228			344-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034228			329-36-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034228			126-73-8	Tributyl phosphata	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034228			329-50-5	Tridecane	NGS	96	<1.6	5.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034228			329-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034228			329-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-H  
 Customer Sample ID: 16-08635-1-EFF-H

Sampled	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034229			3691-66-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034229			95-49-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034229			108-39-6M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034229			92-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034229			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034229			94-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034229			112-46-3	Dodecane	NGS	96	<0.60	11	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034229			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034229			529-09-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034229			126-73-8	Triethyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034229			529-50-5	Tridecane	NGS	96	<1.6	5.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034229			529-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034229			529-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-IN-A

Customer Sample ID: 16-08635-1-IN-A

Sampled	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S161034230			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<-3.9	<-3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S161034230			95-49-7	2-Methylphenol	NGS	96	<-4.9	<-4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S161034230			108-39-4M	Cresol (m & p)	NGS	90	<-5.6	<-5.6	n/a	n/a	n/a	n/a	5.5		n/a U
S161034230			92-52-4	Biphenyl	NGS	100	<-4.0	<-4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S161034230			78-46-6	Dibutyl butylphosphonate	NGS	120	<-3.6	<-3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S161034230			94-66-2	Diethylthiolute	NGS	110	<-7.0	<-7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S161034230			112-40-3	Dodecane	NGS	96	<-0.60	10	n/a	n/a	n/a	n/a	0.55		n/a
S161034230			544-76-3	Hexadecane-	NGS	120	<-3.3	<-3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S161034230			629-56-4	Tetradecane	NGS	110	<-3.9	<-3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S161034230			126-73-8	Tributyl phosphate	NGS	86	<-5.6	<-5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S161034230			629-50-5	Tridecane	NGS	96	<-1.6	6.3	n/a	n/a	n/a	n/a	1.6		n/a J
S161034230			629-78-7	Heptadecane	NGS	100	<-2.4	<-2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S161034230			629-62-0	Pentadecane	NGS	120	<-3.0	<-3.0	n/a	n/a	n/a	n/a	3.0		n/a U

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-IN-H  
 Customer Sample ID: 16-08635-1-IN-H

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU SVQA #2															
S161034231			3881-88-3	2,6,10-Trimethyldecane	NGS	100	<-3.9	<-3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S161034231			95-48-7	2-Methylphenol	NGS	98	<-4.9	<-4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S161034231			108-39-4M	Cresol (m & p)	NGS	90	<-5.6	<-5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S161034231			82-52-4	Biphenyl	NGS	100	<-4.0	<-4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S161034231			78-48-6	Diethyl butylphosphonate	NGS	120	<-3.6	<-3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S161034231			84-86-2	Diethylphthalate	NGS	110	<-7.0	<-7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S161034231			112-40-3	Dodecane	NGS	96	<-0.60	15	n/a	n/a	n/a	n/a	0.55		n/a
S161034231			544-76-3	Hexadecane-	NGS	120	<-3.3	<-3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S161034231			828-59-4	Tetradecane	NGS	110	<-3.9	<-3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S161034231			126-73-8	Triethyl phosphate	NGS	86	<-5.8	<-5.8	n/a	n/a	n/a	n/a	5.8		n/a U
S161034231			629-50-5	Tridecane	NGS	98	<-1.8	9.7	n/a	n/a	n/a	n/a	1.6		n/a J
S161034231			828-76-7	Heptadecane	NGS	100	<-2.4	<-2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S161034231			828-62-8	Pentadecane	NGS	120	<-3.0	<-3.0	n/a	n/a	n/a	n/a	3.0		n/a U

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 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

*Quantum Design*  
 11/18/16

**Cartridge Evaluation  
 Data Summary Report**

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-EFF-A

Customer Sample ID: 16-08635-1-EFF-A

Sample#	R	AM	OC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SYCA #2									
S16T034222				Cyclohexasiloxane, octamethyl	556-87-2	4.35	NGS	55	JNT
S16T034222				Undecane	1120-21-4	5.09	NGS	5.0	JNT
S16T034222				Decane, 2,4,6-trimethyl-	52108-27-4	5.44	NGS	24	JNT
S16T034222				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	52	JNT
S16T034222				1,2-Benzisothiazole	272-16-2	6.59	NGS	30	JNT
S16T034222				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	17	JNT
S16T034222				Undecane, 2-methyl-	7045-71-8	7.26	NGS	18	JNT
S16T034222			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034222			BLNK	Perylene-D12	1320-96-3	15.80	NGS	3.9	

T - Tentatively Identified Compound

U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-EFF-B

Customer Sample ID: 16-08635-1-EFF-B

Sample#	R	Ad	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR:TDU SVOA #2									
S16T034223				Cyclohexasiloxane, octamethyl	556-67-2	4.35	NGS	51	JNT
S16T034223				Decane, 2,4,6-trimethyl-	52108-27-4	5.04	NGS	17	JNT
S16T034223				Acetophenone	96-85-2	5.18	NGS	5.3	JNT
S16T034223				Undecane	1120-21-4	5.44	NGS	30	JNT
S16T034223				Undecane, 2,6-dimethyl-	17301-23-4	5.50	NGS	18	JNT
S16T034223				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	55	JNT
S16T034223				1,2-Benzisothiazole	272-16-2	6.59	NGS	34	JNT
S16T034223				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	20	JNT
S16T034223				Undecane, 2-methyl-	7045-71-6	7.29	NGS	21	JNT
S16T034223			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034223			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.9	

T - Tentatively Identified Compound

U - Less Than Detection Limit

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 J - Estimated



**Cartridge Evaluation  
 Data Summary Report**

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-C  
 Customer Sample ID: 16-08635-1-EFF-C

Sample#	R	AS	OC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SYDA.#2									
S16T034224				Cyclotrisiloxane, octamethyl	556-87-2	4.35	NGS	45	JNT
S16T034224				Acetophenone	98-86-2	5.18	NGS	5.0	JNT
S16T034224				Undecane	1120-21-4	5.45	NGS	26	JNT
S16T034224				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	59	JNT
S16T034224				1,2-Benzisothiazole	272-16-2	6.59	NGS	36	JNT
S16T034224				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	22	JNT
S16T034224				Decane, 2,4,5-trimethyl-	82108-27-4	7.33	NGS	7.7	JNT
S16T034224				Propionic acid, 2-methyl-, 1-	74381-40-1	9.18	NGS	33	JNT
S16T034224			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034224			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.0	

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-D  
 Customer Sample ID: 16-08635-1-EFF-D

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-IDU SVQA #2									
S16T034225				Cycloletrastilovans, octamidyl	556-87-2	4.35	NGS	38	JNT
S16T034225				Undecane	1120-21-4	5.44	NGS	17	JNT
S16T034225				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	58	JNT
S16T034225				1,2-Benzisothiazole	272-16-2	6.59	NGS	32	JNT
S16T034225				Decisicane, 2,6,11-trimethyl-	31255-56-4	6.89	NGS	17	JNT
S16T034225			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034225			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.0	

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-06635-1-EFF-E

Customer Sample ID: 16-06635-1-EFF-E

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVQA #2									
S16T034226				Cydotris/oxane, hexamethyl-	541-05-9	2.85	NGS	35	JNT
S16T034226				Cyclohexisoxane, octamethyl-	556-67-2	4.35	NGS	52	JNT
S16T034226				Decane, 2,4,6-trimethyl-	62108-27-4	5.44	NGS	15	JNT
S16T034226				Decamethylcyclohexisoxane	541-02-6	5.71	NGS	46	JNT
S16T034226				Undecane, 2,6-dimethyl-	17301-23-4	6.29	NGS	9.9	JNT
S16T034226				1,2-Benzisothiazole	272-16-2	6.59	NGS	27	JNT
S16T034226				Dodecane, 2,6,11-trimethyl-	31295-56-4	8.89	NGS	14	JNT
S16T034226				Undecane, 2-methyl-	7045-71-8	7.25	NGS	15	JNT
S16T034226			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034226			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.9	

NA = Not Analyzed, ND = Not Detected  
 J - Estimated

N - Named TIC

U - Less Than Detection Limit

T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-F  
 Customer Sample ID: 16-08635-1-EFF-F

Sample#	R	Ad	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034227				Undecane	1120-21-4	5.44	NGS	15	JNT
S16T034227				Decamethylcyclopentacosane	541-02-6	5.71	NGS	27	JNT
S16T034227				Decane, 2,4,6-trimethyl-	52105-27-4	6.89	NGS	7.1	JNT
S16T034227			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034227			BLNK	Perylene-D12	1520-56-3	15.80	NGS	3.9	

T - Tentatively Identified Compound  
 U - Less Than Detection Limit  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-06635-1-EFF-G  
 Customer Sample ID: 16-06635-1-EFF-G

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVQA #2									
S16T034228				Cyclotrisiloxane, octamethyl	556-67-2	4.36	NGS	120	JNT
S16T034228				D-Limonene	5989-27-5	4.86	NGS	26	JNT
S16T034228				Undecane	1120-21-4	5.06	NGS	120	JNT
S16T034228				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	54	JNT
S16T034228				Undecane, 2,6-dimethyl-	17301-23-4	5.14	NGS	16	JNT
S16T034228				Acetic acid, trifluoro-, 3,7-d	28745-07-5	5.24	NGS	26	JNT
S16T034228				2,3-Dimethyldecane	17312-44-6	5.39	NGS	34	JNT
S16T034228				Undecane, 4,7-dimethyl-	17301-32-5	5.46	NGS	160	JNT
S16T034228				Undecane, 4,6-dimethyl-	17312-62-2	5.50	NGS	42	JNT
S16T034228				Decamethylcyclopentisiloxane	541-02-6	5.72	NGS	75	JNT
S16T034228				Undecane, 3-methyl-	1002-43-3	6.05	NGS	9.1	JNT
S16T034228				Dodecane, 2,7,10-trimethyl-	74645-99-0	6.90	NGS	34	JNT
S16T034228				Tridecane, 2-methyl-	1560-96-9	7.07	NGS	16	JNT
S16T034228				Undecane, 3,7-dimethyl-	17301-29-0	7.26	NGS	20	JNT
S16T034228				Undecane, 2-methyl-	7045-71-8	7.33	NGS	13	JNT
S16T034228			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034228			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.9	

T - Tentatively Identified Compound

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N - Named TIC

NA = Not Analyzed, ND = Not Detected  
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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992  
 SDG Number:  
 Customer Sample ID: 16-08635-1-EFF-H  
 Customer Sample ID: 16-08635-1-EFF-H

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOW #2									
S16T034229				Cyclotrisiloxane, octamethyl	55-6-67-2	4.35	NGS	34	JNT
S16T034229				Decane, 2,4,6-trimethyl-	82105-27-4	5.05	NGS	11	JNT
S16T034229				Undecane	1120-21-4	5.44	NGS	22	JNT
S16T034229				Dodecamethylcyclopentasiloxane	541-02-6	5.71	NGS	36	JNT
S16T034229				Undecane, 2-methyl-	7045-71-8	7.25	NGS	13	JNT
S16T034229			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034229			BLNK	Perylene-D12	1520-95-3	15.80	NGS	3.9	

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-IN-A  
 Customer Sample ID: 16-08635-1-IN-A

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVON #2									
S16T034230				2-Butoxyethanol	111-76-2	3.70	NGS	21	JNT
S16T034230				Cyclohexanone, octamethyl	555-67-2	4.35	NGS	93	JNT
S16T034230				2,2,7,7-Tetramethyloctane	1071-31-4	4.49	NGS	110	JNT
S16T034230				Decane, 2,5,8-trimethyl-	62105-22-9	4.75	NGS	31	JNT
S16T034230				2,2,4,4-Tetramethyldecane	62183-79-3	4.82	NGS	36	JNT
S16T034230				3,3-Dimethylhexane	563-16-6	4.88	NGS	120	JNT
S16T034230				Decane, 2,4,6-trimethyl-	62105-27-4	5.00	NGS	12	JNT
S16T034230				Heptane, 5-ethyl-2,3-dimethyl-	62195-06-8	5.14	NGS	57	JNT
S16T034230				Undecane	1120-21-4	5.44	NGS	43	JNT
S16T034230				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	57	JNT
S16T034230				Dodecane, 2,6,11-trimethyl-	31295-55-4	6.89	NGS	15	JNT
S16T034230				Undecane, 2-methyl-	7045-71-8	7.26	NGS	12	JNT
S16T034230			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034230			BLNK	Perylene-D12	1520-98-3	15.80	NGS	3.9	

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 J = Estimated

N = Named TIC

U = Less Than Detection Limit

T = Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162992

SDG Number:

Customer Sample ID: 16-08635-1-IN-H  
 Customer Sample ID: 16-08635-1-IN-H

Sample#	R	AS	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034231				2-Butoxyethanol	111-76-2	3.71	NGS	26	JNT
S16T034231				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	47	JNT
S16T034231				Undecane	1120-21-4	5.45	NGS	21	JNT
S16T034231				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	42	JNT
S16T034231				1,2-Benzisothiazole	272-16-2	6.59	NGS	25	JNT
S16T034231				Decane, 2,4,6-trimethyl-	62108-27-4	6.89	NGS	11	JNT
S16T034231				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.18	NGS	31	JNT
S16T034231			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	17	
S16T034231			BLNK	Perylene-D12	1520-96-3	15.80	NGS	3.9	

T - Tentatively Identified Compound      U - Less Than Detection Limit      N - Named TIC      NA = Not Analyzed, ND = Not Detected  
 J - Estimated



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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993

SDG Number:

Customer Sample ID: 16-08635-1-BASE-EFF

Customer Sample ID: 16-08635-1-BASE-EFF

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cont Err %	Qual Flags
VAPOR-TDU SVQA #2															
S16T034232			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034232			86-48-7	2-Methylphenol	NGS	96	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	J
S16T034232			108-39-4M	Cresol (m & p)	NGS	90	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T034232			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	J
S16T034232			78-46-8	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	J
S16T034232			84-88-2	Dioctylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	J
S16T034232			112-40-3	Dodecane	NGS	96	<0.60	14	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034232			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T034232			829-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034232			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T034232			629-50-5	Tridecane	NGS	96	<1.6	8.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034232			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T034232			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SDG Number:  
 Customer Sample ID: 16-08635-1-BASE-IN  
 Customer Sample ID: 16-08635-1-BASE-IN

Sample#	R	MS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOUR-TDU SVOA #2															
S16T034233			3891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034233			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034233			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034233			92-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034233			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034233			84-88-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034233			112-40-3	Dodecane	NGS	100	<0.60	5.9	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034233			544-76-3	Heptadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034233			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034233			126-73-8	Tributyl phosphato	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034233			629-50-5	Tridecane	NGS	100	<1.6	4.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034233			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034233			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

MA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SOG Number:  
 Customer Sample ID: 16-08635-1-BLANK1  
 Customer Sample ID: 16-08635-1-BLANK1

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034234			3691-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034234			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034234			108-38-4M	Cresol (m & p)	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034234			82-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034234			76-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034234			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034234			112-40-3	Dodecane	NGS	100	<0.60	1.1	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034234			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034234			629-58-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034234			128-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034234			629-50-5	Tridecane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034234			629-76-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034234			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SDG Number:  
 Customer Sample ID: 16-08635-1-BLANK2  
 Customer Sample ID: 16-08635-1-BLANK2

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU SVQA #2															
S16T034235			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034235			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034235			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034235			80-52-4	Biphenyl	NGS	100	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034235			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034235			84-86-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034235			112-40-3	Dodecane	NGS	100	<0.60	0.60	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034235			544-76-3	Heaudecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034235			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034235			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034235			629-50-5	Tridecane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034235			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034235			629-82-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

MA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162593  
 SDG Number:  
 Customer Sample ID: 16-08635-1-IN-C  
 Customer Sample ID: 16-08635-1-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034237			3691-98-3	2,6,10-Trimethyldecane	NGS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034237			85-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034237			106-39-4M	Cresol (m & p)	NGS	110	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	U
S16T034237			82-52-4	Biphenyl	NGS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034237			78-45-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034237			84-86-2	Diethylphthalate	NGS	88	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034237			112-40-3	Dodecane	NGS	100	<0.80	20	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034237			544-76-3	Hexadecane	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034237			529-59-4	Tetradecane	NGS	94	<3.9	8.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034237			126-73-8	Tributyl phosphata	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034237			529-50-5	Trisecane	NGS	98	<1.5	10	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034237			529-78-7	Heptadecane	NGS	96	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034237			529-62-9	Pentadecane	NGS	95	<3.0	3.2	n/a	n/a	n/a	n/a	3.0	n/a	J

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SDG Number:  
 Customer Sample ID: 16-08635-1-IN-D  
 Customer Sample ID: 16-08635-1-IN-D

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crst Err %	Qual Flags
VAPOR-TDU SVOCs #2															
S16T034238			3891-98-3	2,6,10-Trimethyldecane	NGS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034238			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034238			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034238			82-62-4	Biphenyl	NGS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034238			78-46-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034238			84-66-2	Diethylphthalate	NGS	88	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034238			112-40-3	Dodecane	NGS	100	<0.60	30	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034238			544-78-3	Hexadecane	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034238			829-59-4	Tetradecane	NGS	94	<3.9	4.2	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034238			128-73-8	Tributyl phosphate	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034238			829-50-5	Tridecane	NGS	98	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034238			829-78-7	Heptadecane	NGS	96	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034238			829-62-9	Pentadecane	NGS	95	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162593  
 SDG Number:  
 Customer Sample ID: 16-08635-1-IN-E  
 Customer Sample ID: 16-08635-1-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034239			3891-98-3	2,6,10-Trimethyldecane	NGS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034239			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034239			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034239			82-52-4	Biphenyl	NGS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034239			78-45-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034239			84-86-2	Diethylphthalate	NGS	88	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034239			112-40-3	Dodecane	NGS	100	<0.60	9.7	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T034239			544-76-3	Hexadecane	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034239			829-59-4	Tetradecane	NGS	94	<3.9	6.2	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034239			126-73-8	Tributyl phosphate	NGS	76	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034239			829-50-5	Trisecane	NGS	96	<1.6	4.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034239			829-78-7	Heptadecane	NGS	96	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034239			829-62-9	Pentadecane	NGS	95	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SDG Number:  
 Customer Sample ID: 16-06635-1-IN-F  
 Customer Sample ID: 16-06635-1-IN-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RFD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVDA #2															
S16T034240			3891-98-3	2,6,10-Trimethylododecane	NGS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034240			85-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034240			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034240			82-52-4	Biphenyl	NGS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034240			78-46-6	Diethyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034240			84-66-2	Diethylphthalate	NGS	88	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034240			112-40-3	Dodecane	NGS	100	<0.60	29	n/a	n/a	n/a	n/a	0.65	n/a	
S16T034240			544-76-3	Heptadecane	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034240			829-59-4	Tetradecane	NGS	94	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034240			126-73-8	Tributyl phosphate	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034240			829-50-5	Tridecane	NGS	98	<1.6	6.5	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034240			829-78-7	Heptadecane	NGS	96	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034240			829-62-9	Pentadecane	NGS	95	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162993  
 SDG Number:  
 Customer Sample ID: 16-08635-1-IN-G  
 Customer Sample ID: 16-08635-1-IN-G

Sample#	R	AJ	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034241			3681-96-3	2,5,10-Trimethylododecane	NGS	92	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034241			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034241			106-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034241			92-52-4	Biphenyl	NGS	90	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034241			76-45-6	Diethyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034241			84-66-2	Diethylphthalate	NGS	88	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034241			112-40-3	Dodecane	NGS	100	<0.80	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034241			544-76-3	Hexadecane	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034241			829-59-4	Tetradecane	NGS	94	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034241			126-73-8	Tributyl phosphate	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034241			829-50-5	Tridecane	NGS	98	<1.6	5.3	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034241			829-76-7	Heptadecane	NGS	96	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034241			829-62-9	Pentadecane	NGS	95	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

*John M. Dwyer*  
 11/22/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-A

Customer Sample ID: 16-08636-1-EFF-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Colt Err %	Qual Flags
VAPOR-TDU SVOA R2															
S16T034242			8891-86-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034242			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034242			108-39-4W	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034242			80-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034242			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034242			84-98-2	Dioctylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034242			112-40-3	Dodecane	NGS	100	<0.60	12	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034242			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034242			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034242			126-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034242			829-50-5	Tridecane	NGS	97	<1.6	6.9	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034242			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034242			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected  
 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162394

SDG Number:

Customer Sample ID: 16-08636-1-EFF-B

Customer Sample ID: 16-08636-1-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVQA R2															
S16T034243			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034243			65-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034243			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034243			32-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034243			78-46-6	Diethyl se-rylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034243			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034243			112-40-3	Dodecane	NGS	100	<0.60	19	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034243			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034243			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034243			126-73-8	Tributyl phosphate	NGS	84	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034243			829-50-5	Tridecane	NGS	97	<1.6	9.2	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034243			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034243			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected  
 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-C

Customer Sample ID: 16-08636-1-EFF-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR:TDU SVGA #2															
S16T034244			3891-58-3	2,6,10-Trimethyldecane	NGS	110	<3.9	4.7	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034244			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034244			109-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034244			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034244			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034244			84-56-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034244			112-40-3	Dodecane	NGS	100	<0.60	19	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034244			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034244			829-69-4	Tetradecane	NGS	120	<3.9	8.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034244			126-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034244			629-50-5	Tridecane	NGS	97	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034244			629-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034244			629-62-9	Pentadecane	NGS	120	<3.0	3.0	n/a	n/a	n/a	n/a	3.0	n/a	J

NA = Not Analyzed, ND = Not Detected  
 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-D

Customer Sample ID: 16-08636-1-EFF-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU SVQA #2															
S16T034245			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034245			85-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034245			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034245			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034245			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034245			84-99-2	Dioethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034245			112-40-3	Dodecane	NGS	100	<0.60	1.1	n/a	n/a	n/a	n/a	0.55	n/a	U
S16T034245			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034245			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034245			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034245			629-50-5	Tridecane	NGS	97	<1.6	6.7	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034245			629-76-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034245			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162394

SDG Number:

Customer Sample ID: 16-08636-1-EFF-E

Customer Sample ID: 16-08636-1-EFF-E

Sample#	R	As	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RSD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOIR-TDU SVQA R2															
S16T034246			3881-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034246			55-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T034246			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034246			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T034246			78-46-6	Dibutyl se/yphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T034246			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T034246			112-40-3	Dodecane	NGS	100	<0.60	9.3	n/a	n/a	n/a	n/a	0.55		n/a J
S16T034246			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034246			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034246			128-73-8	Tributyl phosphato	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034246			829-50-5	Tridecane	NGS	97	<1.6	5.6	n/a	n/a	n/a	n/a	1.6		n/a J
S16T034246			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034246			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162394

SDG Number:

Customer Sample ID: 16-08636-1-EFF-F

Customer Sample ID: 16-08636-1-EFF-F

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU SVGA R2															
S16T034247			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034247			85-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034247			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034247			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034247			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034247			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034247			112-40-3	Dodecane	NGS	100	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034247			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034247			829-89-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034247			126-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034247			829-80-5	Tridecane	NGS	97	<1.6	8.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034247			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034247			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-G

Customer Sample ID: 16-08636-1-EFF-G

Sample#	R	IAJ	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Con Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034248			3581-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034248			95-49-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034248			106-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034248			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034248			78-46-8	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034248			94-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034248			112-40-3	Dodecane	NGS	100	<0.60	30	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034248			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034248			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034248			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034248			629-50-5	Trisecane	NGS	97	<1.6	4.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034248			629-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034248			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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J = Estimated

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162894

SDG Number:

Customer Sample ID: 16-08636-1-EFF-H

Customer Sample ID: 16-08636-1-EFF-H

Sample#	R	As	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034249			3881-66-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034249			55-49-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034249			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034249			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034249			78-45-6	Diethyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034249			54-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034249			112-40-3	Dodecane	NGS	100	<0.60	12	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034249			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034249			529-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034249			126-73-8	Triethyl phosphata	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034249			529-50-5	Tridecane	NGS	97	<1.6	5.5	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034249			529-76-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034249			529-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-IN-A

Customer Sample ID: 16-08636-1-IN-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034250			5891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034250			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T034250			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034250			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T034250			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T034250			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T034250			112-40-3	Dodecane	NGS	100	<0.60	13	n/a	n/a	n/a	n/a	0.56		n/a U
S16T034250			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034250			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034250			126-73-6	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034250			829-50-5	Tridecane	NGS	97	<1.6	8.0	n/a	n/a	n/a	n/a	1.6		n/a J
S16T034250			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034250			829-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-IN-H

Customer Sample ID: 16-08636-1-IN-H

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034251			8891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034251			95-48-7	2-Methylphorol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034251			109-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034251			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034251			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034251			94-88-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034251			112-40-3	Dodecane	NGS	100	<0.60	16	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034251			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034251			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034251			126-73-8	Triethyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034251			629-50-5	Tridecane	NGS	87	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034251			629-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034251			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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N - Named TIC

J - Estimated

U - Less Than Detection Limit

*John D. King*  
 11/22/16

**Cartridge Evaluation  
 Data Summary Report**

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-A

Customer Sample ID: 16-08636-1-EFF-A

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TOU SV0A #2									
S16T034242				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	29	JNT
S16T034242				Undecane	1120-21-4	5.44	NGS	18	JNT
S16T034242				Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	11	JNT
S16T034242				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	40	JNT
S16T034242				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	15	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-B

Customer Sample ID: 16-08636-1-EFF-B

Sample#	R	AS	QC Type	Analyte	CAS No.	Retention Time (Min-sec)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034243				Cyclotetrasiloxane, octamethyl	558-67-2	4.35	NGS	34	JNT
S16T034243				Decane, 2,4,6-trimethyl-	62105-27-4	5.04	NGS	16	JNT
S16T034243				Acetophenone	96-86-2	5.18	NGS	9.6	JNT
S16T034243				Undecane	1120-21-4	5.44	NGS	29	JNT
S16T044243				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	40	JNT
S16T034243				Benzothiazole	96-16-9	6.59	NGS	27	JNT
S16T034243				Undecane, 2-nonyl-	7045-71-8	7.25	NGS	19	JNT

U - Less Than Detection Limit  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-C

Customer Sample ID: 16-08636-1-EFF-C

Sample#	R	AS	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034244				1-Hexane, 4-ethyl-	16746-85-3	3.65	NGS	45	JNT
S16T034244				2-Butoxyethanol	111-76-2	3.71	NGS	87	JNT
S16T034244				Cyclohexane, octamethyl	558-67-2	4.35	NGS	57	JNT
S16T034244				Decane, 2,4,6-trimethyl-	62105-27-4	5.09	NGS	6.9	JNT
S16T034244				Acetophenone	98-96-2	5.18	NGS	19	JNT
S16T034244				Benzene, 1-ethyl-3-ethyl-	7525-62-4	5.34	NGS	34	JNT
S16T034244				Benzene, ethyl-, 7,7-dimethyl-	617-94-7	5.36	NGS	32	JNT
S16T034244				Undecane	1120-21-4	5.44	NGS	60	JNT
S16T034244				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	53	JNT
S16T034244				Benzothiazole	95-16-9	6.59	NGS	35	JNT
S16T034244				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.69	NGS	25	JNT

NA = Not Analyzed, ND = Not Detected  
 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-D

Customer Sample ID: 16-08636-1-EFF-D

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVCA #2									
S16T034245				Cyclohexane, hexamethyl-	541-05-9	2.84	NGS	28	JNT
S16T034245				Cyclohexane, octamethyl-	555-87-2	4.35	NGS	29	JNT
S16T034245				Acetophenone	98-46-2	5.18	NGS	6.4	JNT
S16T034245				Undecane	1120-21-4	5.44	NGS	17	JNT
S16T034245				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	44	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-E

Customer Sample ID: 16-08636-1-EFF-E

Sample#	R	As	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034246				Undecane	1120-21-4	5.44	NGS	14	JNT
S16T034246				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	32	JNT
S16T034246				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	13	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994  
 SDG Number:

Customer Sample ID: 16-08636-1-EFF-F  
 Customer Sample ID: 16-08636-1-EFF-F

Sample#	R	As	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034247				Cyclotrisiloxane, hexamethyl-	541-05-9	2.85	NGS	30	JNT
S16T034247				Cyclotetrasiloxane, octamethyl	555-67-2	4.35	NGS	33	JNT
S16T034247				Decane, 2,4,6-trimethyl-	82106-27-4	5.09	NGS	5.1	JNT
S16T034247				Undecane	1120-21-4	5.44	NGS	30	JNT
S16T034247				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	39	JNT
S16T034247				Benzothiazole	95-15-9	6.59	NGS	27	JNT

NA = Not Analyzed, ND = Not Detected  
 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162934

SDG Number:

Customer Sample ID: 16-08636-1-EFF-G  
 Customer Sample ID: 16-08636-1-EFF-G

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SYDA #2									
S16T034248				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	63	JNT
S16T034248				Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	92	JNT
S16T034248				Decane, 2,4,6-trimethyl-	82106-27-4	5.10	NGS	43	JNT
S16T034248				Undecane	1120-21-4	5.45	NGS	110	JNT
S16T034248				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	44	JNT
S16T034248				Undecane, 2,6-dimethyl-	17301-23-4	5.91	NGS	10	JNT
S16T034248				Dodecane, 2,6,11-trimethyl-	31285-56-4	6.89	NGS	20	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-EFF-H

Customer Sample ID: 16-08636-1-EFF-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA R2									
S16T034249				Cyclotetrasiloxane, octamethyl	559-67-2	4.35	NGS	26	JNT
S16T034249				Undecane	1120-21-4	5.44	NGS	20	JNT
S16T034249				Undecane, 2,6-dimethyl-	17301-23-4	5.49	NGS	11	JNT
S16T034249				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	27	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-IN-A

Customer Sample ID: 16-08636-1-IN-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVQA #2									
S16T034250				Cyclotrisiloxane, hexamethyl-	541-05-9	2.84	NGS	25	JNT
S16T034250				Unknown-1	-	3.27	NGS	40	JT
S16T034250				Heptanal	111-71-7	3.65	NGS	32	JNT
S16T034250				2-Butoxyethanol	111-76-2	3.71	NGS	34	JNT
S16T034250				Cyclotrisiloxane, octamethyl	556-67-2	4.35	NGS	57	JNT
S16T034250				Acetophenone	98-86-2	5.18	NGS	7.8	JNT
S16T034250				Undecane	1120-21-4	5.44	NGS	29	JNT
S16T034250				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	44	JNT
S16T034250				Dodecano, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	14	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162994

SDG Number:

Customer Sample ID: 16-08636-1-IN-H

Customer Sample ID: 16-08636-1-IN-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T034251				2-Butoxyethanol	111-76-2	3.71	NGS	26	JNT
S16T034251				Cyclohexasiloxane, octamethyl	555-67-2	4.35	NGS	35	JNT
S16T034251				Decane, 2,4,6-trimethyl-	62108-27-4	5.27	NGS	8.4	JNT
S16T034251				Undecane, 2,6-dimethyl-	17301-23-4	5.32	NGS	14	JNT
S16T034251				Undecane	1120-21-4	5.44	NGS	35	JNT
S16T034251				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	32	JNT

U - Less Than Detection Limit

J - Estimated

N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound

*Spencer*  
 11/22/14

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995

SDG Number:

Customer Sample ID: 16-08636-1-BASE-EFF

Customer Sample ID: 16-08636-1-BASE-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034252			3891-84-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034252			35-45-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T034252			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034252			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T034252			78-46-6	Diethyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T034252			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T034252			112-40-3	Dodecane	NGS	100	<0.60	13	n/a	n/a	n/a	n/a	0.55		n/a
S16T034252			844-76-3	Heptadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034252			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T034252			126-73-8	Tributyl phosphato	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T034252			629-50-5	Tridecane	NGS	97	<1.6	8.1	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034252			629-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034252			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U

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 T = Tentatively Identified Compound

N - Named TIC

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-BASE-IN  
 Customer Sample ID: 16-08636-1-BASE-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVDA #2															
S16T034253			3891-88-3	2,8,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034253			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034253			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034253			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034253			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034253			84-86-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034253			112-40-3	Dodecane	NGS	100	<0.60	5.2	n/a	n/a	n/a	n/a	0.60	n/a	J
S16T034253			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034253			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034253			126-73-6	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034253			828-50-5	Tridecane	NGS	97	<1.6	3.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034253			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034253			828-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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 T = Tentatively Identified Compound

N = Named TIC

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-BLANK-EFF  
 Customer Sample ID: 16-08636-1-BLANK-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034254			3891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034254			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034254			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034254			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034254			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034254			94-86-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034254			112-60-3	Dodecane	NGS	100	<0.80	0.60	n/a	n/a	n/a	n/a	0.85	n/a	J
S16T034254			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034254			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034254			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034254			629-50-5	Tridecane	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034254			629-76-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034254			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

U - Less Than Detection Limit  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 T - Tentatively Identified Compound



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-BLANK-IN  
 Customer Sample ID: 16-08636-1-BLANK-IN

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR: TDU SYDIA #2															
S161034255			3891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S161034255			85-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S161034255			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034255			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S161034255			78-48-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S161034255			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S161034255			112-40-3	Dodecane	NGS	100	<0.60	0.60	n/a	n/a	n/a	n/a	0.55	n/a	J
S161034255			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S161034255			829-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S161034255			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034255			829-90-5	Tridecane	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S161034255			829-76-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S161034255			829-62-8	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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 T = Tentatively Identified Compound

N = Named TIC

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-IN-B  
 Customer Sample ID: 16-08636-1-IN-B

Sample#	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034256			3891-66-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a/U
S16T034256			95-46-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a/U
S16T034256			108-39-6M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a/U
S16T034256			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a/U
S16T034256			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a/U
S16T034256			94-86-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a/U
S16T034256			112-40-3	Dodecane	NGS	100	<0.60	31	n/a	n/a	n/a	n/a	0.55		n/a
S16T034256			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
S16T034256			629-59-4	Tetradecane	NGS	120	<3.9	5.4	n/a	n/a	n/a	n/a	3.9		n/a/J
S16T034256			126-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a/U
S16T034256			629-50-5	Tridecane	NGS	97	<1.6	12	n/a	n/a	n/a	n/a	1.6		n/a
S16T034256			629-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S16T034256			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a/U

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 T = Tentatively Identified Compound

N = Named TIC

J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-IN-C  
 Customer Sample ID: 16-08636-1-IN-C

Sample#	IR #	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2														
S16T034257		3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034257		95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034257		108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034257		92-62-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034257		78-45-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034257		84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034257		112-40-3	Dodecane	NGS	100	<0.60	22	n/a	n/a	n/a	n/a	0.55	n/a	U
S16T034257		544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034257		829-39-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034257		126-73-8	Tributyl phosphite	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034257		829-50-5	Tridecane	NGS	97	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034257		829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034257		829-62-9	Pentadecane	NGS	120	<3.0	3.4	n/a	n/a	n/a	n/a	3.0	n/a	J

NA = Not Analyzed, ND = Not Detected  
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J = Estimated

U = Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-IN-D  
 Customer Sample ID: 16-08636-1-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVON #2															
S16T034258			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034258			95-46-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034258			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034258			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034258			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034258			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034258			112-40-3	Dodecane	NGS	100	<0.60	26	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034258			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034258			829-59-4	Tetradecane	NGS	120	<3.9	3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T034258			126-73-8	Tributyl phosphato	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034258			829-30-5	Tridecane	NGS	97	<1.6	9.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034258			829-78-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034258			829-62-6	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995  
 SDG Number:  
 Customer Sample ID: 16-08636-1-IN-E  
 Customer Sample ID: 16-08636-1-IN-E

Sample#	R	AF	CAS #	VOA #2	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Dat Limit	Cnt Err %	Qual Flag
S161034259			3891-68-3		2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S161034259			95-46-7		2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S161034259			108-39-4M		Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034259			92-62-4		Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S161034259			78-45-6		Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S161034259			84-66-2		Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S161034259			112-40-3		Dodecane	NGS	100	<0.60	10	n/a	n/a	n/a	n/a	0.55	n/a	U
S161034259			544-76-3		Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S161034259			629-39-4		Tetradecane	NGS	120	<3.9	6.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S161034259			126-73-8		Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S161034259			629-30-5		Tridecane	NGS	97	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S161034259			629-78-7		Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S161034259			629-62-9		Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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J = Estimated

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162995

SDG Number:

Customer Sample ID: 16-08636-1-IN-F

Customer Sample ID: 16-08636-1-IN-F

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T034260			3891-88-3	2,6,10-Trimethyldecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034260			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T034260			108-39-4M	Cresol (m & p)	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034260			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T034260			78-46-6	Diethyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T034260			84-86-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T034260			112-40-3	Dodecane	NGS	100	<0.80	31	n/a	n/a	n/a	n/a	0.55	n/a	
S16T034260			544-76-3	Hexadecane	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034260			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T034260			126-73-8	Tributyl phosphate	NGS	94	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T034260			629-50-5	Tridecane	NGS	97	<1.6	6.8	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034260			629-76-7	Heptadecane	NGS	97	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034260			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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U - Less Than Detection Limit

*John*  
 11/16/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-A  
 Customer Sample ID: 16-08635-2-EFF-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA 82															
S16T034182			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034182			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034182			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034182			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034182			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034182			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034182			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034182			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034182			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a L U
S16T034182			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a L U
S16T034182			71-23-8	1-Propanol	NGS	120	7.2	4.8	n/a	n/a	n/a	n/a	3.0		n/a B U
S16T034182			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034182			1706-29-3	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034182			28-93-3	2-Butanone	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9		n/a J
S16T034182			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034182			591-78-6	2-Hexanone	NGS	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034182			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034182			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034182			106-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034182			106-69-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034182			105-42-0	4-Methyl-2-heptanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034182			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034182			67-64-1	Acetone	NGS	97	<4.3	6.1	n/a	n/a	n/a	n/a	4.3		n/a J
S16T034182			75-05-6	Acetonitrile	NGS	91	<1.8	8.6	n/a	n/a	n/a	n/a	1.8		n/a J
S16T034182			98-89-2	Acetophenone	NGS	100	<2.8	3.4	n/a	n/a	n/a	n/a	2.6		n/a J
S16T034182			107-13-1	Acrylonitrile	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034182			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U

Y - Comment  
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 L - LLS Outside Range  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-A  
 Customer Sample ID: 16-08635-2-EFF-A

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034182			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034182			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034182			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034182			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034182			108-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034182			56-23-5	Carbon tetrachloride	NGS	130	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034182			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			110-62-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034182			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034182			64-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034182			141-79-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			110-00-9	Furan	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034182			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034182			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			128-66-7	Methacrylonitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034182			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034182			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034182			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034182			110-59-8	Pentanenitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034182			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034182			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034182			100-42-5	Styrene	NGS	110	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034182			127-18-4	Tetrachloroethene	NGS	120	<1.5	51	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034182			108-66-3	Toluene	NGS	110	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J

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 U - Less Than Detection Limit



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-A  
 Customer Sample ID: 16-08635-2-EFF-A

Sample#	R	MS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034182			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034182			75-69-4	Trichlorofluoroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034182			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034182			123-86-4	n-Butyl acetate	NGS	98	<1.4	1.4	n/a	n/a	n/a	n/a	1.4		n/a J
S16T034182			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034182			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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J - Estimated  
 N - Named TIC

B - Blank Contamination  
 E - Outside Calibration Range

Y - Comment  
 T - Tentatively Identified Compound  
 L - LLS Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-B  
 Customer Sample ID: 16-08635-2-EFF-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034183			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034183			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034183			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034183			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			542-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034183			105-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034183			123-81-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034183			71-38-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a LUJ
S16T034183			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a LU
S16T034183			71-23-8	1-Propanol	NGS	120	7.2	6.0	n/a	n/a	n/a	n/a	3.0		n/a BU
S16T034183			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034183			1706-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a Uc
S16T034183			78-53-3	2-Butanone	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9		n/a J
S16T034183			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034183			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034183			78-84-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034183			105-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			105-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034183			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034183			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034183			87-84-1	Acetone	NGS	97	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3		n/a U
S16T034183			75-05-8	Acetonitrile	NGS	91	<1.8	11	n/a	n/a	n/a	n/a	1.8		n/a J
S16T034183			86-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034183			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034183			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a Uc

Y - Comment  
 T - Tentatively Identified Compound  
 L - LLS Outside Range  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 MA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-B  
 Customer Sample ID: 16-08635-2-EFF-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034183			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034183			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034183			100-47-0	Benzotrifluoride	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034183			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034183			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034183			56-23-5	Carbon tetrachloride	NGS	130	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034183			108-90-7	Chlorobenzene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034183			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034183			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034183			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034183			64-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4		n/a U
S16T034183			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034183			628-73-9	Hexafluoride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			126-96-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			75-09-2	Methylene Chloride	NGS	100	<2.7	2.8	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034183			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034183			96-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034183			110-59-8	Pentaerythritol	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034183			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034183			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			127-18-4	Tetrachloroethene	NGS	120	<1.5	37	n/a	n/a	n/a	n/a	1.6		n/a
S16T034183			108-88-3	Toluene	NGS	110	<1.5	2.0	n/a	n/a	n/a	n/a	1.5		n/a U

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 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-EFF-B

Customer Sample ID: 16-08635-2-EFF-B

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034183			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034183			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034183			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034183			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034183			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034183			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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 U - Less Than Detection Limit

J - Estimated  
 N - Named TIC

B - Blank Contamination  
 E - Outside Calibration Range

Y - Comment  
 T - Tentatively Identified Compound  
 L - LLS Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-C  
 Customer Sample ID: 16-08635-2-EFF-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034184			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034184			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034184			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034184			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034184			107-06-2	1,2-Dichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034184			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034184			108-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034184			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034184			71-36-3	1-Ethanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a LUY
S16T034184			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a LU
S16T034184			71-23-8	1-Propanol	NGS	120	7.2	7.5	n/a	n/a	n/a	n/a	3.0		n/a BJ
S16T034184			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034184			1708-23-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a UC
S16T034184			78-53-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034184			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034184			591-78-5	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034184			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034184			78-94-4	3-Butan-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034184			106-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034184			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034184			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034184			108-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034184			57-64-1	Acetone	NGS	97	<4.3	11	n/a	n/a	n/a	n/a	4.3		n/a J
S16T034184			75-05-8	Acetonitrile	NGS	91	<1.8	20	n/a	n/a	n/a	n/a	1.8		n/a
S16T034184			88-86-2	Acetophenone	NGS	100	<2.6	2.7	n/a	n/a	n/a	n/a	2.6		n/a J
S16T034184			107-13-1	Arylfonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034184			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a UC

NA = Not Analyzed, ND = Not Detected

c - RPD Outside Range

U - Less Than Detection Limit

J - Estimated

N - Named TIC

B - Blank Certification

E - Outside Calibration Range

Y - Comment

T - Tentatively Identified Compound

L - LLS Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-C  
 Customer Sample ID: 16-08635-2-EFF-C

Sample#	R	AIJ	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034184			107-05-1	Methyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034184			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034184			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034184			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034184			166-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034184			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034184			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034184			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034184			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034184			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034184			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034184			54-17-5	Ethanol	NGS	100	<7.4	21	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T034184			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034184			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034184			110-60-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034184			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034184			528-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034184			126-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034184			75-08-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034184			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034184			58-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034184			110-59-8	Pentanenitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034184			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034184			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034184			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034184			127-18-4	Tetrachloroethene	NGS	120	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034184			108-88-3	Toluene	NGS	110	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162588  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-C  
 Customer Sample ID: 16-08635-2-EFF-C

Sample#	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rac %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034184			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034184			75-69-4	Trichlorofluoromethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034184			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034184			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034184			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034184			10051-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

Y - Comment  
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 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 MA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-D  
 Customer Sample ID: 16-08635-2-EFF-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TCU VOA #2															
S16T034185			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T034185			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034185			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034185			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T034185			107-05-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034185			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034185			106-66-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	J
S16T034185			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034185			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUF
S16T034185			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LUF
S16T034185			71-23-8	1-Propanol	NGS	120	7.2	6.6	n/a	n/a	n/a	n/a	3.0	n/a	BJ
S16T034185			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T034185			1708-28-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	UC
S16T034185			76-93-3	2-Butanone	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034185			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034185			591-76-6	2-Hexanone	NGS	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034185			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034185			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034185			108-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034185			108-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T034185			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T034185			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034185			67-64-1	Acetone	NGS	97	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T034185			75-05-8	Acetonitrile	NGS	91	<1.8	6.4	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034185			89-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034185			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034185			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	UC

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-D  
 Customer Sample ID: 16-08635-2-EFF-D

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cr1 Err %	Qual Flags
VAPOR-TDU VQA #2															
S16T034185			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034185			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034185			100-47-0	Benzonitrile	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034185			123-72-6	Benzal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034185			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034185			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034185			108-80-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			75-10-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034185			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034185			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034185			64-17-5	Ethanol	NGS	100	<7.4	38	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034185			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034185			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034185			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			126-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034185			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034185			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034185			96-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034185			110-59-8	Pentanenitrile	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034185			110-86-1	Pyridine	NGS	130	<3.6	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034185			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034185			127-18-4	Tetrachloroethane	NGS	120	<1.6	30	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034185			108-88-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162998  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-D  
 Customer Sample ID: 16-08635-2-EFF-D

Sample#	R	AS	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034185			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034185			75-69-4	Trichlorofluoromethane	NGS	110	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034185			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034185			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034185			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034185			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

NA = Not Analyzed, ND = Not Detected  
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 U - Less Than Detection Limit

J - Estimated  
 N - Named TIC

B - Blank Contamination  
 E - Outside Calibration Range

Y - Comment  
 T - Tentatively Identified Compound  
 L - LLS Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162588  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-E  
 Customer Sample ID: 16-08635-2-EFF-E

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034186			79-34-5	1,1,2,2-tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034186			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034186			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034186			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034186			167-46-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034186			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034186			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034186			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034186			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUY
S16T034186			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034186			71-23-8	1-Propanol	NGS	120	7.2	7.8	n/a	n/a	n/a	n/a	3.0	n/a	BU
S16T034186			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034186			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	UC
S16T034186			78-03-3	2-Butanone	NGS	110	<1.9	2.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034186			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034186			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034186			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034186			78-94-4	3-Buten-2-ene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034186			105-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034186			105-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034186			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034186			105-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034186			67-54-1	Acetone	NGS	97	<4.3	8.0	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034186			75-05-8	Acetonitrile	NGS	91	<1.8	7.4	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034186			96-95-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034186			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034186			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	UC

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 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-E  
 Customer Sample ID: 16-08635-2-EFF-E

Sample#	R	AF	CA#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034186			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034186			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034186			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034186			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034186			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034186			66-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034186			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034186			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034186			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034186			64-17-5	Ethanol	NGS	100	<7.4	56	n/a	n/a	n/a	n/a	7.4		n/a
S16T034186			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034186			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034186			628-73-9	Hexamethylenetetramine	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			128-08-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034186			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034186			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034186			99-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034186			110-59-8	Pentamethylenetetramine	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034186			107-12-0	Propenenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034186			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034186			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034186			127-18-4	Tetrachloroethene	NGS	120	<1.6	20	n/a	n/a	n/a	n/a	1.6		n/a
S16T034186			108-88-3	Toluene	NGS	110	<1.5	2.1	n/a	n/a	n/a	n/a	1.5		n/a U

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 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-E  
 Customer Sample ID: 16-08635-2-EFF-E

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU YGA #2															
S16T034186			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034186			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	3.4	n/a	n/a	n/a	n/a	1.6		n/a J
S16T034186			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034186			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034186			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034186			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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 MA - Not Analyzed, ND - Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-F  
 Customer Sample ID: 16-08635-2-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cst Err %	Deal Flags
VAPOR-TDU VOA #2															
S16T034187			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034187			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034187			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034187			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034187			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034187			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034187			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034187			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUY
S16T034187			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034187			71-23-8	1-Propanol	NGS	120	7.2	8.2	n/a	n/a	n/a	n/a	3.0	n/a	BU
S16T034187			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034187			1709-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	UC
S16T034187			78-83-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034187			110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034187			581-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034187			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034187			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034187			166-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			166-66-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034187			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034187			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034187			57-64-1	Acetone	NGS	97	<4.3	5.7	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T034187			75-05-8	Acetonitrile	NGS	91	<1.8	5.6	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034187			98-88-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034187			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034187			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	UC

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 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162588  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-F  
 Customer Sample ID: 16-08635-2-EFF-F

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034187			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034187			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034187			100-47-0	Benzonitrile	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034187			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034187			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034187			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034187			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			78-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034187			87-86-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034187			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034187			84-17-5	Ethanol	NGS	100	<7.4	80	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034187			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			110-00-9	Furan	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034187			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034187			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			128-88-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034187			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034187			81-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034187			89-85-3	Nitrobenzene	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034187			110-59-8	Pentanitrile	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034187			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034187			100-42-5	Styrene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034187			127-18-4	Tetrachloroethene	NGS	120	<1.8	18	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034187			108-89-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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 c - RPO Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-F  
 Customer Sample ID: 16-08635-2-EFF-F

Sample#	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VQA #2															
S16T034187			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/b U
S16T034187			75-69-4	Trichlorofluoromethane	NGS	110	<1.5	12	n/a	n/a	n/a	n/a	1.6		n/b J
S16T034187			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/b U
S16T034187			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/b U
S16T034187			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/b U
S16T034187			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/b U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-G  
 Customer Sample ID: 16-08635-2-EFF-G

Sample#	R	MF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Ctrl Err %	Qual Flags
VAPOR:TDU VQA #2															
S16T034188			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034188			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034188			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T034188			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034188			107-08-2	1,2-Dichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034188			542-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T034188			105-66-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T034188			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034188			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	n/a U
S16T034188			111-70-6	1-Hexanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T034188			71-23-8	1-Propanol	NGS	120	7.2	7.4	n/a	n/a	n/a	n/a	3.0	n/a	n/a BU
S16T034188			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T034188			1708-28-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034188			78-33-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034188			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034188			591-76-6	2-Hexanone	NGS	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T034188			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034188			78-94-4	3-Butan-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034188			105-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034188			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T034188			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034188			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034188			67-64-1	Acetone	NGS	97	<4.3	12	n/a	n/a	n/a	n/a	4.3	n/a	n/a J
S16T034188			75-05-8	Acetonitrile	NGS	91	<1.6	5.3	n/a	n/a	n/a	n/a	1.6	n/a	n/a J
S16T034188			98-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034188			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034188			107-18-6	Allyl Alcohol	NGS	120	<3.0	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-G  
 Customer Sample ID: 16-08635-2-EFF-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034188			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034188			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034188			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034188			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034188			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034188			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034188			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			110-52-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034188			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034188			64-17-5	Ethanol	NGS	100	<7.4	110	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034188			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034188			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			128-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034188			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034188			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034188			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			107-12-0	Propenenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034188			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034188			103-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			127-18-4	Tetrachloroethene	NGS	120	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034188			108-88-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-G  
 Customer Sample ID: 16-08635-2-EFF-G

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU YQA #2															
S16T034188			79-01-6	Trichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034188			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	28	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034188			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034188			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034188			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034188			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162588  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-H  
 Customer Sample ID: 16-08635-2-EFF-H

Sample#	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034189			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034189			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034189			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034189			167-06-2	1,2-Dichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034189			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034189			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034189			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUY
S16T034189			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034189			71-23-8	1-Propanol	NGS	120	7.2	8.7	n/a	n/a	n/a	n/a	3.0	n/a	BJ
S16T034189			105-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034189			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034189			78-93-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034189			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034189			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034189			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034189			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034189			105-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			106-88-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034189			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034189			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034189			87-84-1	Acetone	NGS	97	<4.3	18	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034189			75-05-8	Acetonitrile	NGS	91	<1.8	5.7	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034189			96-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034189			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034189			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-H  
 Customer Sample ID: 16-08635-2-EFF-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU VOR #2															
S16T034189			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034189			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034189			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034189			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034189			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034189			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034189			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034189			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034189			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034189			54-17-5	Ethanol	NGS	100	<7.4	110	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034189			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034189			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034189			528-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			126-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034189			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034189			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034189			58-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034189			110-59-8	Pentanitrile	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034189			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034189			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034189			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034189			127-18-4	Tetrachloroethene	NGS	120	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034189			108-88-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-H  
 Customer Sample ID: 16-08635-2-EFF-H

Sample#	R	Alt	CAJ #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034189			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034189			75-89-4	Trichlorofluoromethane	NGS	110	<1.5	17	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034189			10081-61-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T034189			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T034189			142-62-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T034189			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-A  
 Customer Sample ID: 16-08635-2-IN-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Corr %	Qual Flags
VAPOR-TDU VOA #2															
S16T004190			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T004190			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T004190			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T004190			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T004190			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T004190			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T004190			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T004190			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T004190			71-36-3	1-Boranol	NGS	120	<8.9	2.6E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELY
S16T004190			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T004190			71-23-8	1-Propanol	NGS	120	7.2	93	n/a	n/a	n/a	n/a	3.0	n/a	B
S16T004190			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T004190			1706-28-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T004190			78-93-3	2-Butanone	NGS	110	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T004190			110-43-0	2-Heptanone	NGS	99	<1.6	4.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T004190			591-78-6	2-Hexanone	NGS	98	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T004190			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T004190			78-94-4	3-Buten-2-one	NGS	100	<1.7	6.8	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T004190			106-35-4	3-Heptanone	NGS	100	<1.5	7.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T004190			106-88-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T004190			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T004190			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	7.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T004190			87-64-1	Acetone	NGS	97	<4.3	470	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T004190			75-05-8	Acetonitrile	NGS	91	<1.8	44	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T004190			98-86-2	Acetophenone	NGS	100	<2.6	2.9	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T004190			1007-13-1	Acrylonitrile	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T004190			1007-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-A  
 Customer Sample ID: 16-08635-2-IN-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034190			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034190			71-43-2	Benzene	NGS	110	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034190			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034190			123-72-8	Butanal	NGS	110	<2.1	1.5	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T034190			109-74-0	Butanenitrile	NGS	100	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034190			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034190			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034190			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034190			87-86-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034190			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034190			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034190			84-17-5	Ethanol	NGS	100	<7.4	200	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T034190			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034190			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034190			110-00-9	Furan	NGS	100	<1.6	20	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034190			110-54-3	Hexane	NGS	100	<1.7	13	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034190			628-73-9	Hexanenitrile	NGS	100	<1.5	1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034190			126-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034190			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034190			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034190			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034190			110-59-8	Pentanenitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034190			107-12-0	Propanenitrile	NGS	100	<1.4	3.0	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T034190			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034190			103-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034190			127-18-4	Tetrachloroethene	NGS	120	<1.6	81	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034190			108-88-3	Toluene	NGS	110	<1.5	10	n/a	n/a	n/a	n/a	1.5	n/a	J

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 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-A  
 Customer Sample ID: 16-08635-2-IN-A

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034190			79-01-8	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034190			78-69-4	Trichlorofluoromethane	NGS	110	<1.5	23	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034190			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034190			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034190			142-82-5	n-Heptane	NGS	100	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	
S16T034190			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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 L - LLS Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-H  
 Customer Sample ID: 16-08635-2-IN-H

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR:TDU VQA #2															
S16T034191			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034191			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034191			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034191			107-08-2	1,2-Dichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			542-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034191			105-49-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034191			123-81-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034191			71-36-3	1-Butanol	NGS	120	<8.9	2.4E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELY
S16T034191			111-70-6	1-Heptanol	NGS	83	<5.5	<5.5	n/a	n/a	n/a	n/a	5.5	n/a	LU
S16T034191			71-23-8	1-Propanol	NGS	120	7.2	6.6	n/a	n/a	n/a	n/a	3.0	n/a	B
S16T034191			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034191			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034191			76-93-3	2-Butanone	NGS	110	<1.9	6.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034191			110-43-0	2-Heptanone	NGS	99	<1.5	5.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034191			591-76-5	2-Hexanone	NGS	96	<1.2	3.1	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034191			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034191			78-94-4	3-Buten-2-one	NGS	100	<1.7	4.8	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034191			108-35-4	3-Heptanone	NGS	100	<1.5	4.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034191			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034191			105-42-0	4-Methyl-2-Pentanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034191			108-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034191			67-64-1	Acetone	NGS	97	4.3	31.0	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034191			74-05-8	Acetonitrile	NGS	91	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034191			89-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034191			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034191			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-H  
 Customer Sample ID: 16-08635-2-IN-H

Sample#	R	MF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limb	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034191			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034191			71-43-2	Benzene	NGS	110	<1.2	1.6	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034191			109-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034191			123-72-8	Butanal	NGS	110	<2.1	1.2	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T034191			109-74-0	Butanenitrile	NGS	100	<1.2	1.7	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034191			58-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034191			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034191			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			110-82-7	Cyclohexane	NGS	110	<1.5	<1.8	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034191			64-17-5	Ethanol	NGS	100	<7.4	170	n/a	n/a	n/a	n/a	7.4	n/a	
S16T034191			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			110-00-9	Furan	NGS	100	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034191			110-54-3	Hexane	NGS	100	<1.7	9.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034191			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034191			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034191			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034191			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034191			110-69-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034191			107-12-0	Propanenitrile	NGS	100	<1.4	2.7	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T034191			110-66-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034191			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034191			127-18-4	Tetrachloroethane	NGS	120	<1.6	90	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034191			108-88-3	Toluene	NGS	110	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-H  
 Customer Sample ID: 16-08635-2-IN-H

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPCAR-TCU VOA #2															
S16T034191			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034191			75-69-4	Trichlorofluoromethane	NGS	110	<1.5	18	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034191			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034191			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034191			142-82-5	n-Heptane	NGS	100	<1.4	12	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034191			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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 U - Less Than Detection Limit

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**Cartridge Evaluation  
 Data Summary Report**

Sample Group: 20162968  
 SDG Number:

Customer Sample ID: 16-08635-2-EFF-A  
 Customer Sample ID: 16-08635-2-EFF-A

Sample#	R	AS	OC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034182				Methyl formate	107-31-3	4.73	NGS	26 JNT	
S16T034182				Unknown-1	-	8.30	NGS	140 BJT	
S16T034182				Cyclotetrasiloxane, octamethyl	556-87-2	20.44	NGS	37 JNT	
S16T034182				Decane, 2,4,6-trimethyl-	82109-27-4	22.98	NGS	7.5 JNT	
S16T034182				Undecane	1120214	23.71	NGS	7.2 JNT	
S16T034182				Nonanal	124-19-6	23.95	NGS	26 JNT	
S16T034182				Unknown-3	-	24.22	NGS	140 JT	
S16T034182				Dodecane	112-40-3	25.26	NGS	14 JNT	
S16T034182				Methenamine	100-97-0	26.22	NGS	9.9 JNT	
S16T034182				Benzothiazole	86-16-9	26.34	NGS	62 JNT	
S16T034182				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	16 JNT	
S16T034182				Tetradecane	628-594	27.01	NGS	11 JNT	
S16T034182			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034182			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	39146-99-5	25.26	NGS	41	
S16T034182			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034182			BLNK	Unknown-3	-	27.51	NGS	860	

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-B  
 Customer Sample ID: 16-08635-2-EFF-B

Sample#	R	Alt	GC Type	Analyte	CAS No.	Reaction Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034183				Methyl formate	107-31-3	4.72	NGS	36	JNT
S16T034183				Unknown-1	-	8.32	NGS	200	BJT
S16T034183				Cyclotriasiloxane, octamethyl	556-67-2	20.44	NGS	25	JNT
S16T034183				Decane, 2,4,6-trimethyl-	82108-27-4	22.98	NGS	6.0	JNT
S16T034183				Undecane	1120214	23.71	NGS	5.7	JNT
S16T034183				Unknown-3	-	24.23	NGS	100	JT
S16T034183				Dodecane	112-40-3	25.26	NGS	14	JNT
S16T034183				Unknown-4	-	26.01	NGS	35	JT
S16T034183				Methanamine	100-97-0	26.23	NGS	34	JNT
S16T034183				Benzothiazole	55-16-9	26.35	NGS	49	JNT
S16T034183				Dodecane, 4,6-dimethyl-	81141728	26.43	NGS	16	JNT
S16T034183				Unknown-5	-	26.57	NGS	51	JT
S16T034183				Tetradecane	629594	27.01	NGS	9.0	JNT
S16T034183			BLNK	Unknown-1	-	6.25	NGS	39	
S16T034183			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	41	
S16T034183			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034183			BLNK	Unknown-3	-	27.51	NGS	860	

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-C  
 Customer Sample ID: 16-08635-2-EFF-C

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDUVOA R2									
S16T034184				Methyl formate	107-31-3	4.73	NGS	64	JNT
S16T034184				Methyl Acetate	79-20-9	7.46	NGS	30	JNT
S16T034184				Unknown-1	-	8.32	NGS	240	BJT
S16T034184				Decane, 2,4,6-trimethyl-	82109-27-4	22.98	NGS	7.6	JNT
S16T034184				Undecane	1120214	23.72	NGS	10	JNT
S16T034184				Undecane, 2,6-dimethyl-	17301-23-4	23.83	NGS	11	JNT
S16T034184				Unknown-3	-	24.23	NGS	130	JT
S16T034184				Dodecane	112-40-3	25.26	NGS	21	JNT
S16T034184				Methanamine	100-97-0	26.22	NGS	28	JNT
S16T034184				Benzothiazole	86-16-9	26.34	NGS	63	JNT
S16T034184				Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	19	JNT
S16T034184				Tridecane	328-505	26.57	NGS	24	JNT
S16T034184				Tetradecane	328594	27.01	NGS	12	JNT
S16T034184			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034184			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.28	NGS	41	
S16T034184			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034184			BLNK	Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-D  
 Customer Sample ID: 16-08635-2-EFF-D

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR:TDU.VOA.FZ									
S16T034185				Methyl formate	107-31-3	4.73	NGS	52	JNT
S16T034185				Unknown-1	-	8.32	NGS	240	BJT
S16T034185				Unknown-2	-	24.22	NGS	77	JT
S16T034185				Dodecane	112-40-3	25.26	NGS	5.6	JNT
S16T034185				Unknown-3	-	25.89	NGS	39	JT
S16T034185				Methanamine	100-97-0	26.24	NGS	22	JNT
S16T034185				Benzothiazole	55-16-9	26.35	NGS	29	JNT
S16T034185				Dodecane, 4,8-dimethyl-	61141728	26.45	NGS	11	JNT
S16T034185				Propanoic acid, 2-methyl-, 1-	74381-40-1	26.58	NGS	32	JNT
S16T034185				Tetradecane	629694	27.03	NGS	7.0	JNT
S16T034185			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034185			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.26	NGS	41	
S16T034185			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034185			BLNK	Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988  
 SDG Number:  
 Customer Sample ID: 16-08635-2-EFF-E  
 Customer Sample ID: 16-08635-2-EFF-E

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034186				Methyl formate	107-31-3	4.73	NGS	65	JNT
S16T034186				Unknown-1	-	8.32	NGS	280	BJT
S16T034186				2,2,7,7-Tetrahydrooctane	1071-31-4	21.50	NGS	62	JNT
S16T034186				Octane, 2,3,6,7-tetramethyl-	52870-34-5	22.70	NGS	35	JNT
S16T034186				Decane, 2,4,6-trimethyl-	62106-27-4	22.99	NGS	7.2	JNT
S16T034186				Undecane, 3-methyl-	1002-43-3	23.53	NGS	14	JNT
S16T034186				Undecane	1120214	23.71	NGS	5.0	JNT
S16T034186				Unknown-2	-	24.22	NGS	61	JT
S16T034186				Dodecane	112-49-3	25.26	NGS	8.3	JNT
S16T034186				Methanamine	100-67-0	25.23	NGS	39	JNT
S16T034186				Benzothiazole	95-16-9	26.34	NGS	41	JNT
S16T034186				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	12	JNT
S16T034186				Unknown-3	-	26.58	NGS	120	JT
S16T034186				Tetradecane	629694	27.01	NGS	5.7	JNT
S16T034186			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034186			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.26	NGS	41	
S16T034186			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034186			BLNK	Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Narrowed TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-EFF-F

Customer Sample ID: 16-08635-2-EFF-F

Sample#	R	AS	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034187				Methyl formate	107-31-3	4.73	NGS	69	JNT
S16T034187				Unknown-1	-	8.33	NGS	290	BJT
S16T034187				Decane, 2,4,6-trimethyl-	62-108-27-4	22.98	NGS	7.0	JNT
S16T034187				Undecane	1120214	23.72	NGS	7.8	JNT
S16T034187				Undecane, 2,6-dimethyl-	17301-23-4	23.83	NGS	11	JNT
S16T034187				Unknown-2	-	24.23	NGS	90	JT
S16T034187				Dodecane	112-40-3	26.26	NGS	15	JNT
S16T034187				Methanamine	100-87-0	26.22	NGS	39	JNT
S16T034187				Benzothiazole	95-16-9	26.34	NGS	51	JNT
S16T034187				Dodecane, 4,8-dimethyl-	6114728	26.42	NGS	14	JNT
S16T034187				Tetradecane	629594	27.00	NGS	6.2	JNT
S16T034187			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034187			BLNK	1,1,3,5,5,7,7-Heptamethyl-3	39146-99-5	26.26	NGS	41	
S16T034187			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034187			BLNK	Unknown-3	-	27.51	NGS	660	

Y - Comment  
 T - Tentatively Identified Compound

B - Blank Contamination  
 E - Outside Calibration Range

J - Estimated  
 N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-EFF-G  
 Customer Sample ID: 16-08635-2-EFF-G

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR:TDU VOA #2									
S16T034188				Methyl formate	107-31-3	4.73	NGS	67	JNT
S16T034188				Unknown-1	-	8.33	NGS	250	BJT
S16T034188				Cyclotrisiloxane, octamethyl	556-67-2	20.44	NGS	91	JNT
S16T034188				3-Ethyl-3-ethylheptane	17302-01-1	22.99	NGS	100	JNT
S16T034188				Decane, 2,4,6-trimethyl-	62105-27-4	23.12	NGS	38	JNT
S16T034188				Undecane	1120-21-4	23.72	NGS	27	JNT
S16T034188				Undecane, 4,7-dimethyl-	17301-32-5	23.83	NGS	77	JNT
S16T034188				Undecane, 4,8-dimethyl-	17312-82-2	23.93	NGS	50	JNT
S16T034188				Unknown-2	-	24.23	NGS	110	JT
S16T034188				Undecane, 3-methyl-	1002-43-3	24.89	NGS	6.2	JNT
S16T034188				Dodecane	112-40-3	25.26	NGS	21	JNT
S16T034188				Methanamine	100-97-0	26.24	NGS	68	JNT
S16T034188				Dodecane, 4,6-dimethyl-	51141728	26.44	NGS	17	JNT
S16T034188				Tetradecane	829594	27.02	NGS	6.1	JNT
S16T034188			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034188			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	38148-98-5	25.26	NGS	41	
S16T034188			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034188			BLNK	Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 G - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-EFF-H

Customer Sample ID: 16-08635-2-EFF-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034189				Methyl formate	107-31-3	4.72	NGS	53	JNT
S16T034189				Unknown-1	-	8.32	NGS	280	BJT
S16T034189				Unknown-2	-	24.22	NGS	48	JT
S16T034189				Dodecane	1124-03	25.26	NGS	6.5	JNT
S16T034189				Methanamine	100-97-0	26.22	NGS	58	JNT
S16T034189				Benzothiazole	85-16-9	26.35	NGS	26	JNT
S16T034189				Dodecane, 4,6-dimethyl-	811-1728	26.43	NGS	6.7	JNT
S16T034189			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034189			BLNK	1,1,3,5,5,7,7-Heptafluoro-3	38145-99-5	26.26	NGS	41	
S16T034189			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034189			BLNK	Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound  
 B - Blank Contamination  
 E - Outside Calibration Range  
 J - Estimated  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-IN-A

Customer Sample ID: 16-08635-2-IN-A

Sample#	R	AF	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034190				Methyl trifluoroacetate	431-47-0	4.72	NGS	130	JNT
S16T034190				Unknown-1	-	8.30	NGS	150	BJT
S16T034190				Methoxytrimethylsilane	1825-51-2	8.70	NGS	83	JNT
S16T034190				Tetrahydrofuran	109-89-9	11.97	NGS	82	JNT
S16T034190				N-Nitrosodimethylamine	82-75-9	15.69	NGS	8.2	JNT
S16T034190				Hexanal	56-25-1	16.82	NGS	29	JNT
S16T034190				Cyclotriazoxane, octamethyl	556-67-2	20.44	NGS	59	JNT
S16T034190				Decane, 2,4,6-trimethyl-	82108-27-4	22.96	NGS	11	JNT
S16T034190				Undecane, 2,6-dimethyl-	17301-23-4	23.83	NGS	13	JNT
S16T034190				Unknown-2	-	24.23	NGS	120	JT
S16T034190				Dodecane	112403	25.26	NGS	10	JNT
S16T034190				Methanamine	100-97-0	26.21	NGS	350	JNT
S16T034190				Dodecane, 4,6-dimethyl-	81141728	26.42	NGS	14	JNT
S16T034190				Tetradecane	628494	27.00	NGS	10	JNT
S16T034190				Unknown-1	-	8.25	NGS	39	
S16T034190				1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.26	NGS	41	
S16T034190				Unknown-2	-	27.44	NGS	350	
S16T034190				Unknown-3	-	27.51	NGS	860	

Y - Comment  
 T - Tentatively Identified Compound

B - Blank Contamination  
 E - Outside Calibration Range

J - Estimated  
 N - Named TIC

NA = Not Analyzed, ND = Not Detected  
 e - RPO Outside Range  
 U - Less Than Detection Limit

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162988

SDG Number:

Customer Sample ID: 16-08635-2-IN-H

Customer Sample ID: 16-08635-2-IN-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034191				Methyl formate	107-31-3	4.73	NGS	76	JNT
S16T034191				Unknown-1	-	8.30	NGS	140	BJT
S16T034191				Methoxydimethylsilane	1825-61-2	8.70	NGS	47	JNT
S16T034191				Tetrahydrofuran	108-98-9	11.98	NGS	76	JNT
S16T034191				Undecane	1120214	23.71	NGS	6.1	JNT
S16T034191				Unknown-2	-	24.23	NGS	53	JT
S16T034191				Dodecane	112-46-3	25.26	NGS	9.8	JNT
S16T034191				Methanamine	100-87-0	26.22	NGS	270	JNT
S16T034191				Benzothiazole	95-16-9	26.35	NGS	25	JNT
S16T034191				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	6.2	JNT
S16T034191				Propanoic acid, 2-methyl-, 1-(	74381-40-1	26.57	NGS	130	JNT
S16T034191				Tetradecane	629594	27.01	NGS	5.0	JNT
S16T034191			BLNK	Unknown-1	-	8.25	NGS	39	
S16T034191			BLNK	1,1,3,5,5,7,7-Nonamethyl-3	88146-99-3	25.26	NGS	41	
S16T034191			BLNK	Unknown-2	-	27.44	NGS	350	
S16T034191			BLNK	Unknown-3	-	27.51	NGS	860	

MA = Not Analyzed, ND = Not Detected  
 c - RPC Outside Range  
 U - Less Than Detection Limit

J - Estimated  
 N - Named TIC

B - Blank Contamination  
 E - Outside Calibration Range

Y - Comment  
 T - Tentatively Identified Compound

*Janet Dwyer*  
 11/16/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BASE-EFF  
 Customer Sample ID: 16-08635-2-BASE-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR:TDU VOA.#2															
S16T034192			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034192			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034192			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034192			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034192			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034192			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034192			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034192			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034192			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUY
S16T034192			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LUY
S16T034192			71-23-8	1-Propanol	NGS	120	7.2	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	BU
S16T034192			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034192			1705-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034192			78-83-3	2-Butanone	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034192			110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034192			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034192			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034192			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034192			105-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034192			106-88-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034192			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034192			106-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034192			57-64-1	Acetone	NGS	97	<4.3	9.0	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T034192			75-05-8	Acetonitrile	NGS	91	<1.8	14	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034192			98-88-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034192			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034192			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

Y - Comment  
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 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BASE-EFF  
 Customer Sample ID: 16-08635-2-BASE-EFF

Sampled	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat	Err %	Qual Flags
VAPOR-TDU VOA 12																
S16T034192			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a		n/a
S16T034192			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a		n/a
S16T034192			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a		n/a
S16T034192			123-72-8	Bucanall	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a		n/a
S16T034192			109-74-0	Bucanenthrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a		n/a
S16T034192			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			106-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a		n/a
S16T034192			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a		n/a
S16T034192			57-86-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a		n/a
S16T034192			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a		n/a
S16T034192			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a		n/a
S16T034192			54-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a		n/a
S16T034192			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a		n/a
S16T034192			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a		n/a
S16T034192			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a		n/a
S16T034192			528-73-9	Hexamethyl	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a		n/a
S16T034192			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a		n/a
S16T034192			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a		n/a
S16T034192			98-96-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a		n/a
S16T034192			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			107-12-0	Propionitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a		n/a
S16T034192			110-96-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a		n/a
S16T034192			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			127-18-4	Tetrachloroethene	NGS	120	<1.6	43	n/a	n/a	n/a	n/a	1.6	n/a		n/a
S16T034192			108-98-3	Toluene	NGS	110	<1.5	3.2	n/a	n/a	n/a	n/a	1.5	n/a		n/a

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - ILS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-06635-2-BASE-EFF  
 Customer Sample ID: 16-08635-2-BASE-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034192			79-01-6	Trichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034192			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034192			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034192			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034192			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034192			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 e - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BASE-IN  
 Customer Sample ID: 16-08635-2-BASE-IN

Sample#	R	A#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA 12															
S16T034193			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034193			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034193			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034193			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034193			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034193			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034193			108-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034193			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034193			71-36-3	1-Butanol	NGS	120	<8.9	36	n/a	n/a	n/a	n/a	8.9	n/a	LY
S16T034193			111-70-6	1-Heptanol	NGS	85	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034193			71-23-6	1-Propanol	NGS	120	7.2	8.0	n/a	n/a	n/a	n/a	3.0	n/a	BU
S16T034193			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034193			1706-20-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034193			78-93-3	2-Butanone	NGS	110	<1.9	4.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034193			110-43-0	2-Heptanone	NGS	99	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034193			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034193			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034193			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034193			106-35-4	3-Heptanone	NGS	100	<1.5	4.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034193			106-89-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034193			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034193			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	12	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034193			87-64-1	Acetone	NGS	97	<4.3	49	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034193			75-65-8	Acetonitrile	NGS	91	<1.8	26	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034193			88-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034193			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034193			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

NA = Not Analyzed, ND = Not Detected

c - RPD Outside Range

J - Estimated  
 L - LLS Outside Range

B - Blank Contamination  
 U - Less Than Detection Limit

Y - Comment  
 E - Outside Calibration Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BASE-IN  
 Customer Sample ID: 16-08635-2-BASE-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPQR-TDU VQA #2															
S16T034193			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034193			71-43-2	Benzene	NGS	110	<1.2	2.5	n/a	n/a	n/a	n/a	1.2		n/a J
S16T034193			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034193			123-72-8	Butanal	NGS	110	<2.1	3.1	n/a	n/a	n/a	n/a	2.1		n/a J
S16T034193			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034193			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034193			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034193			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034193			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034193			110-62-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034193			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034193			64-17-5	Ethanol	NGS	100	<7.4	24	n/a	n/a	n/a	n/a	7.4		n/a J
S16T034193			141-76-6	Ethyl acetate	NGS	100	<1.5	1.9	n/a	n/a	n/a	n/a	1.5		n/a J
S16T034193			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034193			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034193			110-54-3	Hexane	NGS	100	<1.7	1.7	n/a	n/a	n/a	n/a	1.7		n/a J
S16T034193			528-73-9	Hexamethylo	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034193			128-68-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034193			75-09-2	Methylens Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034193			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034193			86-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034193			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034193			107-12-0	Propanonitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034193			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034193			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034193			127-18-4	Tetrachloroethene	NGS	120	<1.6	78	n/a	n/a	n/a	n/a	1.6		n/a
S16T034193			108-88-3	Toluene	NGS	110	<1.5	13	n/a	n/a	n/a	n/a	1.5		n/a

Y - Comment  
 E - Outside Calibration Range  
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 J - Estimated  
 L - LLS Outside Range  
 c - RPD Outside Range  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BASE-IN  
 Customer Sample ID: 16-08635-2-BASE-IN

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA B2															
S16T034193			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034193			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	5.0	n/a	n/a	n/a	n/a	1.6		n/a J
S16T034193			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034193			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034193			142-82-5	n-Heptane	NGS	100	<1.4	3.8	n/a	n/a	n/a	n/a	1.4		n/a J
S16T034193			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPO Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SOG Number:  
 Customer Sample ID: 16-06635-2-BLANK1  
 Customer Sample ID: 16-06635-2-BLANK1

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	\$pk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034194			75-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034194			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034194			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034194			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034194			107-46-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034194			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034194			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034194			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034194			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	LUY
S16T034194			111-70-6	1-Heptanol	NGS	53	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034194			71-23-8	1-Propanol	NGS	120	7.2	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	BU
S16T034194			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034194			1708-29-6	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034194			78-60-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034194			110-43-0	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034194			591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034194			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034194			75-84-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034194			106-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034194			106-89-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034194			105-42-0	4-Methyl-2-heptanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034194			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034194			37-64-1	Acetone	NGS	97	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034194			75-05-6	Acetonitrile	NGS	91	<1.8	2.3	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034194			98-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034194			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034194			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - ULS Outside Range  
 c - RPD Outside Range  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BLANK1  
 Customer Sample ID: 16-08635-2-BLANK1

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T034194			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034194			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034194			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034194			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034194			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034194			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034194			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034194			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034194			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034194			124-18-5	Decane	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034194			54-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4		n/a U
S16T034194			141-78-0	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034194			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034194			110-00-9	Furan	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034194			328-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034194			126-88-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034194			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034194			98-85-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034194			110-59-8	Pentanenitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034194			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034194			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			127-18-4	Tetrachloroethene	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034194			108-88-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U

Y - Comment  
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 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SOG Number:  
 Customer Sample ID: 16-08635-2-BLANK1  
 Customer Sample ID: 16-08635-2-BLANK1

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cet Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034194			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T034194			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034194			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S16T034194			123-85-4	n-Butyl acetate	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S16T034194			142-82-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S16T034194			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a

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 J - Estimated  
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 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BLANK2  
 Customer Sample ID: 16-08635-2-BLANK2

Sample#	R	AJ	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T034195			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
S16T034195			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
S16T034195			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
S16T034195			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
S16T034195			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
S16T034195			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
S16T034195			165-45-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a,U
S16T034195			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
S16T034195			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a,LUY
S16T034195			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a,LU
S16T034195			71-23-8	1-Propanol	NGS	120	7.2	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U
S16T034195			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
S16T034195			1708-29-6	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,Uc
S16T034195			78-83-3	2-Butanone	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
S16T034195			110-43-6	2-Heptanone	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
S16T034195			591-78-6	2-Hexanone	NGS	58	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a,U
S16T034195			334-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
S16T034195			78-84-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
S16T034195			106-35-4	3-Heptanone	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
S16T034195			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
S16T034195			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
S16T034195			108-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U
S16T034195			37-64-1	Acetone	NGS	97	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3		n/a,U
S16T034195			75-05-8	Acetonitrile	NGS	91	<1.8	6.0	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034195			98-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
S16T034195			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a,U
S16T034195			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a,Uc

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BLANK2  
 Customer Sample ID: 16-08635-2-BLANK2

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034195			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034195			71-43-2	Benzene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034195			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034195			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034195			109-74-0	Butanenitrile	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T034195			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034195			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034195			124-18-5	Decane	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034195			94-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4		n/a U
S16T034195			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			110-00-9	Furan	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034195			110-54-3	Hexane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034195			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034195			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034195			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034195			110-59-8	Pentanenitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			107-12-0	Propanenitrile	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034195			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034195			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			127-18-4	Tetra-chloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			109-88-3	Toluene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U

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 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-BLANK2  
 Customer Sample ID: 16-08635-2-BLANK2

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034195			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034195			75-69-4	Trichlorofluoroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034195			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034195			123-66-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034195			142-62-5	n-Heptane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034195			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 e - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-B  
 Customer Sample ID: 16-08635-2-IN-B

Sample#	R #	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Em %	Qual Flags
VAPOR-TDU VOA #2															
S16T034196			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034196			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034196			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034196			75-35-4	1,1-Dichloroethene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034196			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034196			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034196			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034196			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034196			71-36-3	1-Butanol	NGS	120	<6.9	2.4E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELY
S16T034196			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034196			71-23-8	1-Propanol	NGS	120	7.2	94	n/a	n/a	n/a	n/a	3.0	n/a	B
S16T034196			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034196			1708-29-5	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034196			78-93-3	2-Butanone	NGS	110	<1.9	7.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034196			110-43-0	2-Heptanone	NGS	96	<1.6	5.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034196			591-78-6	2-Hexanone	NGS	98	<1.2	3.7	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034196			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034196			78-94-4	3-Buten-2-one	NGS	100	<1.7	6.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034196			106-35-4	3-Heptanone	NGS	100	<1.5	6.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034196			105-98-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034196			105-42-0	4-Methyl-2-hexanone	NGS	98	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034196			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	4.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034196			67-64-1	Acetone	NGS	97	<4.3	300	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034196			75-05-8	Acetonitrile	NGS	91	<1.8	30	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034196			98-84-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034196			1007-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034196			1007-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

Y - Comment  
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 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-B  
 Customer Sample ID: 16-08635-2-IN-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034196			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034196			71-43-2	Benzene	NGS	110	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T034196			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034196			123-72-8	Buzanal	NGS	110	<2.1	17	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T034196			109-74-0	Butanenitril	NGS	100	<1.2	1.7	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T034196			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034196			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034196			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034196			57-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034196			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T034196			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034196			64-17-5	Ethanol	NGS	100	<7.4	200	n/a	n/a	n/a	n/a	7.4	n/a	n/a
S16T034196			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034196			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034196			110-60-9	Furan	NGS	100	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034196			110-54-3	Hexane	NGS	100	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034196			828-73-9	Hexamethylnitro	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034196			126-58-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034196			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a U
S16T034196			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a U
S16T034196			98-86-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034196			110-59-8	Peracetic Acid	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034196			107-12-0	Propanenitrile	NGS	100	<1.4	2.8	n/a	n/a	n/a	n/a	1.4	n/a	n/a J
S16T034196			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a U
S16T034196			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034196			127-18-4	Tetrachloroethene	NGS	120	<1.6	49	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034196			108-88-3	Toluene	NGS	110	<1.5	7.4	n/a	n/a	n/a	n/a	1.5	n/a	n/a J

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 J - Estimated  
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 c - RPD Outside Range  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-B  
 Customer Sample ID: 16-08635-2-IN-B

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034196			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034196			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	23	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034196			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034196			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034196			142-82-5	n-Heptane	NGS	100	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	
S16T034196			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-C  
 Customer Sample ID: 16-08635-2-IN-C

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T034197			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
S16T034197			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a/U
S16T034197			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U
S16T034197			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
S16T034197			107-06-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S16T034197			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2		n/a/U
S16T034197			106-66-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a/U
S16T034197			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a/U
S16T034197			71-36-3	1-Butanol	NGS	120	<8.9	2.2E+03	n/a	n/a	n/a	n/a	8.9		n/a/E/L
S16T034197			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a/L
S16T034197			71-23-6	1-Prepanol	NGS	120	7.2	93	n/a	n/a	n/a	n/a	3.0		n/a/B
S16T034197			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
S16T034197			1706-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a/U
S16T034197			78-93-3	2-Butanone	NGS	110	<1.9	8.5	n/a	n/a	n/a	n/a	1.9		n/a/J
S16T034197			110-43-0	2-Heptanone	NGS	99	<1.6	7.1	n/a	n/a	n/a	n/a	1.6		n/a/J
S16T034197			591-78-6	2-Hexanone	NGS	96	<1.2	3.6	n/a	n/a	n/a	n/a	1.2		n/a/J
S16T034197			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a/U
S16T034197			78-94-4	3-Buten-2-one	NGS	100	<1.7	6.5	n/a	n/a	n/a	n/a	1.7		n/a/U
S16T034197			106-35-4	3-Heptanone	NGS	100	<1.5	7.8	n/a	n/a	n/a	n/a	1.5		n/a/J
S16T034197			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S16T034197			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
S16T034197			108-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	3.0	n/a	n/a	n/a	n/a	1.9		n/a/J
S16T034197			57-64-1	Acetone	NGS	97	<4.3	300	n/a	n/a	n/a	n/a	4.3		n/a/J
S16T034197			75-05-8	Acetonitrile	NGS	91	<1.8	29	n/a	n/a	n/a	n/a	1.8		n/a/J
S16T034197			56-86-2	Acetophenone	NGS	100	<2.6	3.6	n/a	n/a	n/a	n/a	2.6		n/a/J
S16T034197			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a/U
S16T034197			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a/U

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 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-C  
 Customer Sample ID: 16-08635-2-IN-C

Sample#	R	MF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034197			107-05-1	Methyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034197			71-43-2	Benzene	NGS	110	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T034197			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034197			123-73-8	BuTanal	NGS	110	<2.1	2.3	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T034197			109-74-0	BuZanenitrile	NGS	100	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T034197			55-23-5	Carbon tetrachloride	NGS	130	<1.5	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034197			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034197			73-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034197			87-68-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034197			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T034197			124-19-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034197			64-17-5	Ethanol	NGS	100	<7.4	190	n/a	n/a	n/a	n/a	7.4	n/a	n/a
S16T034197			141-79-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034197			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034197			110-09-9	Furan	NGS	100	<1.5	1.3	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034197			110-54-3	Hexane	NGS	100	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034197			528-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034197			126-88-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034197			75-09-2	Methylene Chloride	NGS	100	<2.7	2.8	n/a	n/a	n/a	n/a	2.7	n/a	n/a J
S16T034197			81-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a U
S16T034197			98-85-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034197			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034197			107-12-0	Propanenitrile	NGS	100	<1.4	2.7	n/a	n/a	n/a	n/a	1.4	n/a	n/a J
S16T034197			110-86-1	Pyridine	NGS	100	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a U
S16T034197			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034197			127-18-4	Tetrachloroethene	NGS	120	<1.6	36	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034197			108-88-3	Toluene	NGS	110	<1.5	5.4	n/a	n/a	n/a	n/a	1.5	n/a	n/a J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-C  
 Customer Sample ID: 16-08635-2-IN-C

Sample#	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034197			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034197			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	21	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034197			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034197			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034197			142-92-5	n-Heptane	NGS	100	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	
S16T034197			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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B - Blank Contamination  
 U - Less Than Detection Limit

J - Estimated  
 L - LLS Outside Range

NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162969  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-D  
 Customer Sample ID: 16-08635-2-IN-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Corr Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T034198			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034198			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T034198			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T034198			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034198			107-06-2	1,2-Dichloroethane	NGS	120	<1.5	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034198			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T034198			108-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T034198			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034198			71-36-3	1-Butanol	NGS	120	<8.9	2.3E+03	n/a	n/a	n/a	n/a	8.9	n/a	n/a ELY
S16T034198			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a LU
S16T034198			71-23-8	1-Propanol	NGS	120	7.2	87	n/a	n/a	n/a	n/a	3.0	n/a	n/a B
S16T034198			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T034198			1706-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034198			28-83-3	2-Butanone	NGS	110	<1.9	6.1	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T034198			110-43-0	2-Heptanone	NGS	99	<1.6	5.3	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T034198			591-78-6	2-Hexanone	NGS	98	<1.2	3.0	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T034198			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034198			28-84-4	3-Buten-2-one	NGS	100	<1.7	6.5	n/a	n/a	n/a	n/a	1.7	n/a	n/a J
S16T034198			106-35-4	3-Heptanone	NGS	100	<1.5	5.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a J
S16T034198			106-69-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T034198			105-42-0	4-Methyl-2-pentanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034198			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	3.3	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T034198			87-64-1	Acetone	NGS	97	<4.3	300	n/a	n/a	n/a	n/a	4.3	n/a	n/a
S16T034198			75-05-8	Acetonitrile	NGS	91	<1.8	43	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034198			98-86-2	Acetophenone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034198			107-13-1	Acrylonitrile	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034198			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U

Y - Contaminant  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162969  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-D  
 Customer Sample ID: 16-08635-2-IN-D

Sample#	R	M	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034198			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034198			71-43-2	Benzene	NGS	110	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034198			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034198			123-72-8	Butanal	NGS	110	<2.1	14	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034198			109-74-0	Butanenitrile	NGS	100	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034198			59-23-5	Carbon tetrachloride	NGS	130	<1.5	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034198			87-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034198			124-18-5	Decane	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034198			64-17-5	Ethanol	NGS	100	<7.4	170	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T034198			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			110-00-9	Furan	NGS	100	<1.6	21	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			110-54-3	Hexane	NGS	100	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034198			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034198			81-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T034198			88-85-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034198			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			107-12-0	Propanenitrile	NGS	100	<1.4	2.8	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034198			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T034198			100-42-5	Styrene	NGS	110	<1.6	1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034198			127-18-4	Tetrachloroethene	NGS	120	<1.6	29	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			106-88-3	Toluene	NGS	110	<1.5	4.6	n/a	n/a	n/a	n/a	1.5	n/a	J

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-D  
 Customer Sample ID: 16-08635-2-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034198			79-01-6	Trichloroethane	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034198			75-09-4	Trichlorofluoromethane	NGS	110	<1.6	20	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034198			10001-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034198			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034198			142-82-5	n-Heptane	NGS	100	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034198			10001-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment  
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 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162969  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-E  
 Customer Sample ID: 16-08635-2-IN-E

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cal Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034199			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034199			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034199			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034199			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034199			107-05-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034199			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034199			106-45-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034199			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034199			71-36-3	1-Butanol	NGS	120	<3.9	2.4E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELY
S16T034199			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034199			71-23-8	1-Propanol	NGS	120	7.2	83	n/a	n/a	n/a	n/a	3.0	n/a	B
S16T034199			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034199			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034199			76-93-3	2-Butanone	NGS	110	<1.9	6.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034199			110-43-0	2-Heptanone	NGS	99	<1.6	5.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034199			591-78-6	2-Hexanone	NGS	96	<1.2	3.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034199			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034199			76-94-4	3-Buten-2-one	NGS	100	<1.7	5.4	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034199			105-35-4	3-Heptanone	NGS	100	<1.5	5.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034199			105-65-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034199			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034199			103-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	2.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034199			57-64-1	Acetone	NGS	97	<4.3	240	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T034199			75-05-8	Acetonitrile	NGS	91	<1.8	11	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034199			98-86-2	Acetophenone	NGS	100	<2.6	3.4	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034199			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034199			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

Y - Comment  
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 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPO Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-E  
 Customer Sample ID: 16-08635-2-IN-E

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034199			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034199			71-43-2	Benzene	NGS	110	<1.2	1.6	n/a	n/a	n/a	n/a	1.2		n/a J
S16T034199			103-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034199			123-72-8	Butanal	NGS	110	<2.1	14	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034199			109-74-0	Butanenitrile	NGS	100	<1.2	1.5	n/a	n/a	n/a	n/a	1.2		n/a J
S16T034199			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			103-93-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034199			87-68-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034199			126-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034199			64-17-5	Ethanol	NGS	100	<7.4	170	n/a	n/a	n/a	n/a	7.4		n/a U
S16T034199			141-78-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			110-00-9	Furan	NGS	100	<1.6	14	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			110-54-3	Hexane	NGS	100	<1.7	14	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034199			528-73-9	Hexamethylenetetramine	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034199			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034199			56-55-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034199			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			107-12-0	Propanenitrile	NGS	100	<1.4	2.4	n/a	n/a	n/a	n/a	1.4		n/a J
S16T034199			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034199			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			127-18-4	Tetrachloroethene	NGS	120	<1.6	22	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034199			108-88-3	Toluene	NGS	110	<1.5	5.2	n/a	n/a	n/a	n/a	1.5		n/a U

Y - Comment  
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 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-E  
 Customer Sample ID: 16-08635-2-IN-E

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cet Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034199			73-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034199			75-69-4	Trichlorofluoromethane	NGS	110	<1.5	20	n/a	n/a	n/a	n/a	1.5		n/a
S16T034199			10051-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034199			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034199			142-82-5	n-Heptane	NGS	100	<1.4	14	n/a	n/a	n/a	n/a	1.4		n/a
S16T034199			10051-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - LLS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-F  
 Customer Sample ID: 16-08635-2-IN-F

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc %	Qual Flags
VAPOR:TDU VOA #2															
S16T034200			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034200			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034200			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034200			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034200			107-05-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034200			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034200			105-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034200			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034200			71-35-3	1-Butanol	NGS	120	<8.9	2.3E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELV
S16T034200			111-70-6	1-Heptanol	NGS	83	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T034200			71-23-8	1-Propanol	NGS	120	7.2	85	n/a	n/a	n/a	n/a	3.0	n/a	LU
S16T034200			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034200			1709-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034200			76-93-3	2-Butanone	NGS	110	<1.9	0.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034200			110-43-0	2-Heptanone	NGS	99	<1.5	4.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034200			591-78-6	2-Hexanone	NGS	98	<1.2	2.9	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034200			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034200			78-94-4	3-Buten-2-one	NGS	100	<1.7	5.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034200			106-35-4	3-Heptanone	NGS	100	<1.5	4.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034200			108-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034200			105-42-0	4-Methyl-2-hexanone	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034200			108-10-1	4-Methyl-2-pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034200			67-64-1	Acetone	NGS	97	<4.3	230	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034200			75-05-8	Acetonitrile	NGS	91	<1.8	9.1	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034200			89-86-2	Acetophenone	NGS	100	<2.5	5.2	n/a	n/a	n/a	n/a	2.5	n/a	J
S16T034200			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034200			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

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 c - RPD Outside Range  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-F  
 Customer Sample ID: 16-08635-2-IN-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034200			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034200			71-43-2	Benzene	NGS	110	<1.2	1.4	n/a	n/a	n/a	n/a	1.2		n/a J
S16T034200			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034200			123-72-8	Butanal	NGS	110	<2.1	15	n/a	n/a	n/a	n/a	2.1		n/a
S16T034200			109-74-0	Butanenitrile	NGS	100	<1.2	1.5	n/a	n/a	n/a	n/a	1.2		n/a J
S16T034200			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034200			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034200			87-68-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034200			124-19-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034200			84-17-5	Ethanol	NGS	100	<7.4	160	n/a	n/a	n/a	n/a	7.4		n/a
S16T034200			141-79-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			110-00-9	Furan	NGS	100	<1.6	14	n/a	n/a	n/a	n/a	1.6		n/a
S16T034200			110-54-3	Hexane	NGS	100	<1.7	14	n/a	n/a	n/a	n/a	1.7		n/a
S16T034200			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			126-99-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034200			75-09-2	Methylen Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034200			81-20-3	Naphtalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T034200			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034200			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034200			107-12-0	Propanenitrile	NGS	100	<1.4	2.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034200			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T034200			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034200			127-18-4	Tetrachloroethane	NGS	120	<1.6	14	n/a	n/a	n/a	n/a	1.6		n/a
S16T034200			109-88-3	Toluene	NGS	110	<1.5	4.1	n/a	n/a	n/a	n/a	1.5		n/a J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-F  
 Customer Sample ID: 16-08635-2-IN-F

Sample#	R	Alt	CAIS #	Analyte	Unit	STD %	Blank	Res:R	Duplicate	Average	RPD %	Spl Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034200			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034200			75-09-4	Trichlorofluoromethane	NGS	110	<1.5	20	n/a	n/a	n/a	n/a	1.6		n/a
S16T034200			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034200			123-66-4	n-Butyl acetate	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034200			142-62-5	n-Heptane	NGS	100	<1.4	13	n/a	n/a	n/a	n/a	1.4		n/a
S16T034200			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-G  
 Customer Sample ID: 16-08635-2-IN-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
S16T034201			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034201			79-00-5	1,1,2-Trichloroethane	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034201			75-34-3	1,1-Dichloroethane	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034201			75-35-4	1,1-Dichloroethane	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034201			107-05-2	1,2-Dichloroethane	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034201			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T034201			106-46-7	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034201			123-91-1	1,4-Dioxane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034201			71-35-3	1-Butanol	NGS	120	<5.9	2.5E+03	n/a	n/a	n/a	n/a	8.9	n/a	ELY
S16T034201			111-70-6	1-Heptanol	NGS	83	<5.8	<5.8	n/a	n/a	n/a	n/a	5.8	n/a	U
S16T034201			71-23-8	1-Propanol	NGS	120	7.2	100	n/a	n/a	n/a	n/a	3.0	n/a	B
S16T034201			108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034201			1709-29-8	2,5-Dihydrofuran	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	Uc
S16T034201			78-93-3	2-Butanone	NGS	110	<1.9	6.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034201			110-43-0	2-Heptanone	NGS	99	<1.5	5.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			501-78-6	2-Hexanone	NGS	98	<1.2	3.1	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034201			534-22-5	2-Methylfuran	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034201			78-94-4	3-Buten-2-one	NGS	100	<1.7	5.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034201			106-35-4	3-Heptanone	NGS	100	<1.5	5.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			106-68-3	3-Octanone	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034201			105-42-0	4-Methyl-2-pentanone	NGS	98	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034201			108-10-1	4-Methyl-2-Pentanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034201			67-64-1	Acetone	NGS	97	<4.3	3.0	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034201			75-05-8	Acetonitrile	NGS	91	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034201			89-86-2	Acetophenone	NGS	100	<2.5	3.8	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034201			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034201			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	Uc

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-G  
 Customer Sample ID: 16-08635-2-IN-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T034201			107-05-1	Allyl Chloride	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T034201			71-43-2	Benzene	NGS	110	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034201			100-47-0	Benzonitrile	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034201			123-72-8	Butanal	NGS	110	<2.1	1.3	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T034201			109-74-0	Butanenitrile	NGS	100	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T034201			56-23-5	Carbon tetrachloride	NGS	130	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034201			67-66-3	Chloroform	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			110-82-7	Cyclohexane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034201			124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T034201			64-17-5	Ethanol	NGS	100	<7.4	1.0	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T034201			141-79-6	Ethyl acetate	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			100-41-4	Ethylbenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			110-00-9	Furan	NGS	100	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			110-54-3	Hexane	NGS	100	<1.7	1.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T034201			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034201			126-66-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T034201			91-20-3	Naphthalene	NGS	110	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	J
S16T034201			98-95-3	Nitrobenzene	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034201			110-59-8	Pentanenitrile	NGS	97	<1.4	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			107-12-0	Propanenitrile	NGS	100	<1.4	2.9	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T034201			110-85-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T034201			100-42-5	Styrene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			127-18-4	Tetrachloroethene	NGS	120	<1.5	1.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034201			108-88-3	Toluene	NGS	110	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162989  
 SDG Number:  
 Customer Sample ID: 16-08635-2-IN-G  
 Customer Sample ID: 16-08635-2-IN-G

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Chk Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034201			79-01-6	Trichloroethene	NGS	120	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T034201			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	21	n/a	n/a	n/a	n/a	1.6		n/a
S16T034201			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034201			123-86-4	n-Butyl acetate	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034201			142-83-5	n-Heptane	NGS	100	<1.4	13	n/a	n/a	n/a	n/a	1.4		n/a U
S16T034201			10051-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

Y - Comment  
 E - Outside Calibration Range  
 B - Blank Contamination  
 U - Less Than Detection Limit  
 J - Estimated  
 L - ULS Outside Range  
 NA = Not Analyzed, ND = Not Detected  
 c - RPD Outside Range

*Genevieve Joyce*  
 11/17/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162590  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-A  
 Customer Sample ID: 16-08636-2-EFF-A

Sample#	K	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034202			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034202			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034202			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034202			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034202			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034202			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034202			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034202			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034202			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034202			71-23-8	1-Propanol	NGS	120	<8.9	27	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034202			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034202			1706-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034202			78-83-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T034202			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034202			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034202			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034202			78-84-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034202			106-35-4	3-Heptanone	NGS	94	<2.7	2.8	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034202			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034202			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034202			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034202			67-84-1	Acetone	NGS	91	4.4	5.2	n/a	n/a	n/a	n/a	2.8	n/a	BJ
S16T034202			75-05-8	Acetonitrile	NGS	98	<1.6	190	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034202			98-88-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034202			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034202			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-A  
 Customer Sample ID: 16-08636-2-EFF-A

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034202			107-06-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034202			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034202			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034202			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034202			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034202			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034202			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034202			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034202			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034202			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034202			64-17-5	Ethanol	NGS	120	6.6	38	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034202			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034202			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034202			110-54-3	Hexane	NGS	100	1.5	1.6	n/a	n/a	n/a	n/a	1.3	n/a	BU
S16T034202			828-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034202			125-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			75-09-2	Methylene Chloride	NGS	110	4.2	4.1	n/a	n/a	n/a	n/a	4.1	n/a	BU
S16T034202			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034202			98-85-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034202			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034202			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			110-85-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034202			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034202			127-18-4	Tetrachloroethene	NGS	99	<1.8	28	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			108-88-3	Toluene	NGS	98	<2.2	5.0	n/a	n/a	n/a	n/a	2.2	n/a	U

T - Tentatively Identified Compound  
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 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-A  
 Customer Sample ID: 16-08636-2-EFF-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Resist	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034202			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034202			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034202			10081-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034202			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034202			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034202			10081-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

NA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-B

Customer Sample ID: 16-08636-2-EFF-B

Sample#	R	AJ	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crct Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034203			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			79-60-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			71-38-3	1-Butanol	NGS	120	<4.3	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			111-70-6	1-Heptanol	NGS	90	<8.1	<8.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			71-23-8	1-Propanol	NGS	120	<8.9	19	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			78-83-3	2-Butanone	NGS	93	<3.1	3.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			78-94-4	3-Butan-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			106-88-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			87-84-1	Acetone	NGS	91	4.4	6.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			75-05-8	Acetonitrile	NGS	96	<1.6	280	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			98-88-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			107-13-1	Azylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034203			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination

E - Outside Calibration Range

J - Estimated

U - Less Than Detection Limit

T - Tentatively Identified Compound

N - Named TIC



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162590

SDG Number:

Customer Sample ID: 16-08636-2-EFF-B

Customer Sample ID: 16-08636-2-EFF-B

Sample#	R	AJ	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034203			107-06-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034203			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034203			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034203			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034203			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034203			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034203			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034203			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034203			87-86-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034203			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034203			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034203			84-17-5	Ethanol	NGS	120	6.6	37	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034203			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034203			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034203			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034203			110-54-3	Hexane	NGS	100	1.5	1.9	n/a	n/a	n/a	n/a	1.3	n/a	BU
S16T034203			828-73-9	Hexamethylenimine	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034203			126-99-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034203			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034203			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034203			88-06-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034203			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034203			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034203			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034203			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034203			127-18-4	Tetrachloroethene	NGS	99	<1.8	31	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034203			108-88-3	Toluene	NGS	98	<2.2	6.8	n/a	n/a	n/a	n/a	2.2	n/a	J

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-B

Customer Sample ID: 16-08636-2-EFF-B

Sample#	R	AB	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034203			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/b	n/b	n/b	n/b	1.6	n/a	U
S161034203			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/b	n/b	n/b	n/b	1.9	n/a	U
S161034203			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.6	<1.6	n/b	n/b	n/b	n/b	1.6	n/a	U
S161034203			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/b	n/b	n/b	n/b	2.4	n/a	U
S161034203			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/b	n/b	n/b	n/b	1.6	n/a	U
S161034203			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/b	n/b	n/b	n/b	2.1	n/a	U

NA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-C  
 Customer Sample ID: 16-08636-2-EFF-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034204		79-34-5		1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S16T034204		79-00-5		1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a
S16T034204		75-34-3		1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034204		75-35-4		1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034204		107-06-2		1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034204		54-75-6		1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034204		106-46-7		1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S16T034204		123-91-1		1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
S16T034204		71-36-3		1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	n/a
S16T034204		111-70-6		1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a
S16T034204		71-23-8		1-Propanol	NGS	120	<8.9	27	n/a	n/a	n/a	n/a	8.9	n/a	n/a
S16T034204		108-47-4		2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S16T034204		1708-26-8		2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S16T034204		78-93-3		2-Butanone	NGS	93	<3.1	3.6	n/a	n/a	n/a	n/a	3.1	n/a	n/a
S16T034204		110-43-0		2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034204		591-78-5		2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
S16T034204		534-22-5		2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S16T034204		78-94-4		3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
S16T034204		106-35-4		3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
S16T034204		109-66-3		3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S16T034204		105-42-0		4-Methyl-2-Pentanone	NGS	90	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034204		108-10-1		4-Methyl-2-Pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S16T034204		67-64-1		Acetone	NGS	91	4.4	18	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T034204		75-05-8		Acetonitrile	NGS	98	<1.6	230	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034204		86-86-2		Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	n/a
S16T034204		107-13-1		Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T034204		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-C  
 Customer Sample ID: 16-08636-2-EFF-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Conc Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034204			107-65-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S161034204			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S161034204			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S161034204			123-72-6	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S161034204			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S161034204			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S161034204			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S161034204			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S161034204			87-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S161034204			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S161034204			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S161034204			84-17-5	Ethanol	NGS	120	6.6	50	n/a	n/a	n/a	n/a	3.7	n/a	B
S161034204			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S161034204			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S161034204			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S161034204			110-54-3	Hexane	NGS	100	1.5	1.4	n/a	n/a	n/a	n/a	1.3	n/a	BU
S161034204			828-73-8	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S161034204			126-58-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S161034204			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S161034204			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S161034204			98-85-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S161034204			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S161034204			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S161034204			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S161034204			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S161034204			127-18-4	Tetrachloroethene	NGS	99	<1.8	35	n/a	n/a	n/a	n/a	1.8	n/a	U
S161034204			108-88-3	Toluene	NGS	98	<2.2	3.7	n/a	n/a	n/a	n/a	2.2	n/a	J

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 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162390  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-C  
 Customer Sample ID: 16-08636-2-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034204			79-01-6	Trichloroethene	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034204			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034204			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034204			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034204			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034204			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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 B - Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-D  
 Customer Sample ID: 16-08636-2-EFF-D

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034205			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			75-35-4	1,2-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			111-70-8	1-Hexanol	NGS	90	<8.1	<8.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			71-23-8	1-Propanol	NGS	120	<8.9	4.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			106-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			78-93-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			78-94-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			67-64-1	Acetone	NGS	91	4.4	13	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			75-05-8	Acetonitrile	NGS	98	<1.6	43	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			98-86-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T034205			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 MA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162950  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-D  
 Customer Sample ID: 16-08636-2-EFF-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034205			107-05-1	Alyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034205			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034205			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034205			125-72-8	Subanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034205			109-74-0	Subanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034205			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034205			106-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034205			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034205			87-68-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034205			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034205			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034205			64-17-5	Ethanol	NGS	120	8.6	8.6	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034205			541-76-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034205			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034205			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034205			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034205			628-73-9	Hexamethylenetriamine	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034205			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034205			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034205			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034205			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034205			110-59-8	Perfluorobenzene	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034205			107-12-0	Propenenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034205			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034205			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034205			127-18-4	Tetrachloroethene	NGS	99	<1.8	2.7	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034205			108-88-3	Toluene	NGS	98	<2.2	2.7	n/a	n/a	n/a	n/a	2.2	n/a	U

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 N - Named TIC  
 J - Estimated  
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 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-D  
 Customer Sample ID: 16-08636-2-EFF-D

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034205			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S161034205			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a/U
S161034205			10061-91-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S161034205			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S161034205			142-82-5	n-Hexane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S161034205			10061-92-8	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a/U

T - Tentatively Identified Compound  
 N - Named TIC

J - Estimated  
 U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-E  
 Customer Sample ID: 16-08636-2-EFF-E

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T034206			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034206			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034206			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034206			75-35-4	1,2-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034206			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034206			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034206			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034206			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034206			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034206			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034206			71-23-8	1-Propanol	NGS	120	<8.9	25	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034206			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034206			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034206			78-83-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T034206			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034206			991-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034206			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034206			78-84-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034206			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034206			109-69-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034206			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034206			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034206			67-64-1	Acetone	NGS	91	4.4	5.7	n/a	n/a	n/a	n/a	2.8	n/a	BU
S16T034206			75-05-8	Acetonitrile	NGS	98	<1.6	310	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034206			98-86-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034206			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034206			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-E

Customer Sample ID: 16-08636-2-EFF-E

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034206			107-05-1	Alyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	2.5	n/a/U
S16T034206			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a/U
S16T034206			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	n/a	4.2	n/a/U
S16T034206			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a/U
S16T034206			100-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a/U
S16T034206			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a/U
S16T034206			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	2.5	n/a/U
S16T034206			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a/U
S16T034206			67-68-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
S16T034206			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a/U
S16T034206			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a/U
S16T034206			64-17-5	Ethanol	NGS	120	8.8	94	n/a	n/a	n/a	n/a	n/a	3.7	n/a/B
S16T034206			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
S16T034206			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a/U
S16T034206			110-90-9	Furan	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
S16T034206			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a/U
S16T034206			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a/U
S16T034206			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
S16T034206			75-08-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	n/a	4.1	n/a/U
S16T034206			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	n/a	5.3	n/a/U
S16T034206			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	n/a	4.7	n/a/U
S16T034206			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a/U
S16T034206			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a/U
S16T034206			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a/U
S16T034206			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a/U
S16T034206			127-18-4	Tetrachloroethene	NGS	98	<1.8	17	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S16T034206			108-88-3	Toluene	NGS	98	<2.2	2.2	n/a	n/a	n/a	n/a	n/a	2.2	n/a/J

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-E

Customer Sample ID: 16-08636-2-EFF-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034206			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034206			75-69-4	Trichlorofluoromethane	NGS	80	<1.9	3.6	n/a	n/a	n/a	n/a	1.9		n/a J
S16T034206			10081-01-5	dis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034206			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034206			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034206			10081-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U

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 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-F  
 Customer Sample ID: 16-08636-2-EFF-F

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU NCA #2															
S16T034207			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034207			79-09-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034207			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034207			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034207			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034207			842-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034207			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034207			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034207			111-70-8	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034207			71-23-3	1-Propanol	NGS	120	<8.9	21	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034207			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034207			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034207			78-93-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T034207			119-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034207			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034207			834-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034207			78-94-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034207			166-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034207			166-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034207			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034207			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034207			67-64-1	Acetone	NGS	91	4.4	9.8	n/a	n/a	n/a	n/a	2.8	n/a	BJ
S16T034207			75-05-8	Acetonitrile	NGS	98	<1.6	390	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034207			98-86-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034207			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034207			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-F  
 Customer Sample ID: 16-08636-2-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034207			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034207			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034207			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034207			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034207			108-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034207			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034207			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034207			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034207			87-68-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034207			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034207			64-17-5	Ethanol	NGS	120	6.6	150	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034207			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034207			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034207			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034207			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034207			128-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034207			91-20-3	Napthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034207			88-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034207			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034207			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034207			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034207			127-18-4	Tetrachloroethene	NGS	99	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034207			108-68-3	Toluene	NGS	98	<2.2	2.2	n/a	n/a	n/a	n/a	2.2	n/a	J

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 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-F

Customer Sample ID: 16-08636-2-EFF-F

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034207			79-01-6	Trichloroethene	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034207			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	13	n/a	n/a	n/a	n/a	1.9		n/a
S16T034207			10081-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034207			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034207			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034207			16081-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U

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J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-G  
 Customer Sample ID: 16-08636-2-EFF-G

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Out Err %	Qual Flag
VAPOR-TDU VOA #2															
S16T034208			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034208			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034208			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034208			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034208			107-05-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034208			842-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034208			123-81-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034208			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T034208			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034208			71-23-8	1-Propanol	NGS	120	<8.9	33	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034208			108-47-4	2,4-Diaminopyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034208			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034208			78-83-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T034208			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034208			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034208			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034208			78-84-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T034208			108-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034208			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034208			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034208			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034208			57-84-1	Acetone	NGS	91	4.4	33	n/a	n/a	n/a	n/a	2.8	n/a	B
S16T034208			75-05-8	Acetonitrile	NGS	96	<1.6	30	n/a	n/a	n/a	n/a	1.6	n/a	B
S16T034208			98-96-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034208			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034208			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-G  
 Customer Sample ID: 16-09636-2-EFF-G

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR-TDU VCA #2															
S16T034208			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034208			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034208			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034208			123-72-8	Buzanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034208			109-74-0	Buzanitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034208			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034208			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034208			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034208			87-68-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034208			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034208			84-17-5	Ethanol	NGS	120	6.6	230	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034208			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034208			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034208			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034208			828-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034208			125-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034208			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034208			58-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034208			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034208			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			110-88-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034208			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034208			127-18-4	Tetrachloroethene	NGS	99	<1.8	13	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			108-88-3	Toluene	NGS	98	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890

SDG Number:

Customer Sample ID: 16-08636-2-EFF-G

Customer Sample ID: 16-09636-2-EFF-G

Sample	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VCA #2															
S16T034208			79-01-6	Trichloroethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034208			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	23	n/a	n/a	n/a	n/a	1.9	n/a	
S16T034208			10581-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034208			123-88-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034208			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034208			10581-02-8	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162390

SDG Number:

Customer Sample ID: 16-08636-2-EFF-H

Customer Sample ID: 16-08636-2-EFF-H

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cst Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034209		79-34-5		1,1,2,2-Tetrachloroethane	NGS	98	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S16T034209		79-00-5		1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a
S16T034209		75-34-3		1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034209		75-35-4		1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034209		107-496-2		1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T034209		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034209		106-46-7		1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S16T034209		123-91-1		1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a
S16T034209		71-36-3		1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	n/a
S16T034209		111-70-6		1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a
S16T034209		71-23-8		1-Propanol	NGS	120	<8.9	29	n/a	n/a	n/a	n/a	8.9	n/a	n/a
S16T034209		108-47-4		2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S16T034209		1708-29-8		2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S16T034209		78-93-3		2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a
S16T034209		110-43-0		2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034209		591-78-6		2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
S16T034209		534-22-5		2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S16T034209		78-94-4		3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
S16T034209		106-35-4		3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
S16T034209		166-68-3		3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S16T034209		105-42-0		4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034209		108-10-1		4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S16T034209		87-64-1		Acetone	NGS	91	4.4	85	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T034209		75-05-8		Acetonitrile	NGS	98	<1.6	1.7E+03	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034209		86-86-2		Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	n/a
S16T034209		107-13-1		Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T034209		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a

N/A = Not Analyzed, ND = Not Detected

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T - Tentatively Identified Compound

N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162390  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-H  
 Customer Sample ID: 16-08636-2-EFF-H

Sample#	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034209			107-65-1	AsM Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034209			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034209			100-47-0	Benzotrifluoride	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034209			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034209			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034209			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034209			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034209			75-40-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034209			87-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034209			124-18-5	Decane	NGS	98	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034209			84-17-5	Ethanol	NGS	120	6.6	260	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034209			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			100-41-4	Ethylbenzene	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034209			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034209			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034209			828-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034209			128-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034209			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034209			58-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034209			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034209			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034209			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034209			127-18-4	Tetrachloroethene	NGS	98	<1.8	11	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			108-88-3	Toluene	NGS	98	<2.2	2.5	n/a	n/a	n/a	n/a	2.2	n/a	U

N/A = Not Analyzed, ND = Not Detected

B - Blank Contamination

E - Outside Calibration Range

J - Estimated

U - Less Than Detection Limit

T - Tentatively Identified Compound

N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-H

Customer Sample ID: 16-08636-2-EFF-H

Sample#	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034209			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034209			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	22	n/a	n/a	n/a	n/a	1.9	n/a	
S16T034209			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034209			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034209			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034209			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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 B = Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-A  
 Customer Sample ID: 16-08636-2-IN-A

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034210			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			71-36-3	1-Butanol	NGS	120	<4.3	1.4E+03	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			111-70-6	1-Heptanol	NGS	90	<8.1	<8.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			71-23-8	1-Propanol	NGS	120	<8.9	170	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			78-83-3	2-Butanone	NGS	93	<3.1	7.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			110-43-0	2-Heptanone	NGS	94	<2.6	4.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			591-78-6	2-Hexanone	NGS	96	<2.5	2.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			78-94-4	3-Buten-2-one	NGS	91	<1.9	4.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			105-35-4	3-Heptanone	NGS	94	<2.7	4.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			105-88-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			67-64-1	Acetone	NGS	91	4.4	340	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			75-05-8	Acetonitrile	NGS	98	<1.6	240	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			98-88-2	Acetophenone	NGS	92	<5.2	<5.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S161034210			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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 E - Outside Calibration Range  
 B - Blank Contamination  
 MA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-A  
 Customer Sample ID: 16-09636-2-IN-A

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cal Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034210			107-06-1	AlM Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034210			71-43-2	Benzene	NGS	98	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034210			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034210			123-72-8	Buzanal	NGS	100	<3.0	11	n/a	n/a	n/a	n/a	3.0	n/a	
S16T034210			109-74-0	Buzanitrilo	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034210			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034210			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034210			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034210			87-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034210			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034210			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034210			84-17-5	Ethanol	NGS	120	6.6	270	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034210			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034210			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034210			110-00-9	Furan	NGS	90	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034210			110-54-3	Hexane	NGS	100	1.5	7.3	n/a	n/a	n/a	n/a	1.3	n/a	BU
S16T034210			828-73-9	Hexanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034210			128-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034210			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034210			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034210			58-85-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034210			110-59-6	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034210			107-12-0	Propionitrile	NGS	100	<1.8	2.3	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034210			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034210			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034210			127-18-4	Tetrachlorethene	NGS	99	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	
S16T034210			108-88-3	Toluene	NGS	98	<2.2	4.8	n/a	n/a	n/a	n/a	2.2	n/a	J

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-A  
 Customer Sample ID: 16-08636-2-IN-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VCA #2															
S16T034210			79-01-5	Trichloroethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034210			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	9.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034210			10081-01-5	dis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034210			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034210			142-82-5	n-Heptane	NGS	100	<1.6	9.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034210			10081-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-H  
 Customer Sample ID: 16-08636-2-IN-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034211			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034211			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034211			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034211			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034211			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034211			542-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	13	n/a	n/a	n/a	n/a	1.8	n/a	
S16T034211			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034211			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034211			71-36-3	1-Butanol	NGS	120	<4.3	1.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T034211			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034211			71-23-8	1-Propanol	NGS	120	<8.9	130	n/a	n/a	n/a	n/a	8.9	n/a	
S16T034211			106-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034211			1708-20-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034211			78-93-3	2-Butanone	NGS	93	<3.1	6.9	n/a	n/a	n/a	n/a	3.1	n/a	J
S16T034211			110-43-0	2-Heptanone	NGS	94	<2.6	5.1	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034211			591-78-6	2-Hexanone	NGS	96	<2.6	3.3	n/a	n/a	n/a	n/a	2.5	n/a	J
S16T034211			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034211			78-94-4	3-Buten-2-one	NGS	91	<1.9	5.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034211			106-35-4	3-Heptanone	NGS	94	<2.7	4.2	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T034211			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034211			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034211			169-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034211			67-64-1	Acetone	NGS	91	4.4	230	n/a	n/a	n/a	n/a	2.8	n/a	B
S16T034211			75-05-8	Acetonitrile	NGS	98	<1.6	640	n/a	n/a	n/a	n/a	1.6	n/a	E
S16T034211			98-88-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034211			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034211			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 B - Blank Contamination  
 NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-IN-H

Customer Sample ID: 16-08636-2-IN-H

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034211			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	2.5	n/a U
S16T034211			71-43-2	Benzene	NGS	98	<1.5	2.4	n/a	n/a	n/a	n/a	n/a	1.5	n/a J
S16T034211			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	n/a	4.2	n/a U
S16T034211			123-72-8	Benzal	NGS	100	<3.0	13	n/a	n/a	n/a	n/a	n/a	3.0	n/a
S16T034211			109-74-0	Bucanitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a U
S16T034211			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T034211			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	2.5	n/a U
S16T034211			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T034211			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a U
S16T034211			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a U
S16T034211			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T034211			64-17-5	Ethanol	NGS	120	6.6	220	n/a	n/a	n/a	n/a	n/a	3.7	n/a B
S16T034211			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a U
S16T034211			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T034211			110-00-9	Furan	NGS	90	<1.6	11	n/a	n/a	n/a	n/a	n/a	1.6	n/a J
S16T034211			110-54-3	Hexane	NGS	100	1.5	10	n/a	n/a	n/a	n/a	n/a	1.3	n/a BU
S16T034211			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a U
S16T034211			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a U
S16T034211			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	n/a	4.1	n/a U
S16T034211			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	n/a	5.3	n/a U
S16T034211			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	n/a	4.7	n/a U
S16T034211			110-59-8	Pentanitrile	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a U
S16T034211			107-12-0	Propanenitrile	NGS	100	<1.8	2.6	n/a	n/a	n/a	n/a	n/a	1.8	n/a J
S16T034211			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T034211			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a U
S16T034211			127-18-4	Tetrachloroethane	NGS	99	<1.8	5.2	n/a	n/a	n/a	n/a	n/a	1.8	n/a J
S16T034211			108-88-3	Toluene	NGS	96	<2.2	5.1	n/a	n/a	n/a	n/a	n/a	2.2	n/a J

NA = Not Analyzed, ND = Not Detected

B - Blank Contamination

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162890  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-H  
 Customer Sample ID: 16-09636-2-IN-H

Sample#	R	AF	CAS #	Analys	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034211			79-01-6	Trichloroethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034211			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	12	n/a	n/a	n/a	n/a	1.9	n/a	
S16T034211			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	8.1	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034211			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034211			142-82-5	n-Heptane	NGS	100	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034211			10051-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	4.7	n/a	n/a	n/a	n/a	2.1	n/a	J

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J - Estimated  
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T - Tentatively Identified Compound  
 N - Named TIC

*John Dwyer*  
 11/17/16

**Cartridge Evaluation  
 Data Summary Report**

Sample Group: 20162990  
 SDG Number:

Customer Sample ID: 16-08636-2-EFF-A  
 Customer Sample ID: 16-08636-2-EFF-A

Sampled	R	AI	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034202				Unknown-1	-	7.85	NGS	110 JT	
S16T034202				Decane, 2,6,7-dimethyl-	52108-25-2	23.20	NGS	28 JNT	
S16T034202				Decane, 2,4,6-trimethyl-	52108-27-4	23.24	NGS	8.5 JNT	
S16T034202				Undecane	1120214	23.36	NGS	16 JNT	
S16T034202				Undecane, 2,6-dimethyl-	17301-23-4	23.60	NGS	11 JNT	
S16T034202				Unknown-2	-	23.78	NGS	85 JT	
S16T034202				Dodecane	112403	24.83	NGS	14 JNT	
S16T034202				Methanamine	160-97-0	25.74	NGS	18 JNT	
S16T034202				Benzothiazole	95-16-0	25.84	NGS	44 JNT	
S16T034202				Dodecane, 4,6-dimethyl-	51141728	25.94	NGS	12 JNT	
S16T034202				Tetradecane	528594	26.49	NGS	6.3 JNT	
S16T034202				Unknown-3	-	27.76	NGS	28 JT	
S16T034202				Unknown-4	-	27.83	NGS	28 JT	

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T - Tentatively Identified Compound  
 N - Named TIC

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-B  
 Customer Sample ID: 16-08636-2-EFF-B

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034203				Unknown-1	-	7.84	NGS	120 JT	
S16T034203				Decane, 2,4,6-trimethyl-	82108-27-4	23.24	NGS	6.7 JNT	
S16T034203				Undecane	1120214	23.36	NGS	16 JNT	
S16T034203				Unknown-2	-	23.78	NGS	92 JT	
S16T034203				Undecane, 2,6-dimethyl-	17301-23-4	24.83	NGS	15 JNT	
S16T034203				Methanamine	100-07-0	25.74	NGS	20 JNT	
S16T034203				Benzothiazole	96-16-9	25.85	NGS	49 JNT	
S16T034203				Dodecane, 4,8-dimethyl-	61141728	25.94	NGS	17 JNT	
S16T034203				Tetradecane	629594	28.49	NGS	10 JNT	
S16T034203				Unknown-3	-	27.77	NGS	34 JT	
S16T034203				Unknown-4	-	27.84	NGS	36 JT	

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 NA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-C

Customer Sample ID: 16-08636-2-EFF-C

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR: TDU VOA #2									
S16T034204				Unknown-1	-	7.84	NGS	130 JT	
S16T034204				Cyclohexane, octamethyl	556-67-2	18.86	NGS	30 JNT	
S16T034204				Decane, 2,4,6-trimethyl-	62108-27-4	23.36	NGS	12 JNT	
S16T034204				Unknown-2	-	23.78	NGS	110 JT	
S16T034204				Dodecane	112403	24.83	NGS	22 JNT	
S16T034204				Methanamine	100-97-0	25.73	NGS	71 JNT	
S16T034204				Benzothiazole	55-16-9	25.85	NGS	70 JNT	
S16T034204				Dodecane, 4,6-dimethyl-	61141728	25.94	NGS	15 JNT	
S16T034204				Tetradecane	629094	28.49	NGS	9.7 JNT	

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J = Estimated  
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T = Tentatively Identified Compound  
 N = Named TIC

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-D  
 Customer Sample ID: 16-08636-2-EFF-D

Sample#	R	AB	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Quali Flags
VAPOR:TDCU VOA #2									
S16T034205				Unknown-1	-	7.62	NGS	97 JT	
S16T034205				Undecane	1120214	23.37	NGS	5.3 JNT	
S16T034205				Unknown-2	-	23.79	NGS	70 JT	
S16T034205				Dodecane	112-40-3	24.84	NGS	8.5 JNT	
S16T034205				Nethanamine	100-97-0	25.74	NGS	77 JNT	
S16T034205				Benzothiazole	95-16-8	25.86	NGS	50 JNT	
S16T034205				Dodecane, 4,6-dimethyl-	61141728	25.95	NGS	13 JNT	
S16T034205				Tetradecane	628-594	26.49	NGS	9.8 JNT	

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 NA = Not Analyzed, ND = Not Detected  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-E  
 Customer Sample ID: 16-08636-2-EFF-E

Sample#	R	M	CC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034206				Unknown-1	-	7.84	NGS	160 JT	
S16T034206				Unknown-2	-	23.76	NGS	55 JT	
S16T034206				Dodecane	112403	24.83	NGS	11 JNT	
S16T034206				Unknown-3	-	25.60	NGS	33 JT	
S16T034206				Methanamine	100-97-0	25.73	NGS	42 JNT	
S16T034206				Benzothiazole	95-16-9	25.84	NGS	46 JNT	
S16T034206				Dodecane, 4,6-dimethyl-	51141728	25.94	NGS	11 JNT	
S16T034206				Tetradecane	529594	26.49	NGS	8,3 JNT	

T - Tentatively Identified Compound  
 N - Named TIC  
 J - Estimated  
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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-F

Customer Sample ID: 16-08636-2-EFF-F

Sample#	R	AS	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034207				Unknown-1	-	7.84	NGS	140 JT	
S16T034207				Decane, 2,6-dimethyl-	82108-27-4	23.24	NGS	6.2 JNT	
S16T034207				Undecane	1120214	23.36	NGS	11 JNT	
S16T034207				Unknown-2	-	23.78	NGS	71 JT	
S16T034207				Dodecane	112403	24.83	NGS	16 JNT	
S16T034207				Methersaline	100-87-0	25.73	NGS	74 JNT	
S16T034207				Benzothiazole	95-16-9	25.84	NGS	49 JNT	
S16T034207				Dodecane, 4,6-dimethyl-	81141728	25.94	NGS	11 JNT	
S16T034207				Tetraecane	829505	28.49	NGS	6.5 JNT	

NA = Not Analyzed, ND = Not Detected  
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E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-EFF-G

Customer Sample ID: 16-08636-2-EFF-G

Sample#	R	AS	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034208				Unknown-1	-	7.86	NGS	180 JT	
S16T034208				Cyclohexane, octamethyl	558-87-2	19.85	NGS	83 JNT	
S16T034208				Decane, 3,7-dimethyl-	17312-54-8	22.42	NGS	120 JNT	
S16T034208				Decane, 2,4-dimethyl-	2801-84-5	22.58	NGS	45 JNT	
S16T034208				Undecane	1120-21-4	23.24	NGS	24 JNT	
S16T034208				Decane, 2,4,6-trimethyl-	82108-27-4	23.35	NGS	95 JNT	
S16T034208				Undecane, 4-methyl-	2980-69-0	23.47	NGS	50 JNT	
S16T034208				Undecane, 2-methyl-	7045718	23.60	NGS	19 JNT	
S16T034208				Unknown-2	-	23.78	NGS	98 JT	
S16T034208				Undecane, 3-methyl-	1002-43-3	24.47	NGS	9.7 JNT	
S16T034208				Dodecane	112-40-3	24.83	NGS	32 JNT	
S16T034208				Methanamine	100-87-0	25.73	NGS	120 JNT	
S16T034208				Dodecane, 4,6-dimethyl-	81141728	25.94	NGS	12 JNT	
S16T034208				Tridecane	829505	26.49	NGS	9.9 JNT	

MA = Not Analyzed, ND = Not Detected  
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J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 N - Named TIC

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990  
 SDG Number:  
 Customer Sample ID: 16-08636-2-EFF-H  
 Customer Sample ID: 16-08636-2-EFF-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034209				Unknown-1	-	7.84	NGS	150 JT	
S16T034209				Decane, 2,6,7-trimethyl-	62108-25-2	23.21	NGS	33 JNT	
S16T034209				Undecane	1120-21-4	23.36	NGS	22 JNT	
S16T034209				Undecane, 2,6-dimethyl-	17301-23-4	23.60	NGS	17 JNT	
S16T034209				Unknown-2	-	23.78	NGS	57 JT	
S16T034209				Decane, 2,4,6-trimethyl-	62108-27-4	23.93	NGS	24 JNT	
S16T034209				Dodecane	112403	24.84	NGS	12 JNT	
S16T034209				Methoxazine	100-97-0	25.74	NGS	180 JNT	
S16T034209				Benzothiazole	95-16-9	25.85	NGS	43 JNT	
S16T034209				Dodecane, 4,6-dimethyl-	61141728	25.95	NGS	8.8 JNT	
S16T034209				Tridecane	632605	26.49	NGS	5.8 JNT	

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**Cartridge Evaluation  
 Data Summary Report**

**Sample Group: 20162990**  
**SDG Number:**  
**Customer Sample ID: 16-08636-2-IN-A**  
**Customer Sample ID: 16-08636-2-IN-A**

Sample#	R	Alt	OC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034210				Unknown-1	-	7.90	NGS	51	JT
S16T034210				Allyl(methoxydimethyl)silane	30535-30-9	8.32	NGS	38	JNT
S16T034210				Tetrahydrofuran	109-99-9	11.60	NGS	74	JNT
S16T034210				Cyclotetrasiloxane, octamethyl	556-87-2	19.86	NGS	39	JNT
S16T034210				Undecane	1120214	23.36	NGS	12	JNT
S16T034210				Unknown-2	-	23.78	NGS	76	JT
S16T034210				Dodecane	112403	24.83	NGS	8.9	JNT
S16T034210				Methanamine	100-97-0	25.74	NGS	100	JNT
S16T034210				Benzo[b]thiazole	95-18-9	25.85	NGS	36	JNT
S16T034210				Dodecane, 2,5,11-trimethyl-	31295564	25.94	NGS	9.9	JNT
S16T034210				Dodecane, 4,6-dimethyl-	8114126	26.49	NGS	5.6	JNT

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Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162990

SDG Number:

Customer Sample ID: 16-08636-2-IN-H

Customer Sample ID: 16-08636-2-IN-H

Sample#	R	Alt	GC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T034211				Unknown-1	-	7.84	NGS	76 JT	
S16T034211				Methoxytrimethylsilane	1825-61-2	8.34	NGS	36 JNT	
S16T034211				Tetrahydrofuran	109-99-9	11.60	NGS	63 JNT	
S16T034211				N-Nitrosodimethylamine	62-75-9	15.36	NGS	9.2 JNT	
S16T034211				Unknown-2	-	23.78	NGS	40 JT	
S16T034211				Dodecane	112-40-3	24.83	NGS	8.7 JNT	
S16T034211				Unknown-3	-	25.60	NGS	36 JT	
S16T034211				Methanamine	100-97-0	25.73	NGS	300 JNT	
S16T034211				Dodecane, 2,6,10-trimethyl-	8891893	26.95	NGS	9.7 JNT	

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T - Tentatively Identified Compound  
 N - Named TIC

*Jane Juye*  
 11/17/16

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BASE-EFF  
 Customer Sample ID: 16-08636-2-BASE-EFF

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T004212			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T004212			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T004212			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T004212			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T004212			107-05-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T004212			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T004212			108-45-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T004212			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T004212			71-39-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T004212			111-70-6	1-Heptanol	NGS	90	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T004212			71-23-8	1-Propanol	NGS	120	<8.9	20	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T004212			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T004212			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T004212			79-93-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T004212			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T004212			891-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T004212			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T004212			78-94-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T004212			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T004212			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T004212			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T004212			108-10-1	4-Methyl-2-Pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T004212			67-64-1	Acetone	NGS	91	4.4	9.2	n/a	n/a	n/a	n/a	2.8	n/a	BJ
S16T004212			75-05-8	Acetonitrile	NGS	96	<1.6	240	n/a	n/a	n/a	n/a	1.6	n/a	
S16T004212			98-86-2	Acetophenone	NGS	92	<8.2	<8.2	n/a	n/a	n/a	n/a	8.2	n/a	U
S16T004212			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T004212			107-19-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T004212			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BASE-EFF  
 Customer Sample ID: 16-08636-2-BASE-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RFP %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA 82															
S16T034212			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034212			100-47-0	Benzonitrile	NGS	95	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034212			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034212			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034212			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034212			103-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034212			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034212			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034212			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034212			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034212			64-17-5	Ethanol	NGS	120	6.6	120	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034212			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034212			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034212			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034212			119-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034212			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034212			128-68-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034212			73-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034212			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034212			99-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034212			110-59-8	Pentamethylene	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034212			107-12-0	Propenenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034212			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034212			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034212			127-18-4	Tetrachloroethane	NGS	99	<1.8	35	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034212			108-66-3	Toluene	NGS	98	<2.2	3.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034212			79-01-6	Trichloroethene	NGS	96	<1.5	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034212			75-69-4	Trichlorofluoromethane	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BASE-EFF  
 Customer Sample ID: 16-08636-2-BASE-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034212			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/b	n/b	n/b	n/b	1.8	n/b	U
S16T034212			123-66-4	n-Butyl acetate	NGS	63	<2.4	<2.4	n/b	n/b	n/b	n/b	2.4	n/b	U
S16T034212			142-62-5	n-Heptane	NGS	100	<1.6	<1.6	n/b	n/b	n/b	n/b	1.6	n/b	U
S16T034212			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/b	n/b	n/b	n/b	2.1	n/b	U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162391  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BASE-IN  
 Customer Sample ID: 16-08636-2-BASE-IN

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034213			79-34-5	1,1,2,2-Tetrachloroethane	NGS	98	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		r/n/U
S16T034213			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		r/n/U
S16T034213			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		r/n/U
S16T034213			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		r/n/U
S16T034213			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		r/n/U
S16T034213			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8		r/n/U
S16T034213			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		r/n/U
S16T034213			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		r/n/U
S16T034213			71-36-3	1-Bromoalcohol	NGS	120	<4.3	170	n/a	n/a	n/a	n/a	4.3		r/n/U
S16T034213			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1		r/n/U
S16T034213			71-23-8	1-Propenal	NGS	120	<8.9	17	n/a	n/a	n/a	n/a	8.9		r/n/U
S16T034213			109-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		r/n/U
S16T034213			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		r/n/U
S16T034213			78-93-3	2-Butanone	NGS	93	<3.1	3.6	n/a	n/a	n/a	n/a	3.1		r/n/U
S16T034213			110-43-0	2-Heptanone	NGS	94	<2.6	4.4	n/a	n/a	n/a	n/a	2.6		r/n/U
S16T034213			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		r/n/U
S16T034213			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		r/n/U
S16T034213			78-94-4	3-Bromo-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		r/n/U
S16T034213			106-35-4	3-Heptanone	NGS	94	<2.7	4.0	n/a	n/a	n/a	n/a	2.7		r/n/U
S16T034213			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		r/n/U
S16T034213			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		r/n/U
S16T034213			109-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		r/n/U
S16T034213			67-64-1	Acetone	NGS	91	4.4	23	n/a	n/a	n/a	n/a	2.8		r/n/B
S16T034213			75-05-9	Acetonitrile	NGS	98	<1.6	250	n/a	n/a	n/a	n/a	1.6		r/n/B
S16T034213			98-06-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2		r/n/U
S16T034213			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		r/n/U
S16T034213			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		r/n/U
S16T034213			107-06-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		r/n/U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-06636-2-BASE-IN  
 Customer Sample ID: 16-06636-2-BASE-IN

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Reset	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034213			71-43-2	Benzene	NGS	98	<1.5	2.1	n/a	n/a	n/a	n/a	1.5		n/a J
S161034213			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a U
S161034213			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U
S161034213			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S161034213			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S161034213			106-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a U
S161034213			75-00-3	Chloroethane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S161034213			87-68-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S161034213			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S161034213			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S161034213			84-17-5	Ethanol	NGS	120	5.6	83	n/a	n/a	n/a	n/a	3.7		n/a B
S161034213			141-78-8	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S161034213			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S161034213			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S161034213			110-54-3	Hexane	NGS	100	1.5	2.6	n/a	n/a	n/a	n/a	1.3		n/a B J
S161034213			828-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S161034213			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S161034213			75-09-2	Methylene Chloride	NGS	100	4.2	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S161034213			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a U
S161034213			88-83-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a U
S161034213			110-59-8	Pentamethyl	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S161034213			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S161034213			110-96-1	Pyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S161034213			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S161034213			127-18-4	Tetrachloroethene	NGS	99	<1.8	21	n/a	n/a	n/a	n/a	1.8		n/a
S161034213			108-88-3	Toluene	NGS	98	<2.2	5.8	n/a	n/a	n/a	n/a	2.2		n/a J
S161034213			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S161034213			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	4.3	n/a	n/a	n/a	n/a	1.9		n/a J

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BASE-IN  
 Customer Sample ID: 16-08636-2-BASE-IN

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034213			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034213			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S16T034213			142-82-5	n-Heptane	NGS	100	<1.6	4.1	n/a	n/a	n/a	n/a	1.6		n/a/J
S16T034213			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a/U

T - Tentatively Identified Compound  
 B - Blank Contamination

J - Estimated  
 U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected  
 N - Named TIC

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-EFF  
 Customer Sample ID: 16-08636-2-BLANK-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034214			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a U
S16T034214			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S16T034214			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034214			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034214			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034214			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	n/a	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T034214			108-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S16T034214			120-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T034214			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	n/a U
S16T034214			111-70-5	1-Hepanol	NGS	90	<0.1	<0.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a U
S16T034214			71-23-8	1-Propanol	NGS	120	<0.9	<0.9	n/a	n/a	n/a	n/a	8.9	n/a	n/a U
S16T034214			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S16T034214			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S16T034214			78-93-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	n/a U
S16T034214			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034214			591-78-5	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a U
S16T034214			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034214			78-94-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034214			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a U
S16T034214			108-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T034214			105-42-0	4-Methyl-2-Hexanone	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T034214			108-10-1	4-Methyl-2-Pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S16T034214			87-84-1	Acetone	NGS	91	4.4	3.7	n/a	n/a	n/a	n/a	2.8	n/a	n/a BU
S16T034214			75-05-9	Acetonitrile	NGS	98	<1.6	32	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034214			98-86-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	n/a U
S16T034214			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a U
S16T034214			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S16T034214			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-EFF  
 Customer Sample ID: 16-08636-2-BLANK-EFF

Sampled	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
VAPOR-TDU VOA II															
S161034214			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
S161034214			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a,U
S161034214			123-72-8	Bis(2-nitrophenyl) ether	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a,U
S161034214			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a,U
S161034214			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
S161034214			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U
S161034214			75-00-3	Chloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			97-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
S161034214			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
S161034214			94-17-5	Ethanol	NGS	120	6.6	35	n/a	n/a	n/a	n/a	3.7		n/a,B
S161034214			141-78-8	Ethyl acetate	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
S161034214			110-00-8	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
S161034214			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3		n/a,U
S161034214			528-73-8	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
S161034214			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1		n/a,U
S161034214			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a,U
S161034214			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a,U
S161034214			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
S161034214			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			110-96-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
S161034214			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a,U
S161034214			127-18-4	Tetrachloroethene	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S161034214			108-88-3	Toluene	NGS	98	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a,U
S161034214			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
S161034214			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a,U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162091  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-EFF  
 Customer Sample ID: 16-08636-2-BLANK-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034214			10061-01-5	dis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034214			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034214			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034214			10061-02-5	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U

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E - Outside Calibration Range

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T - Tentatively Identified Compound  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-IN  
 Customer Sample ID: 16-08636-2-BLANK-IN

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034215			79-34-5	1,1,2,2-Tetrachloroethane	NGS	96	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U
S16T034215			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034215			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034215			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034215			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034215			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034215			108-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034215			120-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034215			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3		n/a U
S16T034215			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1		n/a U
S16T034215			71-23-8	1-Propanol	NGS	120	<8.9	33	n/a	n/a	n/a	n/a	8.9		n/a
S16T034215			108-47-4	2,4-Dimethylpyridine	NGS	96	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034215			1708-29-6	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a U
S16T034215			78-09-3	2-Butanone	NGS	93	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1		n/a U
S16T034215			110-43-0	2-Heptanone	NGS	94	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034215			591-78-6	2-Hexanone	NGS	96	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a U
S16T034215			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034215			78-04-4	3-Buten-2-one	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T034215			106-35-4	3-Heptanone	NGS	94	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T034215			105-88-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034215			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034215			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a U
S16T034215			67-64-1	Acetone	NGS	91	4.4	5.9	n/a	n/a	n/a	n/a	2.8		n/a BU
S16T034215			75-05-8	Acetonitrile	NGS	98	<1.6	99	n/a	n/a	n/a	n/a	1.6		n/a U
S16T034215			88-68-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2		n/a U
S16T034215			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034215			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034215			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162091  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-IN  
 Customer Sample ID: 16-08636-2-BLANK-IN

Sample#	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	\$pk Rec %	Det Limit	Col Err %	Qual Flags
YAPQR-TDU VOA #2															
S16T034215			71-43-2	Benzene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a/U
S16T034215			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a/U
S16T034215			123-72-8	Butanal	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a/U
S16T034215			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a/U
S16T034215			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a/U
S16T034215			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a/U
S16T034215			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S16T034215			57-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034215			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a/U
S16T034215			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
S16T034215			64-17-5	Ethanol	NGS	120	6.6	6.9	n/a	n/a	n/a	n/a	3.7		n/a/B
S16T034215			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034215			100-1-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S16T034215			110-00-9	Furan	NGS	90	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S16T034215			110-54-3	Hexane	NGS	100	1.5	<1.3	n/a	n/a	n/a	n/a	1.3		n/a/U
S16T034215			528-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a/U
S16T034215			126-88-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034215			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1		n/a/U
S16T034215			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a/U
S16T034215			98-85-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a/U
S16T034215			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a/U
S16T034215			107-12-0	Propanenitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034215			110-96-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a/U
S16T034215			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a/U
S16T034215			127-18-4	Tetrachloroethene	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a/U
S16T034215			106-98-3	Toluene	NGS	98	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a/U
S16T034215			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a/U
S16T034215			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a/U

T - Tentatively Identified Compound  
 B - Blank Contaminant  
 E - Outside Calibration Range  
 J - Estimated  
 U - Less Than Detection Limit  
 NA = Not Analyzed, ND = Not Detected  
 N - Named TIC

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-BLANK-IN  
 Customer Sample ID: 16-08636-2-BLANK-IN

Sample#	R	AI	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA 12															
S16T034215			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034215			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034215			142-92-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034215			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

NA = Not Analyzed, ND = Not Detected  
 N = Named TIC

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 B - Blank Contamination



Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-06636-2-IN-B  
 Customer Sample ID: 16-06636-2-IN-B

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034216			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U
S16T034216			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034216			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034216			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034216			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034216			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034216			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034216			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034216			71-36-3	1-Butanol	NGS	120	<4.3	1.6E+03	n/a	n/a	n/a	n/a	4.3		n/a E
S16T034216			111-70-6	1-Heptanol	NGS	90	<8.1	<8.1	n/a	n/a	n/a	n/a	8.1		n/a U
S16T034216			71-23-8	1-Propanol	NGS	120	<8.9	150	n/a	n/a	n/a	n/a	8.9		n/a U
S16T034216			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034216			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a U
S16T034216			78-93-3	2-Butanone	NGS	93	<3.1	8.4	n/a	n/a	n/a	n/a	3.1		n/a J
S16T034216			110-43-0	2-Heptanone	NGS	94	<2.6	7.8	n/a	n/a	n/a	n/a	2.6		n/a J
S16T034216			591-78-6	2-Hexanone	NGS	96	<2.5	4.0	n/a	n/a	n/a	n/a	2.5		n/a J
S16T034216			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034216			78-94-4	3-Buten-2-one	NGS	91	<1.9	6.7	n/a	n/a	n/a	n/a	1.9		n/a J
S16T034216			106-35-4	3-Heptanone	NGS	94	<2.7	6.1	n/a	n/a	n/a	n/a	2.7		n/a J
S16T034216			106-88-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034216			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T034216			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	2.2	n/a	n/a	n/a	n/a	2.2		n/a J
S16T034216			67-64-1	Acetone	NGS	91	4.4	350	n/a	n/a	n/a	n/a	2.8		n/a B
S16T034216			75-05-8	Acetonitrile	NGS	98	<1.6	190	n/a	n/a	n/a	n/a	1.6		n/a B
S16T034216			88-86-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2		n/a U
S16T034216			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034216			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034216			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a U

T - Tentatively Identified Compound  
 B - Blank Contamination  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 M - Named TIC  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-06636-2-IN-B  
 Customer Sample ID: 16-06636-2-IN-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034216			71-43-2	Benzene	NGS	98	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T034216			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	n/a
S16T034216			123-72-8	Benzal	NGS	100	<3.0	15	n/a	n/a	n/a	n/a	3.0	n/a	n/a
S16T034216			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T034216			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T034216			106-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a
S16T034216			75-09-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034216			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034216			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S16T034216			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S16T034216			64-17-5	Ethanol	NGS	120	8.6	220	n/a	n/a	n/a	n/a	3.7	n/a	n/a
S16T034216			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034216			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S16T034216			110-00-9	Furan	NGS	90	<1.6	17	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034216			110-54-3	Hexane	NGS	100	1.5	9.4	n/a	n/a	n/a	n/a	1.3	n/a	n/a
S16T034216			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034216			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034216			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a
S16T034216			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	n/a
S16T034216			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	n/a
S16T034216			110-59-8	Pentacarbonitrile	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T034216			107-12-0	Propanenitrile	NGS	100	<1.8	3.1	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034216			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T034216			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
S16T034216			127-18-4	Tetrachloroethene	NGS	98	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T034216			109-89-3	Toluene	NGS	98	<2.2	5.0	n/a	n/a	n/a	n/a	2.2	n/a	n/a
S16T034216			79-01-6	Trichloroethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034216			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	12	n/a	n/a	n/a	n/a	1.9	n/a	n/a

T - Tentatively Identified Compound  
 B - Blank Contamination  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 NA = Not Analyzed, ND = Not Detected  
 N - Named TIC

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991

SDG Number:

Customer Sample ID: 16-08636-2-IN-B

Customer Sample ID: 16-08636-2-IN-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034216			10061-01-5	dis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/b	n/b	n/b	n/b	1.8	n/b	U
S16T034216			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/b	n/b	n/b	n/b	2.4	n/b	U
S16T034216			142-82-5	n-Heptane	NGS	100	<1.6	12	n/b	n/b	n/b	n/b	1.6	n/b	J
S16T034216			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/b	n/b	n/b	n/b	2.1	n/b	U

NA = Not Analyzed, ND = Not Detected  
 N = Named TIC

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-C  
 Customer Sample ID: 16-08636-2-IN-C

Sample #	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Est Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034217			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034217			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034217			79-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034217			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034217			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034217			542-75-6	1,3-Dichloropropane (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034217			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034217			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034217			71-38-3	1-Butanol	NGS	120	<4.3	1.6E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T034217			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034217			71-23-8	1-Propanol	NGS	120	<8.9	97	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034217			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034217			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034217			78-03-3	2-Butanone	NGS	93	<3.1	8.2	n/a	n/a	n/a	n/a	3.1	n/a	J
S16T034217			110-43-0	2-Heptanone	NGS	94	<2.6	8.8	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034217			591-78-6	2-Hexanone	NGS	96	<2.5	4.2	n/a	n/a	n/a	n/a	2.5	n/a	J
S16T034217			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T034217			78-94-4	3-Buten-2-one	NGS	91	<1.9	8.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034217			105-35-4	3-Heptanone	NGS	94	<2.7	8.9	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T034217			105-88-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034217			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034217			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	2.4	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T034217			87-84-1	Acetone	NGS	91	4.4	340	n/a	n/a	n/a	n/a	2.8	n/a	B
S16T034217			75-05-8	Acetonitrile	NGS	98	<1.0	94	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034217			89-85-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034217			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034217			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034217			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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 N = Named TIC

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162391

SDG Number:

Customer Sample ID: 16-08636-2-IN-C

Customer Sample ID: 16-08636-2-IN-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034217			71-43-2	Benzene	NGS	96	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034217			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034217			123-72-8	Butanal	NGS	100	<3.0	19	n/a	n/a	n/a	n/a	3.0	n/a	
S16T034217			106-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034217			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034217			106-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034217			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034217			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034217			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034217			124-18-5	Decane	NGS	99	<3.3	5.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T034217			64-17-5	Ethanol	NGS	120	6.6	190	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034217			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034217			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034217			110-00-9	Furan	NGS	90	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034217			110-54-3	Hexane	NGS	100	1.5	11	n/a	n/a	n/a	n/a	1.3	n/a	BU
S16T034217			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034217			126-99-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034217			75-06-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034217			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034217			98-55-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034217			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034217			107-12-0	Propanenitrile	NGS	100	<1.6	3.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T034217			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034217			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034217			127-18-4	Tetrachloroethene	NGS	99	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	
S16T034217			104-88-3	Toluene	NGS	98	<2.2	5.2	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T034217			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034217			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	12	n/a	n/a	n/a	n/a	1.9	n/a	J

T - Tentatively Identified Compound  
 B - Blank Contaminant/Son  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-C  
 Customer Sample ID: 16-08636-2-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034217			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034217			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T034217			142-82-5	n-Heptane	NGS	100	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034217			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	J

T - Tentatively Identified Compound  
 B - Blank Contamination

J - Estimated  
 U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected  
 N - Named TIC

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-D  
 Customer Sample ID: 16-08636-2-IN-D

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Res:St	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA BZ															
S16T034218		79-34-5		1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U
S16T034218		79-03-5		1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034218		75-34-3		1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034218		75-35-4		1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034218		107-06-2		1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T034218		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034218		106-46-7		1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034218		123-91-1		1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T034218		71-35-3		1-Bz.Laol	NGS	120	<4.3	1.5E+03	n/a	n/a	n/a	n/a	4.3		n/a E
S16T034218		111-70-6		1-Heptanol	NGS	90	<8.1	<8.1	n/a	n/a	n/a	n/a	8.1		n/a U
S16T034218		71-23-8		1-Propanol	NGS	90	<8.9	98	n/a	n/a	n/a	n/a	8.9		n/a U
S16T034218		108-47-4		2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1		n/a U
S16T034218		1708-29-8		2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2		n/a U
S16T034218		78-93-3		2-Butanone	NGS	93	<3.1	7.6	n/a	n/a	n/a	n/a	3.1		n/a J
S16T034218		110-43-0		2-Heptanone	NGS	94	<2.6	4.8	n/a	n/a	n/a	n/a	2.6		n/a J
S16T034218		691-78-6		2-Hexanone	NGS	96	<2.5	3.4	n/a	n/a	n/a	n/a	2.5		n/a J
S16T034218		534-22-5		2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T034218		78-54-4		3-Buten-2-one	NGS	91	<1.9	5.8	n/a	n/a	n/a	n/a	1.9		n/a J
S16T034218		105-35-4		3-Heptanone	NGS	94	<2.7	5.0	n/a	n/a	n/a	n/a	2.7		n/a J
S16T034218		105-68-3		3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T034218		105-42-0		4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T034218		108-10-1		4-Methyl-2-Pentanone	NGS	100	<2.2	4.7	n/a	n/a	n/a	n/a	2.2		n/a J
S16T034218		67-64-1		Acetone	NGS	91	4.4	270	n/a	n/a	n/a	n/a	2.8		n/a B
S16T034218		75-05-8		Acetonitrile	NGS	98	<1.6	120	n/a	n/a	n/a	n/a	1.6		n/a B
S16T034218		98-96-2		Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2		n/a U
S16T034218		107-13-1		Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T034218		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3		n/a U
S16T034218		107-05-1		Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a U

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 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-D  
 Customer Sample ID: 16-08636-2-IN-D

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Res:3	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034218			71-43-2	Benzene	NGS	98	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034218			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034218			123-72-8	Butanal	NGS	100	<3.0	14	n/a	n/a	n/a	n/a	3.0	n/a	
S16T034218			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034218			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034218			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034218			75-00-3	Chloroethane	NGS	110	<1.9	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034218			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034218			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034218			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034218			84-17-5	Ethanol	NGS	120	6.6	170	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034218			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034218			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034218			110-00-9	Furan	NGS	90	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034218			110-54-3	Hexane	NGS	100	1.5	9.8	n/a	n/a	n/a	n/a	1.3	n/a	BJ
S16T034218			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034218			126-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034218			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034218			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034218			98-05-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034218			110-59-8	Pentanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034218			107-12-0	Propanenitrile	NGS	100	<1.8	2.6	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034218			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034218			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034218			127-18-4	Tetrachloroethene	NGS	99	<1.8	11	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034218			108-88-3	Toluene	NGS	98	<2.2	4.5	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T034218			79-01-6	Trichloroethene	NGS	98	<1.8	<1.8	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034218			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J

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E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 B - Blank Contamination



**Cartridge Evaluation  
 Data Summary of All Results**

Sample Group: 20162991

SDG Number:

Customer Sample ID: 16-08636-2-IN-D

Customer Sample ID: 16-08636-2-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Dual Flags
VAPOR-TDU VOA #2															
S16T034218			10081-01-5	dis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	r/b	U
S16T034218			123-86-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	r/b	U
S16T034218			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	r/b	U
S16T034218			10081-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	r/b	U

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J = Estimated  
 U = Less Than Detection Limit

T = Tentatively Identified Compound  
 B = Blank Contamination

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991

SDG Number:

Customer Sample ID: 16-08636-2-IN-E

Customer Sample ID: 16-08636-2-IN-E

Sample#	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VQA #2															
S16T034219			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a U
S16T034219			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S16T034219			75-34-3	1,1-Dichloroethane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034219			75-35-4	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034219			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T034219			54-2-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T034219			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S16T034219			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T034219			71-36-3	1-Butanol	NGS	120	<4.3	1.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	n/a E
S16T034219			111-70-6	1-Heptanol	NGS	90	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a U
S16T034219			71-23-6	1-Propanol	NGS	120	<8.9	110	n/a	n/a	n/a	n/a	8.9	n/a	n/a U
S16T034219			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S16T034219			1708-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S16T034219			78-93-3	2-Butanone	NGS	93	<3.1	6.3	n/a	n/a	n/a	n/a	3.1	n/a	n/a J
S16T034219			110-43-0	2-Heptanone	NGS	94	<2.6	5.7	n/a	n/a	n/a	n/a	2.6	n/a	n/a J
S16T034219			591-78-6	2-Hexanone	NGS	95	<2.5	3.3	n/a	n/a	n/a	n/a	2.5	n/a	n/a J
S16T034219			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T034219			28-94-4	3-Buten-2-one	NGS	91	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T034219			106-35-4	3-Heptanone	NGS	94	<2.7	5.8	n/a	n/a	n/a	n/a	2.7	n/a	n/a J
S16T034219			106-69-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T034219			105-42-0	4-Methyl-2-hexanone	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T034219			108-10-1	4-Methyl-2-Pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S16T034219			67-64-1	Acetone	NGS	91	4.4	240	n/a	n/a	n/a	n/a	2.8	n/a	n/a B
S16T034219			75-05-6	Acetonitrile	NGS	98	<1.6	33	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T034219			98-86-2	Acetophenone	NGS	92	<8.2	<8.2	n/a	n/a	n/a	n/a	6.2	n/a	n/a U
S16T034219			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a U
S16T034219			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S16T034219			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a U

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 E - Outside Calibration Range  
 N - Named TIC  
 NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-E  
 Customer Sample ID: 16-08636-2-IN-E

Sampled	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Er %	Qual Flags
VAPOR-TDU VOA II2															
S16T094219			71-43-2	Benzene	NGS	98	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T094219			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T094219			123-72-8	Benzal	NGS	100	<3.0	14	n/a	n/a	n/a	n/a	3.0	n/a	
S16T094219			109-74-0	Benzonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T094219			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T094219			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T094219			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T094219			67-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T094219			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T094219			124-18-5	Decane	NGS	99	<3.3	3.5	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T094219			64-17-5	Ethanol	NGS	120	6.6	180	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T094219			141-78-6	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T094219			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T094219			110-00-9	Furan	NGS	90	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T094219			110-54-3	Hexane	NGS	100	1.5	10	n/a	n/a	n/a	n/a	1.3	n/a	BJ
S16T094219			628-73-9	Heptanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T094219			126-88-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T094219			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T094219			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T094219			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T094219			110-59-8	Pentanitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T094219			107-12-0	Propanenitrile	NGS	100	<1.8	2.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T094219			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T094219			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T094219			127-18-4	Tetrachloroethene	NGS	99	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T094219			108-88-3	Toluene	NGS	98	<2.2	4.4	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T094219			79-01-6	Trichloroethene	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T094219			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-E  
 Customer Sample ID: 16-08636-2-IN-E

Sampled	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Em %	Qual Flags
VAPOR-TDU VOA #2															
S16T034219			10661-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T034219			123-96-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T034219			142-82-5	n-Heptane	NGS	100	<1.6	12	n/a	n/a	n/a	n/a	1.6		n/a J
S16T034219			10661-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-F  
 Customer Sample ID: 16-08636-2-IN-F

Sample#	R	AP	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034220			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T034220			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034220			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034220			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034220			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T034220			542-75-8	1,3-Dichloropropene (Total)	NGS	n/a	n/a	2.0	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034220			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034220			123-91-1	1,4-Dioxane	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T034220			71-36-3	1-Butanol	NGS	120	<4.3	1.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T034220			111-70-6	1-Heptanol	NGS	90	<3.1	<3.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T034220			71-23-6	1-Propanol	NGS	120	<3.1	98	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T034220			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034220			1705-29-8	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034220			78-83-3	2-Butanone	NGS	93	<3.1	8.9	n/a	n/a	n/a	n/a	3.1	n/a	J
S16T034220			110-43-0	2-Heptanone	NGS	94	<2.6	4.6	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T034220			591-78-6	2-Heptanone	NGS	96	<2.5	2.9	n/a	n/a	n/a	n/a	2.5	n/a	J
S16T034220			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T034220			78-94-4	3-Buten-2-one	NGS	91	<1.9	5.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T034220			106-35-4	3-Heptanone	NGS	94	<2.7	4.0	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T034220			106-58-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034220			106-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034220			108-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T034220			97-64-1	Acetone	NGS	91	4.4	360	n/a	n/a	n/a	n/a	2.8	n/a	B
S16T034220			75-05-8	Acetonitrile	NGS	98	<1.6	36	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034220			98-85-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T034220			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T034220			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T034220			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-F  
 Customer Sample ID: 16-08636-2-IN-F

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RFD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA R2															
S16T034220			71-43-2	Benzene	NGS	98	<1.5	2.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T034220			100-47-0	Benzonitrile	NGS	98	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T034220			123-72-8	Butanal	NGS	100	<3.0	10	n/a	n/a	n/a	n/a	3.0	n/a	
S16T034220			109-74-0	Butanenitrile	NGS	100	<2.1	2.2	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T034220			58-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T034220			108-90-7	Chlorobenzene	NGS	99	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T034220			75-00-3	Chloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034220			87-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034220			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T034220			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T034220			84-17-5	Ethanol	NGS	120	6.6	190	n/a	n/a	n/a	n/a	3.7	n/a	B
S16T034220			141-78-6	Ethyl acetate	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034220			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T034220			110-00-9	Furan	NGS	90	<1.6	19	n/a	n/a	n/a	n/a	1.6	n/a	
S16T034220			110-54-3	Hexane	NGS	100	1.5	11	n/a	n/a	n/a	n/a	1.3	n/a	BJ
S16T034220			828-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T034220			126-89-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T034220			75-09-2	Methylene Chloride	NGS	110	4.2	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T034220			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T034220			98-95-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T034220			110-59-8	Pentanenitrile	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034220			107-12-0	Propenenitrile	NGS	100	<1.8	2.9	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034220			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T034220			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T034220			127-18-4	Tetrachloroethene	NGS	99	<1.8	7.2	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T034220			108-88-3	Toluene	NGS	98	<2.2	4.2	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T034220			79-01-6	Trichloroethane	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T034220			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-F  
 Customer Sample ID: 16-08636-2-IN-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S1617094220			10061-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	2.0	n/a	n/a	n/a	n/a	1.8	n/a	J
S1617094220			123-96-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S1617094220			142-92-5	n-Heptane	NGS	100	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	J
S1617094220			10061-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-G  
 Customer Sample ID: 16-08636-2-IN-G

Sampled	R	AM	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Em %	Qual Flags
VAPOR-TDU VOA #2															
S161034221			79-34-5	1,1,2,2-Tetrachloroethane	NGS	99	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a U
S161034221			79-00-5	1,1,2-Trichloroethane	NGS	100	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S161034221			75-34-3	1,1-Dichloroethane	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S161034221			75-35-4	1,1-Dichloroethene	NGS	99	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S161034221			107-06-2	1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S161034221			542-75-8	1,3-Dichloropropene (Total)	NGS	n/a	n/a	8.3	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S161034221			106-46-7	1,4-Dichlorobenzene	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S161034221			123-91-1	1,4-Dioxane	NGS	96	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S161034221			71-36-3	1-Butanol	NGS	120	<4.3	1.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	n/a E
S161034221			111-70-6	1-Heptanol	NGS	90	<3.1	<3.1	n/a	n/a	n/a	n/a	9.1	n/a	n/a U
S161034221			71-23-8	1-Propanol	NGS	120	<8.9	110	n/a	n/a	n/a	n/a	8.9	n/a	n/a U
S161034221			108-47-4	2,4-Dimethylpyridine	NGS	99	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	n/a U
S161034221			1709-29-6	2,5-Dihydrofuran	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S161034221			78-93-3	2-Butanone	NGS	93	<3.1	6.2	n/a	n/a	n/a	n/a	3.1	n/a	n/a J
S161034221			110-43-0	2-Heptanone	NGS	94	<2.6	4.5	n/a	n/a	n/a	n/a	2.6	n/a	n/a J
S161034221			501-78-6	2-Hexanone	NGS	96	<2.5	2.7	n/a	n/a	n/a	n/a	2.5	n/a	n/a J
S161034221			534-22-5	2-Methylfuran	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S161034221			78-94-4	3-Butan-2-one	NGS	91	<1.9	5.1	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S161034221			106-35-4	3-Heptanone	NGS	94	<2.7	3.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a J
S161034221			106-68-3	3-Octanone	NGS	92	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S161034221			105-42-0	4-Methyl-2-hexanone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S161034221			109-10-1	4-Methyl-2-pentanone	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	n/a U
S161034221			67-64-1	Acetone	NGS	91	4.4	180	n/a	n/a	n/a	n/a	2.8	n/a	n/a B
S161034221			75-05-8	Acetonitrile	NGS	98	<1.6	30	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S161034221			58-66-2	Acetophenone	NGS	92	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	n/a U
S161034221			107-13-1	Acrylonitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a U
S161034221			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	n/a U
S161034221			107-05-1	Allyl Chloride	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	n/a U

T - Tentatively Identified Compound  
 B - Blank Contamination  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 N - Narred TIC  
 NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-06636-2-IN-G  
 Customer Sample ID: 16-06636-2-IN-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T034221			71-43-2	Benzene	NGS	98	<1.5	2.8	n/a	n/a	n/a	n/a	1.5		n/a,U
S16T034221			100-47-0	Benzonitrile	NGS	96	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2		n/a,U
S16T034221			123-72-8	Butanal	NGS	100	<3.0	14	n/a	n/a	n/a	n/a	3.0		n/a
S16T034221			109-74-0	Butanenitrile	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a,U
S16T034221			56-23-5	Carbon tetrachloride	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a,U
S16T034221			108-90-7	Chlorobenzene	NGS	98	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5		n/a,U
S16T034221			75-00-3	Chloroethane	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			87-66-3	Chloroform	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			110-82-7	Cyclohexane	NGS	100	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a,U
S16T034221			124-18-5	Decane	NGS	99	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a,U
S16T034221			64-17-5	Ethanol	NGS	120	6.6	200	n/a	n/a	n/a	n/a	3.7		n/a,B
S16T034221			141-78-8	Ethyl acetate	NGS	85	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			100-41-4	Ethylbenzene	NGS	99	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a,U
S16T034221			110-00-9	Furan	NGS	90	<1.6	8.9	n/a	n/a	n/a	n/a	1.6		n/a,U
S16T034221			110-54-3	Hexane	NGS	100	<1.5	9.8	n/a	n/a	n/a	n/a	1.3		n/a,B,U
S16T034221			628-73-9	Hexanenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
S16T034221			128-98-7	Methacrylonitrile	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			75-09-2	Methylene Chloride	NGS	110	4.2	13	n/a	n/a	n/a	n/a	4.1		n/a,B
S16T034221			91-20-3	Naphthalene	NGS	95	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3		n/a,U
S16T034221			98-83-3	Nitrobenzene	NGS	94	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7		n/a,U
S16T034221			110-50-8	o-Toluenitrile	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a,U
S16T034221			107-12-0	Propenenitrile	NGS	100	<1.8	2.4	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a,U
S16T034221			100-42-5	Styrene	NGS	97	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a,U
S16T034221			127-18-4	Tetrachloroethene	NGS	99	<1.8	5.1	n/a	n/a	n/a	n/a	1.8		n/a,U
S16T034221			108-88-3	Toluene	NGS	96	<2.2	5.2	n/a	n/a	n/a	n/a	2.2		n/a,U
S16T034221			79-01-6	Trichloroethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a,U
S16T034221			75-69-4	Trichlorofluoromethane	NGS	89	<1.9	9.8	n/a	n/a	n/a	n/a	1.9		n/a,U

T - Tentatively Identified Compound  
 B - Blank Contamination  
 J - Estimated  
 U - Less Than Detection Limit  
 E - Outside Calibration Range  
 NA = Not Analyzed, ND = Not Detected  
 N - Named TIC

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162991  
 SDG Number:  
 Customer Sample ID: 16-08636-2-IN-G  
 Customer Sample ID: 16-08636-2-IN-G

Sampled	R	AI	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S161034221			10661-01-5	cis-1,3-Dichloropropene	NGS	97	<1.8	5.4	n/a	n/a	n/a	n/a	1.8	n/a	J
S161034221			123-96-4	n-Butyl acetate	NGS	83	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S161034221			142-92-5	n-Heptane	NGS	100	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J
S161034221			10661-02-6	trans-1,3-Dichloropropene	NGS	94	<2.1	2.9	n/a	n/a	n/a	n/a	2.1	n/a	J

NA = Not Analyzed, ND = Not Detected  
 N = Named TIC

E - Outside Calibration Range

J - Estimated  
 U - Less Than Detection Limit

T - Tentatively Identified Compound  
 B - Blank Contamination

Cartridge Evaluation  
 Data Summary of All Results

*Q. M. P. King*  
 10/28/16

Sample Group: 20162986

SDG Number:

Customer Sample ID: 16-08635-3-BASE-EFF  
 Customer Sample ID: 16-08635-3-BASE-EFF

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034142			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034142			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034142			625-85-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034142			3777-71-7	2-Hexylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034142			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034142			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034142			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034142			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034142			109-99-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-BASE-IN  
 Customer Sample ID: 16-08635-3-BASE-IN

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Crit Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034143			1191-59-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034143			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034143			525-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034143			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034143			534-22-5	2-Methylfuran	NGS	75	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T034143			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034143			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034143			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034143			109-99-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-BLANK1  
 Customer Sample ID: 16-08635-3-BLANK1

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD%	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034144			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034144			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034144			625-96-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034144			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034144			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034144			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034144			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034144			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034144			109-99-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-BLANK2  
 Customer Sample ID: 16-08635-3-BLANK2

Sample#	R	AB	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034145			1191-66-7	2,3-Dihydrofuran	NGS	66	<-0.23	<-0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034145			1708-29-8	2,5-Dihydrofuran	NGS	72	<-0.33	<-0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034145			625-95-5	2,5-Dimethylfuran	NGS	81	<-0.75	<-0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034145			3777-71-7	2-Heptylfuran	NGS	92	<-0.86	<-0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034145			534-22-5	2-Methylfuran	NGS	75	<-0.46	<-0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034145			3777-69-3	2-Pentylfuran	NGS	88	<-0.90	<-0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034145			4229-91-8	2-Propylfuran	NGS	86	<-0.62	<-0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034145			110-00-9	Furan	NGS	69	<-0.37	<-0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034145			106-99-9	Tetrahydrofuran	NGS	89	<-0.23	<-0.23	n/a	n/a	n/a	n/a	0.23		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986

SDG Number:

Customer Sample ID: 16-08635-3-EFF-A

Customer Sample ID: 16-08635-3-EFF-A

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034146			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034146			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034146			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034146			3777-71-7	2-Hexylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034146			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034146			3777-69-3	2-Pentylfuran	NGS	86	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034146			4228-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034146			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034146			109-89-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

**Cartridge Evaluation  
 Data Summary of All Results**

**Sample Group: 20162986**  
**SDG Number:**  
**Customer Sample ID: 16-08635-3-EFF-B**  
**Customer Sample ID: 16-08635-3-EFF-B**

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034147			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034147			1708-28-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034147			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034147			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034147			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034147			3777-68-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034147			4229-51-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034147			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034147			108-96-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated



**Cartridge Evaluation  
 Data Summary of All Results**

**Sample Group: 20162986**  
**SDG Number:**  
**Customer Sample ID: 16-08635-3-EFF-C**  
**Customer Sample ID: 16-08635-3-EFF-C**

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034148			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034148			1706-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034148			623-66-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034148			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034148			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034148			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034148			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034148			110-00-9	Furan	NGS	66	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034148			109-99-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986

SDG Number:

Customer Sample ID: 16-08635-3-EFF-D

Customer Sample ID: 16-08635-3-EFF-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034149			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034149			1708-28-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034149			625-86-3	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034149			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034149			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034149			3777-68-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034149			4229-51-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034149			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034149			109-99-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162366

SDG Number:

Customer Sample ID: 16-08635-3-EFF-E

Customer Sample ID: 16-08635-3-EFF-E

Sample#	R	All	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034150			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034150			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034150			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034150			3777-71-7	2-Heptylfuran	NGS	82	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034150			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034150			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034150			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034150			110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034150			109-89-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-EFF-F  
 Customer Sample ID: 16-08635-3-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034151			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034151			1708-28-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034151			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034151			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034151			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034151			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034151			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034151			110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034151			109-96-9	Tetrahydrofuran	NGS	89	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-EFF-G  
 Customer Sample ID: 16-08635-3-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Crit Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034152			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034152			1706-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034152			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034152			3777-71-7	2-Hydrofuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034152			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034152			3777-69-3	2-Pentylfuran	NGS	86	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034152			4229-91-8	2-Propylfuran	NGS	86	<0.82	<0.82	n/a	n/a	n/a	n/a	0.82		n/a U
S16T034152			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034152			109-89-9	Tetrahydrofuran	NGS	89	<0.23	0.74	n/a	n/a	n/a	n/a	0.23		n/a J

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986

SDG Number:

Customer Sample ID: 16-08635-3-EFF-H

Customer Sample ID: 16-08635-3-EFF-H

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034153			1181-89-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034153			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034153			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034153			3777-71-7	2-Heptylfuran	NGS	82	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034153			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034153			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034153			4229-81-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034153			110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034153			109-99-9	Tetrahydrofuran	NGS	89	<0.23	1.6	n/a	n/a	n/a	n/a	0.23	n/a	J

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-IN-A  
 Customer Sample ID: 16-08635-3-IN-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034154			1191-89-7	2,3-Dihydrofuran	NGS	66	<0.23	0.29	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T034154			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034154			525-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034154			3777-71-7	2-Hexylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034154			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034154			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034154			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034154			110-60-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034154			109-89-9	Tetrahydrofuran	NGS	89	<0.23	1.30	n/a	n/a	n/a	n/a	0.23	n/a	E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

**Cartridge Evaluation  
 Data Summary of All Results**

**Sample Group: 20162986**  
**SDG Number:**  
**Customer Sample ID: 16-08635-3-IN-B**  
**Customer Sample ID: 16-08635-3-IN-B**

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034155			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034155			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034155			835-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034155			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034155			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034155			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034155			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034155			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034155			109-99-9	Tetrahydrofuran	NGS	89	<0.23	97	n/a	n/a	n/a	n/a	0.23		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986

SDG Number:

Customer Sample ID: 16-08635-3-IN-C

Customer Sample ID: 16-08635-3-IN-C

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034156			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034156			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034156			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034156			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034156			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034156			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034156			4229-51-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034156			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034156			109-96-9	Tetrahydrofuran	NGS	89	<0.23	98	n/a	n/a	n/a	n/a	0.23		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-IN-D  
 Customer Sample ID: 16-08635-3-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034157			1191-69-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034157			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034157			525-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034157			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034157			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034157			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034157			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034157			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034157			109-69-9	Tetrahydrofuran	NGS	89	<0.23	1.10	n/a	n/a	n/a	n/a	0.23	n/a	E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-IN-E  
 Customer Sample ID: 16-08635-3-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034158			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034158			1708-28-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034158			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034158			3777-71-7	2-Heptylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034158			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034158			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034158			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034158			110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034158			109-96-9	Tetrahydrofuran	NGS	89	<0.23	1.10	n/a	n/a	n/a	n/a	0.23		n/a E

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-IN-F  
 Customer Sample ID: 16-08635-3-IN-F

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034159			1191-69-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T034159			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T034159			625-66-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T034159			3777-71-7	2-Heptylfuran	NGS	82	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T034159			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T034159			3777-69-3	2-Pentylfuran	NGS	83	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T034159			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T034159			110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T034159			109-99-9	Tetrahydrofuran	NGS	89	<0.23	120	n/a	n/a	n/a	n/a	0.23		n/a E

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary of All Results

Sample Group: 20162986  
 SDG Number:  
 Customer Sample ID: 16-08635-3-IN-G  
 Customer Sample ID: 16-08635-3-IN-G

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034160			1191-99-7	2,3-Dihydrofuran	NGS	66	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034160			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034160			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034160			3777-71-7	2-Hexylfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034160			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034160			3777-69-3	2-Pentylfuran	NGS	88	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034160			4229-91-8	2-Propylfuran	NGS	86	<0.82	<0.82	n/a	n/a	n/a	n/a	0.82	n/a	U
S16T034160			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034160			109-99-9	Tetrahydrofuran	NGS	88	<0.23	140	n/a	n/a	n/a	n/a	0.23	n/a	E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

**Cartridge Evaluation  
 Data Summary of All Results**

**Sample Group: 20162986**  
**SDG Number:**  
**Customer Sample ID: 16-08635-3-IN-H**  
**Customer Sample ID: 16-08635-3-IN-H**

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dat Limit	Cont Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034161			1191-99-7	2,3-Dihydrofuran	NGS	86	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T034161			1708-29-8	2,5-Dihydrofuran	NGS	72	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T034161			625-86-5	2,5-Dimethylfuran	NGS	81	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T034161			3777-71-7	2-Hydroxyfuran	NGS	92	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T034161			534-22-5	2-Methylfuran	NGS	75	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T034161			3777-69-3	2-Pentylfuran	NGS	86	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T034161			4229-91-8	2-Propylfuran	NGS	86	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T034161			110-00-9	Furan	NGS	69	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T034161			109-99-9	Tetrahydrofuran	NGS	89	<0.23	1.50	n/a	n/a	n/a	n/a	0.23	n/a	E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

*Janet*  
 12/11/16

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-06636-3-BASE-EFF  
 Customer Sample ID: 16-08636-3-BASE-EFF

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicates	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034162			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034162			1708-29-6	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034162			625-66-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034162			3777-71-7	2-Hepylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034162			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034162			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034162			4229-91-6	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034162			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034162			109-89-9	Tetrahydrofuran	NGS	100	<0.31	0.39	n/a	n/a	n/a	n/a	0.31		n/a J

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-BASE-IN  
 Customer Sample ID: 16-08636-3-BASE-IN

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034163			1181-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034163			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034163			625-98-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034163			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034163			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034163			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034163			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034163			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034163			109-99-9	Tetrahydrofuran	NGS	100	<0.31	5.1	n/a	n/a	n/a	n/a	0.31		n/a

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-BLANK-EFF  
 Customer Sample ID: 16-08636-3-BLANK-EFF

Sampled	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat	Err %	Qual Flags
Furans in Vapor Samples by SIM																
S16T034164			1181-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32			n/a/U
S16T034164			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45			n/a/U
S16T034164			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26			n/a/U
S16T034164			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38			n/a/U
S16T034164			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15			n/a/U
S16T034164			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29			n/a/U
S16T034164			4228-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21			n/a/U
S16T034164			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58			n/a/U
S16T034164			108-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31			n/a/U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SOG Number:  
 Customer Sample ID: 16-08636-3-BLANK-IN  
 Customer Sample ID: 16-08636-3-BLANK-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans In Vapor Samples by SIM															
S16T034165			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034165			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034165			825-85-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034165			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034165			334-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034165			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034165			4228-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034165			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034165			109-89-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-A  
 Customer Sample ID: 16-08636-3-EFF-A

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034174			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034174			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034174			828-96-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034174			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034174			594-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034174			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034174			4228-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034174			110-00-8	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034174			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-B  
 Customer Sample ID: 16-08636-3-EFF-B

Sample#	R #	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Det Limit	Cont Err %	Qual Flags
Furans in Vapor Samples by SIM														
S16T034175		1191-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T034175		1708-29-6	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T034175		625-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T034175		3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T034175		534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T034175		3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T034175		4229-91-6	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T034175		110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T034175		109-89-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-C  
 Customer Sample ID: 16-08636-3-EFF-C

Sampled	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPO %	Spk Rec %	Dat Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034176			1181-59-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T034176			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T034176			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T034176			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T034176			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T034176			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T034176			4229-51-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T034176			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T034176			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a/U

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-D  
 Customer Sample ID: 16-08636-3-EFF-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034177			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034177			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034177			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034177			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034177			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034177			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034177			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034177			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034177			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SOG Number:  
 Customer Sample ID: 16-08636-3-EFF-E  
 Customer Sample ID: 16-08636-3-EFF-E

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034178			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034178			1703-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034178			525-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034178			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034178			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034178			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034178			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034178			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034178			109-89-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-F  
 Customer Sample ID: 16-08636-3-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034179			1191-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034179			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034179			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034179			3777-71-7	2-Hepitylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034179			534-23-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034179			3777-89-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034179			4229-91-6	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034179			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034179			109-89-9	Tetrahydrofuran	NGS	100	<0.31	0.67	n/a	n/a	n/a	n/a	0.31		n/a J

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-G  
 Customer Sample ID: 16-08636-3-EFF-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034180			1181-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T034180			1768-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T034180			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T034180			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T034180			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T034180			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T034180			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T034180			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T034180			109-99-9	Tetrahydrofuran	NGS	100	<0.31	2.1	n/a	n/a	n/a	n/a	0.31		n/a/J

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-EFF-H  
 Customer Sample ID: 16-08636-3-EFF-H

Sampled	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034181			1181-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034181			1768-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034181			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034181			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034181			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034181			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034181			4228-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034181			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034181			109-99-9	Tetrahydrofuran	NGS	100	<0.31	8.2	n/a	n/a	n/a	n/a	0.31		n/a

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-A  
 Customer Sample ID: 16-08636-3-IN-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034166			1181-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034166			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034166			825-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034166			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034166			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034166			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034166			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034166			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034166			109-99-9	Tetrahydrofuran	NGS	100	<0.31	87	n/a	n/a	n/a	n/a	0.31		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-06636-3-IN-B  
 Customer Sample ID: 16-08636-3-IN-B

Sample #	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034167			1191-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034167			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034167			525-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034167			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034167			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034167			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034167			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034167			110-60-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034167			109-89-9	Tetrahydrofuran	NGS	100	<0.31	95	n/a	n/a	n/a	n/a	0.31		n/a E

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-C  
 Customer Sample ID: 16-08636-3-IN-C

Sampled	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034168			1181-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034168			1706-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034168			825-96-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034168			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034168			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034168			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034168			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034168			110-00-9	Furan	NGS	110	<0.50	<0.50	n/a	n/a	n/a	n/a	0.50		n/a U
S16T034168			109-99-9	Tetrahydrofuran	NGS	100	<0.31	98	n/a	n/a	n/a	n/a	0.31		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-D  
 Customer Sample ID: 16-08636-3-IN-D

Sample#	R	AF	CAS #	Analysis	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Em %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034169			1181-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034169			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034169			825-96-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034169			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034169			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034169			3777-69-3	2-Phenylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034169			4226-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034169			110-00-9	Furan	NGS	110	<0.59	<0.59	n/a	n/a	n/a	n/a	0.59		n/a U
S16T034169			109-99-9	Tetrahydrofuran	NGS	100	<0.31	100	n/a	n/a	n/a	n/a	0.31		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-E  
 Customer Sample ID: 16-08636-3-IN-E

Sample#	R	As	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cent Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034170			1191-89-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034170			1708-29-6	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034170			625-86-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034170			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034170			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034170			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034170			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034170			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034170			109-99-9	Tetrahydrofuran	NGS	100	<0.31	110	n/a	n/a	n/a	n/a	0.31		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-F  
 Customer Sample ID: 16-08636-3-IN-F

Sample #	R #	AW	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Con Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034171			1181-99-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T034171			1706-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T034171			525-96-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T034171			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T034171			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T034171			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T034171			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T034171			110-00-8	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T034171			109-99-9	Tetrahydrofuran	NGS	100	<0.31	98	n/a	n/a	n/a	n/a	0.31		n/a E

J - Estimated

U - Less Than Detection Limit

E - Outside Calibration Range

NA = Not Analyzed, ND = Not Detected



Cartridge Evaluation  
 Data Summary Report

Sample Group: 20162987  
 SDG Number:  
 Customer Sample ID: 16-08636-3-IN-G  
 Customer Sample ID: 16-08636-3-IN-G

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T034172			1181-69-7	2,3-Dihydrofuran	NGS	130	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a/U
S16T034172			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a/U
S16T034172			325-36-5	2,5-Dimethylfuran	NGS	100	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a/U
S16T034172			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a/U
S16T034172			534-22-5	2-Methylfuran	NGS	100	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a/U
S16T034172			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a/U
S16T034172			4229-91-8	2-Propylfuran	NGS	130	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a/U
S16T034172			110-00-9	Furan	NGS	110	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a/U
S16T034172			109-99-9	Tetrahydrofuran	NGS	100	<0.31	1.10	n/a	n/a	n/a	n/a	0.31		n/a/E

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

J - Estimated



# ANALYTICAL REPORT

Report Date: October 05, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

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20162970

Workorder: **34-1627302**

Client Project ID: Washington River Protection  
So

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033565</b>		Collected: 09/23/2016		
Lab ID: 1627302001		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: <b>S16T033566</b>		Collected: 09/23/2016		
Lab ID: 1627302002		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: <b>S16T033567</b>		Collected: 09/23/2016		
Lab ID: 1627302003		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10

Results Continued on Next Page

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**1627302 - Page 1 of 16**

Wed, 10/05/16 4:11 PM



ANALYTICAL REPORT

Workorder: 34-1627302
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Row 1: Methylamine, <0.10, NA, NA, 0.10. Includes sample ID S16T033567 and method Amine-VOA Aliphatic VAA-1.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows: Dimethylamine, Ethylamine, Methylamine. All results are <0.10. Includes sample ID S16T033568 and method Amine-VOA Aliphatic VAA-1.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows: Dimethylamine, Ethylamine, Methylamine. All results are <0.10. Includes sample ID S16T033569 and method Amine-VOA Aliphatic VAA-1.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows: Dimethylamine, Ethylamine, Methylamine. All results are <0.10. Includes sample ID S16T033570 and method Amine-VOA Aliphatic VAA-1.



### ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: <b>S16T033571</b>		Collected: 09/23/2016		
Lab ID: 1627302007		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: <b>S16T033572</b>		Collected: 09/23/2016		
Lab ID: 1627302008		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: <b>S16T033573</b>		Collected: 09/23/2016		
Lab ID: 1627302009		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: <b>S16T033574</b>		Collected: 09/23/2016		
Lab ID: 1627302010		Received: 09/28/2016		
Method: <b>Amines-VOA Aliphatic VAA-1</b>		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



### ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033575		Collected: 09/23/2016		
Lab ID: 1627302011		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033576		Collected: 09/23/2016		
Lab ID: 1627302012		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033577		Collected: 09/23/2016		
Lab ID: 1627302013		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033578		Collected: 09/23/2016		
Lab ID: 1627302014		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.27	NA	NA	0.10



**ANALYTICAL REPORT**

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033579		Collected: 09/23/2016		
Lab ID: 1627302015		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.40	NA	NA	0.10

Sample ID: S16T033580		Collected: 09/23/2016		
Lab ID: 1627302016		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.64	NA	NA	0.10

Sample ID: S16T033581		Collected: 09/23/2016		
Lab ID: 1627302017		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.57	NA	NA	0.10

Sample ID: S16T033582		Collected: 09/23/2016		
Lab ID: 1627302018		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.57	NA	NA	0.10



### ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033583		Collected: 09/23/2016		
Lab ID: 1627302019		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.49	NA	NA	0.10

Sample ID: S16T033584		Collected: 09/23/2016		
Lab ID: 1627302020		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.49	NA	NA	0.10

Sample ID: S16T033585		Collected: 09/24/2016		
Lab ID: 1627302021		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033586		Collected: 09/24/2016		
Lab ID: 1627302022		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



# ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033587		Collected: 09/24/2016		
Lab ID: 1627302023		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033588		Collected: 09/24/2016		
Lab ID: 1627302024		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033589		Collected: 09/24/2016		
Lab ID: 1627302025		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033590		Collected: 09/24/2016		
Lab ID: 1627302026		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10





### ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033591		Collected: 09/24/2016		
Lab ID: 1627302027		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033592		Collected: 09/24/2016		
Lab ID: 1627302028		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033593		Collected: 09/24/2016		
Lab ID: 1627302029		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033594		Collected: 09/24/2016		
Lab ID: 1627302030		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



### ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033595		Collected: 09/24/2016		
Lab ID: 1627302031		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033596		Collected: 09/24/2016		
Lab ID: 1627302032		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033597		Collected: 09/24/2016		
Lab ID: 1627302033		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T033598		Collected: 09/24/2016		
Lab ID: 1627302034		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	1.0	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1627302
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Dimethylamine, Ethylamine, and Methylamine with values like <0.10 and 1.4.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Dimethylamine, Ethylamine, and Methylamine with values like <0.10 and 1.0.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Dimethylamine, Ethylamine, and Methylamine with values like <0.10 and 0.92.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Dimethylamine, Ethylamine, and Methylamine with values like <0.10 and 0.74.



# ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033603		Collected: 09/24/2016		
Lab ID: 1627302039		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg ((NBD) Chloride)		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.49	NA	NA	0.10

Sample ID: S16T033604		Collected: 09/24/2016		
Lab ID: 1627302040		Received: 09/28/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg ((NBD) Chloride)		Analyzed: 10/05/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.42	NA	NA	0.10

## Comments

Quality Control: Amines-VOA Aliphatic VAA-1 - (HBN: 177811)  
 LMB/LCS/LCSD 521154/521155/521156 batched with samples 001-020.

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
Amines-VOA Aliphatic VAA-1	/S/ Christopher Winter 10/05/2016 14:44	/S/ Thomas Bosch 10/05/2016 16:03

## Laboratory Contact Information

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# ANALYTICAL REPORT

Workorder: **34-1627302**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### 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	ANAB (DoD ELAP)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/bimp/">http://health.utah.gov/lab/bimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bdnlabservice.htm">http://ndep.nv.gov/bdnlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSnew/">http://www.deq.state.ok.us/CSnew/</a>
	Iowa	IA# 378	<a href="http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx">http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx</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>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
	Kansas	E-10418	<a href="http://www.kdheks.gov/lpo/index.html">http://www.kdheks.gov/lpo/index.html</a>
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

### Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.  
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.  
 ND = Not Detected, Testing result not detected above the LOD or LOQ.  
 NA = Not Applicable.  
 \* No result could be reported, see sample comments for details.  
 < This testing result is less than the numerical value.  
 ( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627302**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: IH Aliphatic Amines  
Batch: ILC/12777 (HBN: 177811)  
Analyzed By: Christopher Winter

### Blank

LMB: 521154			
Analyzed: 10/04/2016 15:01			
Units: ug/sample			
Analyte	Result	MDL	RL
Dimethylamine	ND	NA	0.100
Ethylamine	ND	NA	0.100
Methylamine	ND	NA	0.100

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521155					LCSD: 521156				
Analyzed: 10/04/2016 15:47					Analyzed: 10/04/2016 15:32				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Dimethylamine	3.84	4.00	96.0	60.4 134.6	3.89	97.1	1.06	0.0 20.0	
Ethylamine	4.52	4.00	113	40.0 160.0	4.34	109	3.97	0.0 20.0	
Methylamine	4.10	4.00	102	40.0 160.0	4.10	102	0.0488	0.0 20.0	

### Comments

LMB/LCS/LCSD 521154/521155/521156 batched with samples 001-020.

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Christopher Winter 10/05/2016 13:37	/S/ Thomas Bosch 10/05/2016 15:59

### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



**Quality Control Sample  
Batch Report**

**Analysis Information**

<b>Workorder: 1627302</b>		
Limits: Historical Performance	Preparation: NA	Analysis: IH Aliphatic Amines
Basis: ALS Laboratory Group	Batch: NA	Batch: ILC/12778 (HBN: 177812)
	Prepared By: NA	Analyzed By: Christopher Winter

**Blank**

LMB: 521157			
Analyzed: 10/04/2016 21:41			
Units: ug/sample			
Analyte	Result	MDL	RL
Dimethylamine	ND	NA	0.100
Ethylamine	ND	NA	0.100
Methylamine	ND	NA	0.100

**Laboratory Control Sample - Laboratory Control Sample Duplicate**

LCS: 521158					LCSID: 521159			
Analyzed: 10/05/2016 11:07					Analyzed: 10/04/2016 22:11			
Dilution: 1					Dilution: 1			
Units: ug/sample					Units: ug/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Dimethylamine	3.87	4.00	96.6	60.4 134.6	4.02	100	3.81	0.0 20.0
Ethylamine	3.95	4.00	98.8	40.0 160.0	4.77	119	18.8	0.0 20.0
Methylamine	3.99	4.00	99.8	40.0 160.0	4.23	106	5.91	0.0 20.0

**QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)**

Analyst	Peer Review
/S/ Christopher Winter 10/05/2016 14:44	/S/ Thomas Bosch 10/05/2016 16:03

**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
- ⊕ - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

1627302

### CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No. 20162970  
Page 1 of 4

Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 713-6861	MISYS 16-05 FAX 373-1878
SAF No.	Sample Origin CANTONMENT	Purchase Order/Charge Code 12103/CB28	
Project Title CHALLENGE EVALUATION	Logbook/Work Package No.	Temp. ON ICE	
Shipped To (Lab) A33	Method of Shipment	Bill of Lading/AVI Bill No. 8009 0227 8403	
Protocol S/A	Date Turnaround 16 DAYS	Parts and Return No. 41367	

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T033545	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-BAISE-EFF-A	N/A
	S16T033546	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-BAISE-IN	S/A
	S16T033547	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-BAISE-K	S/A
	S16T033548	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-BAISE-L	S/A
	S16T033549	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-A	S/A
	S16T033570	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-B	S/A
	S16T033571	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-C	S/A
	S16T033572	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-D	S/A
	S16T033573	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-E	S/A
	S16T033574	VA	9/23/16	XAD-7-H80	ANALYSIS 16-08635-4-EFF-F	S/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSOS  Yes  No

SPECIAL INSTRUCTIONS  
Send Results to Carl Howard IV & crew  
Carl Howard IV  
carl.howard@va.gov  
Gregory\_E\_Scanlan@va.gov see SCW for email.  
CONTRACT 33502  
RELEASE 9

Requisitioned By Dianne Turner JA Gradisher WRPS	Print Sign Date/Time 9/27/16 0930	Received By Julie Gadsden FEDEX	Print Sign Date/Time 9/27/16 0830
Requisitioned By JA Gradisher WRPS	Print Sign Date/Time 9/27/16 1400	Received By Michelle McNamee FEDEX	Print Sign Date/Time 9/27/16 1248P
Requisitioned By	Date/Time	Received By	Date/Time

Dispose Method (e.g., Return to customer, per lab procedure, use  progress)

FINAL SAMPLE DISPOSITION  
Conserved

Date/Time  
10/4/16 10:00

A-6003-962 (03/06)



Assembler		C.O.C. No. 20162970				
S/A		Page 2 of 4				
<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>						
Collector JONES	Contract/Requestor CARL HOWARD IV	Telephone No. 313-6841	MSIN 16-15 FAX 312-1878			
SAF No.	Sample Origin CHARITON EVALUATION	Purchase Order/Charge Code				
Trucked From CAMPTON EVALUATION	Lab/Work Package No.	Inv. Charge No.	Temp.			
Shipped To (Lab)	Method of Shipment	Bill of Lading/AV Bill No.	8009 0227 0403			
Precool	Date Turnaround	Parts and Return No.	41367			
S/A	10 DAYS					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	8167033575	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-D *	S/A
	8167033576	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-B *	S/A
	8167033577	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-A *	S/A
	8167033578	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-B *	S/A
	8167033579	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-C *	S/A
	8167033580	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-D *	S/A
	8167033581	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-E *	S/A
	8167033582	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-F *	S/A
	8167033583	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-G *	S/A
	8167033584	VA	9/23/16	XAD-7-88D	ANISES 16-08635-4-2B-H *	S/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)</b> MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No						
SPECIAL INSTRUCTIONS Send results to Carl Howard IV & Greg Carl M. Howard, Jr. and Gregory J. Scallan, Jr. see SOW for email. CONTRACT 55592						
Requisitioned By Dianne Turner WRPS	Print Sign Dianne Turner WRPS	Date/Time 9/16/16 0930	Received By JA Gradishar WRPS	Date/Time 9/16/16 0830	Matrix S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids	Matrix DL = Drum Liquids T = Tissue W = Waste L = Liquid V = Vegetation VA = Vapor X = Other DS = Drum Solids
Requisitioned By WRPS	Print Sign Julie Gradishar WRPS	Date/Time 9/16/16 1400	Received By FEDEX	Date/Time 9/16/16 1359		
Requisitioned By	Print Sign Marlene Schwartz	Date/Time	Received By Marlene Schwartz	Date/Time 9/16/16 1359		
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used process)	Disposed By Cory Smith	Date/Time 10/4/16			

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Assemble# N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		COC No. 20162970	Page 3 of 4	
Collector JONES	Contract/Requestor CARL HOWARD IV	Telephone No. 773-4861	MSIN 16-45	FAX 312-1878		
SUP No. N/A	Shipping Origin CARLISLE, EVALUATION	Purchase Order/Charge Code 30303/0320				
Project Title CARLISLE EVALUATION	Logbook Work Package No. N/A	Job Chest No. 173-913	Temp. ON Ice			
Shipped To (Lab) ALS	Method of Shipment	80 of Loading/AR Bill No. 8009 0227 8403				
Protocol N/A	Orig Turnaround LT DATE	Parts and Return No. 41367				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	8167033583	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-BASE-EFF *	N/A
	8167033586	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-BASE-2H *	N/A
	8167033587	VA	9/24/16	XOB-7-8B0	ANISES 16-08636-4-BLANK-EFF *	N/A
	8167033588	VA	9/24/16	XOB-7-8B0	ANISES 16-08636-4-BLANK-2H *	N/A
	8167033589	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-A *	N/A
	8167033590	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-B *	N/A
	8167033591	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-C *	N/A
	8167033592	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-D *	N/A
	8167033593	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-E *	N/A
	8167033594	VA	9/24/16	KAD-7-8B0	ANISES 16-08636-4-EFF-F *	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS (LHM as known wastes)</b> MSOS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send results to Carl Howard IV & Greg Scanlan Carl Howard IV: 773-4861, greg.scanlan@ars.com Greg Scanlan: 773-4861, greg.scanlan@ars.com CONTRACT 35102 RELEASE 9						
Requisitioned By Dianne Turner	Print J.A. Gradisher	Sign Dianne Turner	Date/Time 9/27/16 0930	Received By WRPS	Sign Julia Gordon	Date/Time 9/27/16 0930
Requisitioned By WRPS	Print J.A. Gradisher	Sign Julia Gordon	Date/Time 9/27/16 1420	Received By FEDEX	Sign No Name Selected	Date/Time 9/28/16 1250
Requisitioned By			Date/Time	Received By		Date/Time
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By C	Date/Time 10/4/16	Date/Time 10.8
<b>FINAL SAMPLE DISPOSITION</b> All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.						

Assembled N/A		COC. No. 20162970 Page 4 of 4						
Collector SOMER		Telephone No. 313-6861 MSN 16-15 FAX 312-1878						
ISAF No.		Purchase Order/Change Code						
Project Title CANTHINE EVALUATION		Ice Chest No. <u>WTS-013</u> Temp. <u>on ice</u>						
Shipped To (Lab)		Bill of Lading/Air Bill No. <u>8009 0227 9403</u>						
Protocol N/A		Parts and Return No. <u>41367</u>						
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								
Contact/Requestor CARL HOWARD IV		MSN 16-15 FAX 312-1878						
Sample Origin CANTHINE EVALUATION		Purchase Order/Change Code						
Logbook Work Package No.		Ice Chest No. <u>WTS-013</u> Temp. <u>on ice</u>						
Method of Shipment		Bill of Lading/Air Bill No. <u>8009 0227 9403</u>						
Data Turnaround 1-2 BUS		Parts and Return No. <u>41367</u>						
Sample Analysis								
Sample No.	Lab ID	Date	Time	No./Type Container	MSDS	Yes <input type="radio"/> No <input checked="" type="radio"/>	SPECIAL INSTRUCTIONS	Hold Time
8167033595	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-G		Send Results to Carl Howard IV & Greg Scanlan Carl.Howard@epa.gov and Gregory.L.Scanlan@epa.gov see SOI for email CONTRACT 55422	
8167033596	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-R			
8167033597	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-A			
8167033598	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-B			
8167033599	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-C			
8167033600	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-D			
8167033601	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-E			
8167033602	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-F			
8167033603	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-G			
8167033604	VA	9/24/16		XAD-7-880	MSDS 16-08436-4-2B-H			
Possibilities				MSDS		Yes <input type="radio"/> No <input checked="" type="radio"/>		Hold Time
Requested By <u>Dianne Turner</u> Sign <u>JA Ghidisher</u>				Date/Time <u>9/27/16</u> <u>0930</u>		Received By <u>WRPS Julie Cadogan</u> Sign <u>9/27/16</u> <u>0930</u>		Date/Time <u>9/27/16</u> <u>0930</u>
Requested By <u>WRPS</u>				Date/Time <u>9/27/16</u> <u>1400</u>		Received By <u>FEDEX</u>		Date/Time <u>10/4/16</u>
Requested By				Date/Time		Received By <u>Marlene Smith</u> Sign <u>9/27/16</u> <u>1040</u>		Date/Time <u>10/4/16</u>
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time		Disposed By <u>Carl</u> Sign <u>10/4/16</u>		Date/Time <u>10/4/16</u>

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.



# ANALYTICAL REPORT

Report Date: October 05, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert\_w\_sosa@rl.gov

20162972

Workorder: **34-1627294**

Client Project ID: Washington River Protection  
So

Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033645</b>		Collected: 09/23/2016		
Lab ID: 1627294001		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033646</b>		Collected: 09/23/2016		
Lab ID: 1627294002		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033647</b>		Collected: 09/23/2016		
Lab ID: 1627294003		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

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ALS GROUP USA, CORP. An ALS Limited Company

Environmental

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

RIGHT SOLUTIONS RIGHT PARTNER



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033648</b>		Collected: 09/23/2016		
Lab ID: 1627294004		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033649</b>		Collected: 09/23/2016		
Lab ID: 1627294005		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033650</b>		Collected: 09/23/2016		
Lab ID: 1627294006		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033651</b>		Collected: 09/23/2016		
Lab ID: 1627294007		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033652</b>		Collected: 09/23/2016		
Lab ID: 1627294008		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033653</b>		Collected: 09/23/2016		
Lab ID: 1627294009		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033654</b>		Collected: 09/23/2016		
Lab ID: 1627294010		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033655</b>		Collected: 09/23/2016		
Lab ID: 1627294011		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033656</b>		Collected: 09/23/2016		
Lab ID: 1627294012		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033657</b>		Collected: 09/23/2016		
Lab ID: 1627294013		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033658</b>		Collected: 09/23/2016		
Lab ID: 1627294014		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033659</b>		Collected: 09/23/2016		
Lab ID: 1627294015		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033660</b>		Collected: 09/23/2016		
Lab ID: 1627294016		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033661</b>		Collected: 09/23/2016		
Lab ID: 1627294017		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033662</b>		Collected: 09/23/2016		
Lab ID: 1627294018		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033663</b>		Collected: 09/23/2016		
Lab ID: 1627294019		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010





**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033664</b>		Collected: 09/23/2016		
Lab ID: 1627294020		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033665</b>		Collected: 09/24/2016		
Lab ID: 1627294021		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033666</b>		Collected: 09/24/2016		
Lab ID: 1627294022		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033667</b>		Collected: 09/24/2016		
Lab ID: 1627294023		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010



# ANALYTICAL REPORT

Workorder: **34-1627294**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033668</b>		Collected: 09/24/2016		
Lab ID: 1627294024		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033669</b>		Collected: 09/24/2016		
Lab ID: 1627294025		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033670</b>		Collected: 09/24/2016		
Lab ID: 1627294026		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033671</b>		Collected: 09/24/2016		
Lab ID: 1627294027		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033672</b>		Collected: 09/24/2016		
Lab ID: 1627294028		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/30/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033673</b>		Collected: 09/24/2016		
Lab ID: 1627294029		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033674</b>		Collected: 09/24/2016		
Lab ID: 1627294030		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<b>0.047</b>	NA	NA	0.010

Sample ID: <b>S16T033675</b>		Collected: 09/24/2016		
Lab ID: 1627294031		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033676</b>		Collected: 09/24/2016		
Lab ID: 1627294032		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033677</b>		Collected: 09/24/2016		
Lab ID: 1627294033		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033678</b>		Collected: 09/24/2016		
Lab ID: 1627294034		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033679</b>		Collected: 09/24/2016		
Lab ID: 1627294035		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



**ANALYTICAL REPORT**

Workorder: **34-1627294**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033680</b>		Collected: 09/24/2016		
Lab ID: 1627294036		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033681</b>		Collected: 09/24/2016		
Lab ID: 1627294037		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	0.092	NA	NA	0.010

Sample ID: <b>S16T033682</b>		Collected: 09/24/2016		
Lab ID: 1627294038		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: <b>S16T033683</b>		Collected: 09/24/2016		
Lab ID: 1627294039		Received: 09/28/2016		
Method: <b>NIOSH 1606</b>		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/01/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
<b>Analyte</b>	<b>Result (mg/sample)</b>	<b>Result (mg/m<sup>3</sup>)</b>	<b>Result (ppm)</b>	<b>RL (mg/sample)</b>
Acetonitrile	<0.010	NA	NA	0.010



# ANALYTICAL REPORT

Workorder: **34-1627294**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### Analytical Results

Sample ID: S16T033684	Collected: 09/24/2016			
Lab ID: 1627294040	Received: 09/28/2016			
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			
	Analyzed: 10/01/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1606	/S/ Young Hee Yoon 10/04/2016 14:15	/S/ Thomas J. Masoian 10/05/2016 08:37

### Laboratory Contact Information

ALS Environmental  
 960 W Levoy Drive  
 Salt Lake City, Utah 84123

Phone: (801) 266-7700  
 Email: [alslt.lab@ALSGlobal.com](mailto:alslt.lab@ALSGlobal.com)  
 Web: [www.alsinc.com](http://www.alsinc.com)



# ANALYTICAL REPORT

Workorder: **34-1627294**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### 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	ANAB (DoD ELAP)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
	Utah (NELAC)	DATA 1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bd/wlabservice.htm">http://ndep.nv.gov/bd/wlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CS/new/">http://www.deq.state.ok.us/CS/new/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/inside/CNR/Regulatory/Water.aspx">http://www.iowadnr.gov/inside/CNR/Regulatory/Water.aspx</a>
	Texas (TNI)	T 104704456-11-1	<a href="http://www.tceq.texas.gov/field/qalab_accred_certif.html">http://www.tceq.texas.gov/field/qalab_accred_certif.html</a>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/sep/labs/index.html">http://www.ecy.wa.gov/programs/sep/labs/index.html</a>
Industrial Hygiene	Kansas	E-10416	<a href="http://www.kdheks.gov/lpo/index.html">http://www.kdheks.gov/lpo/index.html</a>
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccredite-diabs.org">http://www.aihaaccredite-diabs.org</a>
Lead Testing:	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/sep/labs/index.html">http://www.ecy.wa.gov/programs/sep/labs/index.html</a>
	CPSC	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccredite-diabs.org">http://www.aihaaccredite-diabs.org</a>
	Dietary Supplements	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

### Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.  
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.  
 ND = Not Detected, Testing result not detected above the LOD or LOQ.  
 NA = Not Applicable.  
 \*\* No result could be reported, see sample comments for details.  
 < This testing result is less than the numerical value.  
 ( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627294**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: BH GC-FID QC  
Batch: IFID/7795 (HBN: 177533)  
Analyzed By: Young Hee Yoon

### Blank

MB: 520569			
Analyzed: 09/30/2016 00:00			
Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

MB: 520572			
Analyzed: 09/30/2016 00:00			
Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520570					LCSD: 520571				
Analyzed: 09/30/2016 00:00					Analyzed: 09/30/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.332	0.312	106	86.6   115.3	0.323	104	2.75	0.0   20.0	

LCS: 520573					LCSD: 520574				
Analyzed: 09/30/2016 00:00					Analyzed: 09/30/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.272	0.281	96.9	86.6   115.3	0.260	92.6	4.51	0.0   20.0	

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Young Hee Yoon 10/04/2016 14:15	/S/ Thomas J. Masoian 10/05/2016 08:36

### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable.



11077894

C.O.C. No. 20162972  
Page 1 of 4

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Collector: JONES  
 Project Type: CARTRIDGE EVALUATION  
 Shipped To (Lab): ALS  
 Protocol: N/A  
 Contact/Requestor: CARL HOWARD IV  
 Sample Origin: CARTRIDGE EVALUATION  
 Logbook Work Package No.: N/A  
 Method of Storage: N/A  
 Telephone No.: 313-5581  
 Purchase Order/Change Code: 250003/CASD  
 Use Chest No.: WTS-013  
 Temp.: 0.010  
 Bill of Lading/IR Bill No.: 8009  
 Parts and Return No.: 41367

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
5167032645	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-BASE-EFF *	N/A
5167032646	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-BASE-IN *	N/A
5167032647	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-ELUENT *	N/A
5167032648	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-ELUENT *	N/A
5167032649	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-A *	N/A
5167032650	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-B *	N/A
5167032651	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-C *	N/A
5167032652	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-D *	N/A
5167032653	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-E *	N/A
5167032654	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08433-5-RT-F *	N/A

POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSDS  Yes  No  
 SPECIAL INSTRUCTIONS  
 Send Results to Carl Howard IV & Greg  
 Carl Howard IV  
 Gregory J. Scanziani  
 gregory\_j\_scanziani@als.com  
 Reference Contract # 55502

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
David Warner	JA Gradshek	David Warner	9/27/16 8:30	Julia Gradshek	Julia Gradshek	9/27/16 0830	SE	DL = Dura Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor A = Air X = Other DS = Dura Solids
WRBS	WRBS	Julia Gradshek	9/27/16 1400	Received by	Received by		SL = Sludge W = Water O = Oil A = Air DS = Dura Solids	
Relinquished by				Received by				

Disposal Method (e.g., Return to customer, per lab procedure, used in process)  
 Disposed by: Greg Howard IV on Oct 1, 2016 1:00 PM  
 All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

C.O.C. No. 20162972 Page 2 of 4						
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						
Assembler N/A	Collector DAMI HOWARD IV	Telephone No. 713-4861				
Sample No. N/A	Shipping Order/Charge Code 2020307020	MISN 56-02 FAX 372-1874				
Project Title Custodial Insurance	Logbook VNR Package No. N/A	Temp. 0.2 IS6				
Shipped To (Lab) JCS	Method of Shipment Delta Turbocord	Bill of Lading/Air Bill No. 8009 0227 8403				
Protocol N/A	Lab ID	Peris and Return No. 41367				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
8167033655	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-EFF-G	N/A
8167033656	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-EFF-H	N/A
8167033657	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-A	N/A
8167033658	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-B	N/A
8167033659	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-C	N/A
8167033660	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-D	N/A
8167033661	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-E	N/A
8167033662	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-F	N/A
8167033663	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-G	N/A
8167033664	VA	9/23/16		CHARCOAL TUBE	Acetonitrile 16-08635-3-TR-H	N/A
POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSOS <input type="radio"/> Yes <input checked="" type="radio"/> No						
SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Scanlon Scanlon@regislab.com and greg@regislab.com for email REGISLAB S Reference Contract # 55502						
Requested by Dennis Turner WRPS	Signature Dennis Turner	Date/Time 9/27/16 8:00	Received by Julie Gadsden	Signature Julie Gadsden	Date/Time 9/27/16 8:30	Matrix S = Sol DL = Drum Liquids SE = Sediment SO = Solid SL = Sludge VV = Water O = Oil A = Air DS = Drum Solids
Requested by WRPS	Signature Julie Gadsden	Date/Time 9/27/16 1:00	Received by Nancy Schmitt	Signature Nancy Schmitt	Date/Time 9/27/16 1:00	Matrix T = Tissue NI = N/A L = Liquid V = Vegetation VA = Vapor X = Other
Requested by			Received by			
Disposal Method (e.g., Return to customer, per lab procedure, used in process)						
Young N. Gyn Oct 1, 2016 1:00 PM						
All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.						

A-6000-602 (03/05)

Assemble		C.O.C. No. 20162972	
M/A		Page 3 of 4	
Collector Name	Collection Requestor	Telephone No.	MSRN
SNP No.	CAUTION: 27	373-6961	56-02
Project Title	Site Characterization	Analysis Order/Change Code	FAX 372-3878
Location	2301/2427		
Shipped To (Lab)	Logbook Work Package No.	See Chest No.	Temp.
Method of Shipment		675-013	0.0 FOC
Protocol		Bill of Lading/ Bill No.	8009 0227 8493
		Parts and Return No.	41367

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
8167033665	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-BASE-EFF	N/A
8167033666	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-BASE-IN	N/A
8167033667	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-BASE-EFF	N/A
8167033668	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-BASE-IN	N/A
8167033669	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-A	N/A
8167033670	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-B	N/A
8167033671	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-C	N/A
8167033672	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-D	N/A
8167033673	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-E	N/A
8167033674	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08634-3-EFF-F	N/A

POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSDS  Yes  No

SPECIAL INSTRUCTIONS  
 Send Results to Carl Rowald IV & Greg Scanlan  
 Email: rowaldc@wrps.com and gregory\_s\_scanlan@wrps.com for email  
 8002438 9  
 Reference Contract # 55502

Requested by	Sign	Date/Time	Received by	Sign	Date/Time	Mark*
Dianne Turner	Dianne Turner	9/21/16 0930	Julia Radwan	Julia Radwan	9/27/16 0830	S = Sol SE = Sediment SO = SO2 SL = Sludge WV = Water O = Oil A = Air DS = Deum Solids
WRPS	WRPS	9/21/16 1400	FEDEX	FEDEX		DL = Deum Liquids T = Tissue M = Mgt L = Liquid V = Vegetation VA = Vapor X = Other DS = Deum Solids
Requested by	Requested by	Date/Time	Requested by	Requested by	Date/Time	

Disposal Method (e.g., Return to customer, per lab procedure, land in process)

Disposing by: WRPS on 10/1/2016 12:00 PM

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6000-662 (03/16)

Assembled		C.O.C. No. 20162972					
S/A		Page 4 of 4					
Collector JONES		Telephone No. 313-8861					
SNAP No.		MSN 15-38 FAX 312-18718					
Project Title		Sample Origin					
CHARITABLE EVALUATION		Logbook/Work Package Code					
Shipped To (Lab)		Ice Chest No. WTS-013					
Protocol		Temp. 0.0 Ice					
S/A		Bill of Lading/air Bill No. 8009					
		Parts and Return No. 41367					
		Delta Turnaround LE days					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
8167033675	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-EFT-G	N/A	
8167033676	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-EFT-B	N/A	
8167033677	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-18-A	N/A	
8167033678	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-18-B	N/A	
8167033679	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-19-C	N/A	
8167033680	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-19-D	N/A	
8167033681	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-19-E	N/A	
8167033682	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-20-F	N/A	
8167033683	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-20-G	N/A	
8167033684	VA	9/24/16		CHARCOAL TUBE	Acetonitrile 16-08636-3-20-H	N/A	
<p>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>SPECIAL INSTRUCTIONS            Send results to Carl Rowald 37 6 600            Carl X Rowald@rl.gov and            Gregory J. Scanlan@rl.gov for email            RELEASE 9            Reference Contract # 95502</p>							
Relinquished by		Date/Time		Received by		Date/Time	
Dwayne Turner		9/27/16 1400		Jillie Radtch		9/27/16 0930	
Relinquished by		Date/Time		Received by		Date/Time	
JA Gradisher		9/27/16 1400		FEDEX			
Relinquished by		Date/Time		Received by		Date/Time	
WRPS		9/27/16 1400		M. Schmitt		9/28/16 1300	
Relinquished by		Date/Time		Received by		Date/Time	
				M. Schmitt		9/28/16 1300	
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, cold in process)		Disposition		Date/Time	
				Jug in the bin Oct 1, 2016 1:00 PM			

A-6003-662 (03/05)

**FINAL REPORT ON MERCURY VAPOR TUBES  
FOR CARTRIDGE EVALUATION  
COLLECTED SEPTEMBER 23 - 24, 2016**

**Document No.: 20162958 Rev. 0**

**Michael A. Purcell**  
WAI Hanford Laboratory

**Date Published**  
October 26, 2016



Prepared for:

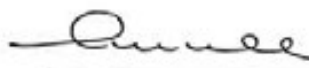
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October 26, 2016  
Michael A. Purcell, WHL Project Coordinator

## NARRATIVE

**FINAL REPORT ON MERCURY VAPOR TUBES  
FOR CARTRIDGE EVALUATION  
COLLECTED SEPTEMBER 23 -- 24, 2016**

This final report presents the results of forty mercury vapor tubes received at the 222-S Laboratory on September 26, 2016, in good condition and with adequate paperwork. The mercury vapor tubes were logged into sample delivery group 20162958.

**DISCLAIMERS**

- The information contained in this report is intended only for the use of the addressee and should be considered confidential.
- This report shall not be reproduced, except in full, without written approval of the laboratory.
- The results shown in this report pertain only to the actual samples tested.
- These results conform to the requirements specified in the referenced methods/procedures and specifications provided verbally or electronically by the customer. Any deviations or modifications are discussed in the following narrative.
- This report only addresses laboratory activities related to the listed surveys. Requirements or anomalies concerning field sampling are not addressed in this report.

**PROCEDURES**

Method	Preparation Procedure	Analysis Procedure
Mercury by OSHA ID-140	LA-325-109, Rev. 2-4	LA-325-109, Rev. 2-4

**ANALYTICAL SUMMARY**

The vapor tubes were tested for mercury, as specified on the chain of custody. Standard laboratory procedures for digestions and cold vapor atomic absorption for mercury were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory* (QAPP). Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control standards (LCS). For mercury, the results of 178 LCS determinations indicate a mean recovery of 98% with a standard deviation of 6%. Statistical process control limits for the LCS are 81 – 115%, with no significant bias. The overall estimate of uncertainty is 12%, with coverage factor (k) = 2.

Background levels of mercury or interfering compounds can be present in the sorbent tube media used for collecting vapor samples. OSHA ID-140 recommends that the laboratory determine the average background for each lot of media and subtract it from the sample results prior to reporting. However, per agreement with the client, this background is being determined by the client using blank media submitted as blind samples to the laboratory. Any blank subtraction from the sample results will be performed by the client. The laboratory is using the same media

for QC samples. These QC samples may not match the lot numbers of the samples being submitted and the background for this QC sample media has not been determined. Over the past several years the results from preparation blanks, field blanks, and the vast majority of samples have been below the laboratory's method detection limit, which is an order of magnitude below the reporting limit. In general, the laboratory believes there is no need for background subtraction using the current sample media (Hydrar, SKC 226-17-1A).

For the mercury analysis, the blank results for tube lot number 9473 were below the detection limit; therefore, no blank correction was required. All mercury results for this sample group were below the reporting limit of 0.05 µg/sample, except for sample 16-08635-6-IN-G. For this sample, both the resin and glass wool portions were below the reporting limit, but the total of the two was above the reporting limit (see Attachment 1).

20162958 Rev. 0

Attachment 1

DATA SUMMARY REPORT

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C.282



## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162598

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08635-6-BASE-EFF	Total	S16T033316	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-BASE-EFF	Resin	S16T033317	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BASE-EFF	Glass Wool	S16T033318	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BASE-IN	Total	S16T033320	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-BASE-IN	Resin	S16T033322	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BASE-IN	Glass Wool	S16T033325	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BLANK1	Total	S16T033328	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-BLANK1	Resin	S16T033329	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BLANK1	Glass Wool	S16T033330	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BLANK2	Total	S16T033331	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-BLANK2	Resin	S16T033332	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-BLANK2	Glass Wool	S16T033333	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-A	Total	S16T033334	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-A	Resin	S16T033335	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-A	Glass Wool	S16T033336	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-B	Total	S16T033337	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-B	Resin	S16T033338	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-B	Glass Wool	S16T033339	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-C	Total	S16T033344	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-C	Resin	S16T033345	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-C	Glass Wool	S16T033346	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-D	Total	S16T033347	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-D	Resin	S16T033348	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-D	Glass Wool	S16T033349	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-E	Total	S16T033350	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-E	Resin	S16T033351	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-E	Glass Wool	S16T033352	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-F	Total	S16T033353	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-F	Resin	S16T033354	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-F	Glass Wool	S16T033355	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-G	Total	S16T033356	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-G	Resin	S16T033357	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-G	Glass Wool	S16T033358	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-H	Total	S16T033359	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-EFF-H	Resin	S16T033360	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-EFF-H	Glass Wool	S16T033361	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-A	Total	S16T033362	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-A	Resin	S16T033363	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-A	Glass Wool	S16T033364	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-B	Total	S16T033365	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-B	Resin	S16T033366	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-B	Glass Wool	S16T033367	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-C	Total	S16T033368	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-C	Resin	S16T033369	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-C	Glass Wool	S16T033370	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-D	Total	S16T033371	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-D	Resin	S16T033372	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-D	Glass Wool	S16T033373	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500

## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162598

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08635-6-IN-E	Total	S16T033374	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-E	Resin	S16T033375	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-E	Glass Wool	S16T033376	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-F	Total	S16T033377	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-F	Resin	S16T033378	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-F	Glass Wool	S16T033379	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-G	Total	S16T033380	Mercury	µg/sample	n/a	<0.0500	0.0543	0.0500
16-08635-6-IN-G	Resin	S16T033381	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-G	Glass Wool	S16T033382	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-H	Total	S16T033383	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08635-6-IN-H	Resin	S16T033384	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08635-6-IN-H	Glass Wool	S16T033385	Mercury	µg/sample	95.9	<0.0500	<0.0500	0.0500
16-08636-6-BASE-EFF	Total	S16T033386	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-BASE-EFF	Resin	S16T033387	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BASE-EFF	Glass Wool	S16T033388	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BASE-IN	Total	S16T033389	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-BASE-IN	Resin	S16T033390	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BASE-IN	Glass Wool	S16T033391	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-EFF	Total	S16T033392	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-EFF	Resin	S16T033393	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-EFF	Glass Wool	S16T033394	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-IN	Total	S16T033395	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-IN	Resin	S16T033397	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-BLANK-IN	Glass Wool	S16T033398	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-A	Total	S16T033401	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-A	Resin	S16T033403	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-A	Glass Wool	S16T033404	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-B	Total	S16T033407	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-B	Resin	S16T033409	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-B	Glass Wool	S16T033410	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-C	Total	S16T033411	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-C	Resin	S16T033412	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-C	Glass Wool	S16T033413	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-D	Total	S16T033414	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-D	Resin	S16T033415	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-D	Glass Wool	S16T033416	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-E	Total	S16T033417	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-E	Resin	S16T033420	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-E	Glass Wool	S16T033421	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-F	Total	S16T033423	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-F	Resin	S16T033427	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-F	Glass Wool	S16T033428	Mercury	µg/sample	92.3	<0.0500	<0.0500	0.0500
16-08636-6-EFF-G	Total	S16T033434	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-G	Resin	S16T033436	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-EFF-G	Glass Wool	S16T033437	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-EFF-H	Total	S16T033440	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-EFF-H	Resin	S16T033442	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-EFF-H	Glass Wool	S16T033443	Mercury	µg/sample	90.9	<0.0500	<0.0500	0.0500

## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162598

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08636-6-IN-A	Total	S16T033446	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-A	Resin	S16T033448	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-A	Glass Wool	S16T033449	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-B	Total	S16T033452	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-B	Resin	S16T033456	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-B	Glass Wool	S16T033457	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-C	Total	S16T033459	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-C	Resin	S16T033460	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-C	Glass Wool	S16T033461	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-D	Total	S16T033464	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-D	Resin	S16T033466	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-D	Glass Wool	S16T033467	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-E	Total	S16T033470	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-E	Resin	S16T033472	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-E	Glass Wool	S16T033473	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-F	Total	S16T033476	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-F	Resin	S16T033477	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-F	Glass Wool	S16T033478	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-G	Total	S16T033479	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-G	Resin	S16T033480	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-G	Glass Wool	S16T033488	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-H	Total	S16T033522	Mercury	ug/sample	n/a	<0.0500	<0.0500	0.0500
16-08636-6-IN-H	Resin	S16T033523	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500
16-08636-6-IN-H	Glass Wool	S16T033524	Mercury	ug/sample	90.9	<0.0500	<0.0500	0.0500

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Attachment 2

ANALYSIS DATE REPORT

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## ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162958

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T033317	16-08635-6-BASE-EFF	Mercury	09/30/2016 08:00	09/30/2016 17:26
S16T033318	16-08635-6-BASE-EFF	Mercury	09/30/2016 08:00	09/30/2016 17:28
S16T033322	16-08635-6-BASE-IN	Mercury	09/30/2016 08:00	09/30/2016 17:30
S16T033325	16-08635-6-BASE-IN	Mercury	09/30/2016 08:00	09/30/2016 17:32
S16T033329	16-08635-6-BLANK1	Mercury	09/30/2016 08:00	09/30/2016 17:33
S16T033330	16-08635-6-BLANK1	Mercury	09/30/2016 08:00	09/30/2016 17:35
S16T033332	16-08635-6-BLANK2	Mercury	09/30/2016 08:00	09/30/2016 17:40
S16T033333	16-08635-6-BLANK2	Mercury	09/30/2016 08:00	09/30/2016 17:41
S16T033335	16-08635-6-EFF-A	Mercury	09/30/2016 08:00	09/30/2016 17:43
S16T033336	16-08635-6-EFF-A	Mercury	09/30/2016 08:00	09/30/2016 17:45
S16T033338	16-08635-6-EFF-B	Mercury	09/30/2016 08:00	09/30/2016 17:46
S16T033339	16-08635-6-EFF-B	Mercury	09/30/2016 08:00	09/30/2016 17:48
S16T033345	16-08635-6-EFF-C	Mercury	09/30/2016 08:00	09/30/2016 17:50
S16T033346	16-08635-6-EFF-C	Mercury	09/30/2016 08:00	09/30/2016 17:51
S16T033348	16-08635-6-EFF-D	Mercury	09/30/2016 08:00	09/30/2016 17:53
S16T033349	16-08635-6-EFF-D	Mercury	09/30/2016 08:00	09/30/2016 17:55
S16T033351	16-08635-6-EFF-E	Mercury	09/30/2016 08:00	09/30/2016 17:59
S16T033352	16-08635-6-EFF-E	Mercury	09/30/2016 08:00	09/30/2016 18:01
S16T033354	16-08635-6-EFF-F	Mercury	09/30/2016 08:00	09/30/2016 18:03
S16T033355	16-08635-6-EFF-F	Mercury	09/30/2016 08:00	09/30/2016 18:04
S16T033357	16-08635-6-EFF-G	Mercury	09/30/2016 08:00	09/30/2016 18:12
S16T033358	16-08635-6-EFF-G	Mercury	09/30/2016 08:00	09/30/2016 18:13
S16T033360	16-08635-6-EFF-H	Mercury	09/30/2016 08:00	09/30/2016 18:19
S16T033361	16-08635-6-EFF-H	Mercury	09/30/2016 08:00	09/30/2016 18:21
S16T033363	16-08635-6-IN-A	Mercury	09/30/2016 08:00	09/30/2016 18:22
S16T033364	16-08635-6-IN-A	Mercury	09/30/2016 08:00	09/30/2016 18:24
S16T033366	16-08635-6-IN-B	Mercury	09/30/2016 08:00	09/30/2016 18:26
S16T033367	16-08635-6-IN-B	Mercury	09/30/2016 08:00	09/30/2016 18:27
S16T033369	16-08635-6-IN-C	Mercury	09/30/2016 08:00	09/30/2016 18:29
S16T033370	16-08635-6-IN-C	Mercury	09/30/2016 08:00	09/30/2016 18:31
S16T033372	16-08635-6-IN-D	Mercury	09/30/2016 08:00	09/30/2016 18:32
S16T033373	16-08635-6-IN-D	Mercury	09/30/2016 08:00	09/30/2016 18:34
S16T033375	16-08635-6-IN-E	Mercury	09/30/2016 08:00	09/30/2016 18:40
S16T033376	16-08635-6-IN-E	Mercury	09/30/2016 08:00	09/30/2016 18:42
S16T033378	16-08635-6-IN-F	Mercury	09/30/2016 08:00	09/30/2016 18:43
S16T033379	16-08635-6-IN-F	Mercury	09/30/2016 08:00	09/30/2016 18:45
S16T033381	16-08635-6-IN-G	Mercury	09/30/2016 08:00	09/30/2016 18:46
S16T033382	16-08635-6-IN-G	Mercury	09/30/2016 08:00	09/30/2016 18:48
S16T033384	16-08635-6-IN-H	Mercury	09/30/2016 08:00	09/30/2016 18:50
S16T033385	16-08635-6-IN-H	Mercury	09/30/2016 08:00	09/30/2016 18:52
S16T033387	16-08636-6-BASE-EFF	Mercury	09/30/2016 19:00	10/03/2016 13:23
S16T033388	16-08636-6-BASE-EFF	Mercury	09/30/2016 19:00	10/03/2016 13:24
S16T033390	16-08636-6-BASE-IN	Mercury	09/30/2016 19:00	10/03/2016 13:26
S16T033391	16-08636-6-BASE-IN	Mercury	09/30/2016 19:00	10/03/2016 13:28
S16T033393	16-08636-6-BLANK-EFF	Mercury	09/30/2016 19:00	10/03/2016 13:29
S16T033394	16-08636-6-BLANK-EFF	Mercury	09/30/2016 19:00	10/03/2016 13:31

## ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162958

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T033397	16-08636-6-BLANK-IN	Mercury	09/30/2016 19:00	10/03/2016 13:36
S16T033398	16-08636-6-BLANK-IN	Mercury	09/30/2016 19:00	10/03/2016 13:37
S16T033403	16-08636-6-EFF-A	Mercury	09/30/2016 19:00	10/03/2016 13:39
S16T033404	16-08636-6-EFF-A	Mercury	09/30/2016 19:00	10/03/2016 13:41
S16T033409	16-08636-6-EFF-B	Mercury	09/30/2016 19:00	10/03/2016 13:42
S16T033410	16-08636-6-EFF-B	Mercury	09/30/2016 19:00	10/03/2016 13:44
S16T033412	16-08636-6-EFF-C	Mercury	09/30/2016 19:00	10/03/2016 13:45
S16T033413	16-08636-6-EFF-C	Mercury	09/30/2016 19:00	10/03/2016 13:47
S16T033415	16-08636-6-EFF-D	Mercury	09/30/2016 19:00	10/03/2016 13:49
S16T033416	16-08636-6-EFF-D	Mercury	09/30/2016 19:00	10/03/2016 13:50
S16T033420	16-08636-6-EFF-E	Mercury	09/30/2016 19:00	10/03/2016 13:55
S16T033421	16-08636-6-EFF-E	Mercury	09/30/2016 19:00	10/03/2016 13:57
S16T033427	16-08636-6-EFF-F	Mercury	09/30/2016 19:00	10/03/2016 13:58
S16T033428	16-08636-6-EFF-F	Mercury	09/30/2016 19:00	10/03/2016 14:00
S16T033436	16-08636-6-EFF-G	Mercury	09/30/2016 19:00	10/03/2016 14:06
S16T033437	16-08636-6-EFF-G	Mercury	09/30/2016 19:00	10/03/2016 14:08
S16T033442	16-08636-6-EFF-H	Mercury	09/30/2016 19:00	10/03/2016 14:13
S16T033443	16-08636-6-EFF-H	Mercury	09/30/2016 19:00	10/03/2016 14:15
S16T033448	16-08636-6-IN-A	Mercury	09/30/2016 19:00	10/03/2016 14:16
S16T033449	16-08636-6-IN-A	Mercury	09/30/2016 19:00	10/03/2016 14:18
S16T033456	16-08636-6-IN-B	Mercury	09/30/2016 19:00	10/03/2016 14:20
S16T033457	16-08636-6-IN-B	Mercury	09/30/2016 19:00	10/03/2016 14:22
S16T033460	16-08636-6-IN-C	Mercury	09/30/2016 19:00	10/03/2016 14:23
S16T033461	16-08636-6-IN-C	Mercury	09/30/2016 19:00	10/03/2016 14:25
S16T033466	16-08636-6-IN-D	Mercury	09/30/2016 19:00	10/03/2016 14:27
S16T033467	16-08636-6-IN-D	Mercury	09/30/2016 19:00	10/03/2016 14:29
S16T033472	16-08636-6-IN-E	Mercury	09/30/2016 19:00	10/03/2016 14:34
S16T033473	16-08636-6-IN-E	Mercury	09/30/2016 19:00	10/03/2016 14:36
S16T033477	16-08636-6-IN-F	Mercury	09/30/2016 19:00	10/03/2016 14:37
S16T033478	16-08636-6-IN-F	Mercury	09/30/2016 19:00	10/03/2016 14:39
S16T033480	16-08636-6-IN-G	Mercury	09/30/2016 19:00	10/03/2016 14:41
S16T033488	16-08636-6-IN-G	Mercury	09/30/2016 19:00	10/03/2016 14:43
S16T033523	16-08636-6-IN-H	Mercury	09/30/2016 19:00	10/03/2016 14:44
S16T033524	16-08636-6-IN-H	Mercury	09/30/2016 19:00	10/03/2016 14:46

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Attachment 3

RECEIPT PAPERWORK

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*Cartridge Testing & Cartridge Testing*

222-S	<b>SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST</b>			ATS-LO-090-101 Rev DG-1
Date Samples Received: <u>9-26-16</u> Total Number of Samples: <u>480</u> Group #: <u>20162958-Hg</u>				
Sample Custodian: <u>Dianne Turner</u> IH Technician: <u>Paul Spaulding 9-26-16</u>				
Sample Custodian to Complete:				
Action	Yes	No	N/A	Comments
RSR provided?			✓	
Verify GKI is complete			✓	<input type="checkbox"/> In Project File
Received from an alpha facility?		✓		<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	70 60			<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) noted on the COC/RSA and sample bottles			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			
Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.				
Samples acceptable for release? <u>yes</u> PC/SC Initials <u>DLT</u> Date <u>9/26/16</u>				
If No, comment on communication and resolution:				
WRPS SHIP-280 Run-120 WHL Run-(80) 40NH <sub>3</sub> 40Hg Acetaminide 40				
Number of IH Samples Received:				
Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe: _____	1,3-Butadiene: <u>80</u>
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVOA: <u>40</u>	VOA: <u>40</u>	Other-IH: _____



**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

Contractor: Washington River Protection Solutions				Date Sampled: 09/23/2016	
CACN: 202367		COA: CB20		Survey No.: 16-08635 - Cartridge Testing	
Contact Name: Jones, Parker L			Phone: (509)373-4968		Turnaround: N/A
Return Report To: Caldwell, Joyce A				MSIN: R1-08	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
5167033316	16-08635-6-BASE-EFF / Hydrar (SKC 226-17-1A) . 5167033317 5167033318	Hg-Elemental Source 1			
5167033320	16-08635-6-BASE-IN / Hydrar (SKC 226-17-1A) . 5167033322 5167033325	Hg-Elemental Source 2			
5167033328	16-08635-6-BLANK1 / Hydrar (SKC 226-17-1A) - 5167033329 5167033330	Hg-Elemental Source 3			
5167033331	16-08635-6-BLANK2 / Hydrar (SKC 226-17-1A) - 5167033332 5167033333	Hg-Elemental Source 4			
5167033334	16-08635-6-EFF-A / Hydrar (SKC 226-17-1A) . 5167033335 5167033336	Hg-Elemental Source 5			
5167033337	16-08635-6-EFF-B / Hydrar (SKC 226-17-1A) . 5167033338 5167033339	Hg-Elemental Source 6			
5167033344	16-08635-6-EFF-C / Hydrar (SKC 226-17-1A) . 5167033345 5167033346	Hg-Elemental Source 7			
5167033347	16-08635-6-EFF-D / Hydrar (SKC 226-17-1A) . 5167033348 5167033349	Hg-Elemental Source 8			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>Eric Wheeler</i>	Eric Wheeler	2704HV H104	09-24-16	0500
Retrieved from Storage:	<i>Chris Moaw</i>	Chris Moaw		9/20/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>Chris Moaw</i>	Chris Moaw	9-26-16	1200	
Received By:	<i>Dianne Turner</i>	Dianne Turner	9-26-16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

Contractor: Washington River Protection Solutions			Date Sampled: 09/23/2016		
CACN: 202367		COA: CB20	Survey No.: 16-08635 - Cartridge Testing		
Contact Name: Jones, Parker L		Phone: (509)373-4966		Turnaround: N/A	
Return Report To: Caldwell, Joyce A			MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
516T033350	16-08635-6-EFF-E / Hydrar (SKC 226-17-1A) , 516T033351 516T033352	Hg-Elemental Source 9			
516T033353	16-08635-6-EFF-F / Hydrar (SKC 226-17-1A) , 516T033354 516T033355	Hg-Elemental Source 10			
516T033356	16-08635-6-EFF-G / Hydrar (SKC 226-17-1A) , 516T033357 516T033358	Hg-Elemental Source 11			
516T033359	16-08635-6-EFF-H / Hydrar (SKC 226-17-1A) , 516T033360 516T033361	Hg-Elemental Source 12			
516T033362	16-08635-6-IN-A / Hydrar (SKC 226-17-1A) , 516T033363 516T033364	Hg-Elemental Source 13			
516T033365	16-08635-6-IN-B / Hydrar (SKC 226-17-1A) , 516T033366 516T033367	Hg-Elemental Source 14			
516T033368	16-08635-6-IN-C / Hydrar (SKC 226-17-1A) , 516T033369 516T033370	Hg-Elemental Source 15			
516T033371	16-08635-6-IN-D / Hydrar (SKC 226-17-1A) , 516T033372 516T033373	Hg-Elemental Source 16			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>Erica Wheeler</i>	Erica Wheeler	2764 HV +164	09-24-16	0500
Retrieved from Storage:	<i>Chastie Maxwell</i>	Chastie Maxwell		9/26/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>Chastie Maxwell</i>	Chastie Maxwell	9/26/16	1200	
Received By:	<i>Dianne Turner</i>	Dianne Turner	9/26/16	12:00	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 09/23/2015		
CAGN: 202367		COA: CB20		Survey No.: 16-08635 - Cartridge Testing	
Contact Name: Jones, Parker L			Phone: (509)373-4966		Turnaround: N/A
Return Report To: Caldwell, Joyce A			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
5167033374	16-08635-6-IN-E / Hydrar (SKC 226-17-1A) 5167033375 5167033376	Hg-Elemental Source 17			
5167033377	16-08635-6-IN-F / Hydrar (SKC 226-17-1A) 5167033378 5167033379	Hg-Elemental Source 18			
5167033380	16-08635-6-IN-G / Hydrar (SKC 226-17-1A) 5167033381 5167033382	Hg-Elemental Source 19			
5167033383	16-08635-6-IN-H / Hydrar (SKC 226-17-1A) 5167033384 5167033385	Hg-Elemental Source 20			
<del>16-08635-7-BASE-EFF / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08635-7-BASE-IN / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08635-7-BLANK1 / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08635-7-BLANK2 / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>Eric Wheeler</i>	Eric Wheeler	2704 HV H104	09-24-16	0500
Retrieved from Storage:	<i>Chris Moser</i>	Chris Moser		9/26/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>Chris Moser</i>	Chris Moser	9-26-16	12:00	
Received By:	<i>Dianne Turner</i>	Dianne Turner	9-26-16	12:00	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 09/24/2016		
CACN: 202367		COA: CB20	Survey No.: 16-08636 - Cartridge Testing AW Stack - A Train		
Contact Name: Jones, Parker L		Phone: (509)373-4968		Turnaround: N/A	
Return Report To: Caldwell, Joyce A			MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
5167033386	16-08636-6-BASE-EFF / Hydrar (SKC 226-17-1A) . S167033387 S167033388	Hg-Elemental Source 21			
5167033389	16-08636-6-BASE-IN / Hydrar (SKC 226-17-1A) . S167033390 S167033391	Hg-Elemental Source 22			
5167033392	16-08636-6-BLANK-EFF / Hydrar (SKC 228-17-1A) . S167033393 S167033394	Hg-Elemental Source 23			
5167033395	16-08636-6-BLANK-IN / Hydrar (SKC 226-17-1A) . S167033397 S167033398	Hg-Elemental Source 24			
5167033401	16-08636-6-EFF-A / Hydrar (SKC 226-17-1A) . S167033403 S167033404	Hg-Elemental Source 25			
5167033407	16-08636-6-EFF-B / Hydrar (SKC 226-17-1A) . S167033409 S167033410	Hg-Elemental Source 26			
5167033411	16-08636-6-EFF-C / Hydrar (SKC 226-17-1A) . S167033412 S167033413	Hg-Elemental Source 27			
5167033414	16-08636-6-EFF-D / Hydrar (SKC 226-17-1A) . S167033415 S167033416	Hg-Elemental Source 28			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Joh Wilhelm	270411V/1104	9/25/16	0500
Retrieved from Storage:	<i>[Signature]</i>	Dell Spaulding		9-26-16	0705
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Dell Spaulding	9-26-16	1200	
Received By:	<i>[Signature]</i>	Dianne Turner	9-26-16	12:00	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

Contractor: Washington River Protection Solutions				Date Sampled: 09/24/2016	
CACN: 202367		COA: CB20		Survey No.: 16-08636 - Cartridge Testing AW Stack - A Train	
Contact Name: Jones, Parker L			Phone: (509)373-4966		Turnaround: N/A
Return Report To: Caldwell, Joyce A				MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
SI67033417	16-08636-6-EFF-E / Hydrar (SKC 226-17-1A) • 5167033420 5167033421	Hg-Elemental Source 29			
SI67033423	16-08636-6-EFF-F / Hydrar (SKC 226-17-1A) • 5167033427 5167033428	Hg-Elemental Source 30			
SI67033434	16-08636-6-EFF-G / Hydrar (SKC 226-17-1A) • 5167033436 5167033437	Hg-Elemental Source 31			
SI67033440	16-08636-6-EFF-H / Hydrar (SKC 226-17-1A) • 5167033436 5167033437 5167033438	Hg-Elemental Source 32			
SI67033446	16-08636-6-IN-A / Hydrar (SKC 226-17-1A) • 5167033448 5167033449	Hg-Elemental Source 33			
SI67033452	16-08636-6-IN-B / Hydrar (SKC 226-17-1A) • 5167033454 5167033457	Hg-Elemental Source 34			
SI67033459	16-08636-6-IN-C / Hydrar (SKC 226-17-1A) • 5167033460 5167033461	Hg-Elemental Source 35			
SI67033464	16-08636-6-IN-D / Hydrar (SKC 226-17-1A) • 5167033466 5167033467	Hg-Elemental Source 36			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Joh Wilhelm	2704HV/H104	9/25/16	0500
Retrieved from Storage:	<i>[Signature]</i>	Dell Spaulding		9-26-16	0705
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Dell Spaulding	9-26-16	1200	
Received By:	<i>[Signature]</i>	Dianne Turner	9-26-16	12:00	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 09/24/2016		
CACN: 202367		COA: CB20	Survey No.: 16-08636 - Cartridge Testing AW Stack - A Train		
Contact Name: Jones, Parker L		Phone: (509)373-4966		Turnaround: N/A	
Return Report To: Caldwell, Joyce A			MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
5167033470	16-08636-6-IN-E / Hydrar (SKC 226-17-1A) 5167033472 5167033473	Hg-Elemental Source 37			
5167033476	16-08636-6-IN-F / Hydrar (SKC 226-17-1A) 5167033477 5167033478	Hg-Elemental Source 38			
5167033479	16-08636-6-IN-G / Hydrar (SKC 226-17-1A) 5167033480 5167033488	Hg-Elemental Source 39			
5167033522	16-08636-6-IN-H / Hydrar (SKC 226-17-1A) 5167033523 5167033524	Hg-Elemental Source 40			
<del>16-08636-7-BASE-EFF / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08636-7-BASE-IN / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08636-7-BLANK-EFF / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
<del>16-08636-7-BLANK-IN / CISA (SKC 226-29)</del>		<del>NH3 Source</del>			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Josh Wilhelm	2704 HU/H104	9/25/16	0500
Retrieved from Storage:	<i>[Signature]</i>	Dell Spaulding		9-26-16	0705
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Dell Spaulding	9-26-16	1200	
Received By:	<i>[Signature]</i>	Dianne Turner	9/26/16	12:00	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

**FINAL REPORT ON AMMONIA VAPOR TUBES  
FOR CARTRIDGE EVALUATION  
COLLECTED SEPTEMBER 23 - 24, 2016**

**Document No.: 20162957 Rev. 0**

**Michael A. Purcell**  
WAI Hanford Laboratory

**Date Published**  
October 26, 2016



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 October 26, 2016  
Michael A. Purcell, WHL Project Coordinator

## NARRATIVE

**FINAL REPORT ON AMMONIA VAPOR TUBES  
FOR CARTRIDGE EVALUATION  
COLLECTED SEPTEMBER 23 – 24, 2016**

This final report presents the results of forty ammonia vapor tubes received at the 222-S Laboratory on September 26, 2016, in good condition and with adequate paperwork. The samples were logged into sample delivery group 20162957.

**DISCLAIMERS**

- The information contained in this report is intended only for the use of the addressee and should be considered confidential.
- This report shall not be reproduced, except in full, without written approval of the laboratory.
- The results shown in this report pertain only to the actual samples tested.
- These results conform to the requirements specified in the referenced methods/procedures and specifications provided verbally or electronically by the customer. Any deviations or modifications are discussed in the following narrative.
- This report only addresses laboratory activities related to the listed surveys. Requirements or anomalies concerning field sampling are not addressed in this report.

**PROCEDURES**

Method	Preparation Procedure	Analysis Procedure
Ammonia by OSHA ID-188	LA-533-117, Rev. 3-1	LA-533-117, Rev. 3-1 LA-503-157, Rev. 2-6

**ANALYTICAL SUMMARY**

The vapor tubes were tested for ammonia, as specified on the chain of custody. Standard laboratory procedures for ion chromatography were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory (QAPP)*. Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control samples (LCS). The results of 373 LCS determinations indicate a mean recovery of 98% with a standard deviation of 3.3%. Statistical process control limits for the LCS are 89 - 111% for LA-533-117, instrument IC-9; 80 - 120% for LA-503-157, instrument IC-10; and 88 - 107% for LA-503-157, instrument IC-13, with no significant bias. The overall estimate of uncertainty is 6.7%, with coverage factor (k) = 2.

Due to background levels of ammonium (or interfering compounds) that are typically present in the media used in the sorbent tubes for collecting the vapor samples, positive results are obtained for the preparation blank. Laboratories typically correct the LCS and all field samples for these background levels, when detected. However, per agreement with the customer, no blank



subtraction was performed. The client-requested reporting limit is 10 µg per sample, which makes the analysis of additional blanks and subsequent blank subtraction unnecessary. It is the laboratory's opinion that including the media contribution, which is well below the client's requested reporting limit, provides results that are more conservative than when blank subtractions are performed. Twenty-three of the forty ammonia results for sample group 20162957 were above the reporting limit of 10 µg per sample. For these samples, the total result includes the contribution from the back resin portion even though the back resin portion result is lower than the reporting limit (see Attachment 1).

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Attachment 1

DATA SUMMARY REPORT

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C.300

## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162957

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08635-7-BASE-EFF	Total	S16T033396	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-BASE-EFF	Front Resin	S16T033399	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BASE-EFF	Back Resin	S16T033400	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BASE-IN	Total	S16T033402	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-BASE-IN	Front Resin	S16T033405	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BASE-IN	Back Resin	S16T033406	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BASE-IN	Total	S16T033408	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-BLANK1	Front Resin	S16T033418	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BLANK1	Back Resin	S16T033419	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BLANK2	Total	S16T033422	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-BLANK2	Front Resin	S16T033424	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-BLANK2	Back Resin	S16T033425	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-A	Total	S16T033426	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-A	Front Resin	S16T033429	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-A	Back Resin	S16T033430	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-B	Total	S16T033431	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-B	Front Resin	S16T033432	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-B	Back Resin	S16T033433	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-C	Total	S16T033435	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-C	Front Resin	S16T033438	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-C	Back Resin	S16T033439	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-D	Total	S16T033441	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-D	Front Resin	S16T033444	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-D	Back Resin	S16T033445	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-E	Total	S16T033447	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-E	Front Resin	S16T033450	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-E	Back Resin	S16T033451	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-F	Total	S16T033453	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08635-7-EFF-F	Front Resin	S16T033454	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-F	Back Resin	S16T033455	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08635-7-EFF-G	Total	S16T033458	Ammonia	ug/sample	n/a	<10.0	18.2	10.0
16-08635-7-EFF-G	Front Resin	S16T033462	Ammonia	ug/sample	101	<10.0	17.8	10.0
16-08635-7-EFF-G	Back Resin	S16T033463	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-EFF-H	Total	S16T033465	Ammonia	ug/sample	n/a	<10.0	31.5	10.0
16-08635-7-EFF-H	Front Resin	S16T033468	Ammonia	ug/sample	101	<10.0	30.8	10.0
16-08635-7-EFF-H	Back Resin	S16T033469	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-A	Total	S16T033471	Ammonia	ug/sample	n/a	<10.0	412	100
16-08635-7-IN-A	Front Resin	S16T033474	Ammonia	ug/sample	101	<10.0	412	100
16-08635-7-IN-A	Back Resin	S16T033475	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-B	Total	S16T033765	Ammonia	ug/sample	n/a	<10.0	437	100
16-08635-7-IN-B	Front Resin	S16T033766	Ammonia	ug/sample	101	<10.0	436	100
16-08635-7-IN-B	Back Resin	S16T033767	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-C	Total	S16T033768	Ammonia	ug/sample	n/a	<10.0	419	100
16-08635-7-IN-C	Front Resin	S16T033769	Ammonia	ug/sample	101	<10.0	418	100
16-08635-7-IN-C	Back Resin	S16T033770	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-D	Total	S16T033771	Ammonia	ug/sample	n/a	<10.0	413	100
16-08635-7-IN-D	Front Resin	S16T033772	Ammonia	ug/sample	101	<10.0	411	100
16-08635-7-IN-D	Back Resin	S16T033773	Ammonia	ug/sample	101	<10.0	<10.0	10.0

## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162957

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08635-7-IN-E	Total	S16T033774	Ammonia	ug/sample	n/a	<10.0	388	100
16-08635-7-IN-E	Front Resin	S16T033775	Ammonia	ug/sample	101	<10.0	387	100
16-08635-7-IN-E	Back Resin	S16T033776	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-F	Total	S16T033777	Ammonia	ug/sample	n/a	<10.0	176	50.0
16-08635-7-IN-F	Front Resin	S16T033778	Ammonia	ug/sample	101	<10.0	176	50.0
16-08635-7-IN-F	Back Resin	S16T033779	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-G	Total	S16T033780	Ammonia	ug/sample	n/a	<10.0	446	100
16-08635-7-IN-G	Front Resin	S16T033781	Ammonia	ug/sample	101	<10.0	446	100
16-08635-7-IN-G	Back Resin	S16T033782	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08635-7-IN-H	Total	S16T033783	Ammonia	ug/sample	n/a	<10.0	430	100
16-08635-7-IN-H	Front Resin	S16T033784	Ammonia	ug/sample	102	<10.0	429	100
16-08635-7-IN-H	Back Resin	S16T033785	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BASE-EFF	Total	S16T033786	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-BASE-EFF	Front Resin	S16T033787	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BASE-EFF	Back Resin	S16T033788	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BASE-IN	Total	S16T033789	Ammonia	ug/sample	n/a	<10.0	15.7	10.0
16-08636-7-BASE-IN	Front Resin	S16T033790	Ammonia	ug/sample	102	<10.0	15.2	10.0
16-08636-7-BASE-IN	Back Resin	S16T033791	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BLANK-EFF	Total	S16T033792	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-BLANK-EFF	Front Resin	S16T033793	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BLANK-EFF	Back Resin	S16T033794	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BLANK-IN	Total	S16T033795	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-BLANK-IN	Front Resin	S16T033796	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-BLANK-IN	Back Resin	S16T033797	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-A	Total	S16T033798	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-EFF-A	Front Resin	S16T033809	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-A	Back Resin	S16T033810	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-B	Total	S16T033811	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-EFF-B	Front Resin	S16T033812	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-B	Back Resin	S16T033813	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-C	Total	S16T033814	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-EFF-C	Front Resin	S16T033815	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-C	Back Resin	S16T033816	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-D	Total	S16T033817	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08636-7-EFF-D	Front Resin	S16T033818	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-D	Back Resin	S16T033819	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-E	Total	S16T033820	Ammonia	ug/sample	n/a	<10.0	14.1	10.0
16-08636-7-EFF-E	Front Resin	S16T033821	Ammonia	ug/sample	102	<10.0	13.5	10.0
16-08636-7-EFF-E	Back Resin	S16T033822	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-EFF-F	Total	S16T033823	Ammonia	ug/sample	n/a	<10.0	25.0	10.0
16-08636-7-EFF-F	Front Resin	S16T033824	Ammonia	ug/sample	104	<10.0	24.1	10.0
16-08636-7-EFF-F	Back Resin	S16T033825	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-EFF-G	Total	S16T033826	Ammonia	ug/sample	n/a	<10.0	39.9	10.0
16-08636-7-EFF-G	Front Resin	S16T033827	Ammonia	ug/sample	104	<10.0	39.4	10.0
16-08636-7-EFF-G	Back Resin	S16T033828	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-EFF-H	Total	S16T033829	Ammonia	ug/sample	n/a	<10.0	66.9	10.0
16-08636-7-EFF-H	Front Resin	S16T033830	Ammonia	ug/sample	104	<10.0	66.4	10.0
16-08636-7-EFF-H	Back Resin	S16T033831	Ammonia	ug/sample	104	<10.0	<10.0	10.0

## DATA SUMMARY REPORT FOR SAMPLE GROUP 20162957

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08636-7-IN-A	Total	S16T033832	Ammonia	ug/sample	n/a	<10.0	409	100
16-08636-7-IN-A	Front Resin	S16T033833	Ammonia	ug/sample	104	<10.0	408	100
16-08636-7-IN-A	Back Resin	S16T033834	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-B	Total	S16T033835	Ammonia	ug/sample	n/a	<10.0	438	100
16-08636-7-IN-B	Front Resin	S16T033836	Ammonia	ug/sample	104	<10.0	437	100
16-08636-7-IN-B	Back Resin	S16T033837	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-C	Total	S16T033838	Ammonia	ug/sample	n/a	<10.0	475	100
16-08636-7-IN-C	Front Resin	S16T033839	Ammonia	ug/sample	104	<10.0	474	100
16-08636-7-IN-C	Back Resin	S16T033840	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-D	Total	S16T033841	Ammonia	ug/sample	n/a	<10.0	393	100
16-08636-7-IN-D	Front Resin	S16T033842	Ammonia	ug/sample	104	<10.0	392	100
16-08636-7-IN-D	Back Resin	S16T033843	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-E	Total	S16T033844	Ammonia	ug/sample	n/a	<10.0	411	100
16-08636-7-IN-E	Front Resin	S16T033845	Ammonia	ug/sample	104	<10.0	410	100
16-08636-7-IN-E	Back Resin	S16T033846	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-F	Total	S16T033847	Ammonia	ug/sample	n/a	<10.0	229	100
16-08636-7-IN-F	Front Resin	S16T033848	Ammonia	ug/sample	104	<10.0	229	100
16-08636-7-IN-F	Back Resin	S16T033849	Ammonia	ug/sample	104	<10.0	<10.0	10.0
16-08636-7-IN-G	Total	S16T033850	Ammonia	ug/sample	n/a	<10.0	367	100
16-08636-7-IN-G	Front Resin	S16T033851	Ammonia	ug/sample	102	<10.0	366	100
16-08636-7-IN-G	Back Resin	S16T033852	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08636-7-IN-H	Total	S16T033853	Ammonia	ug/sample	n/a	<10.0	401	100
16-08636-7-IN-H	Front Resin	S16T033854	Ammonia	ug/sample	102	<10.0	401	100
16-08636-7-IN-H	Back Resin	S16T033855	Ammonia	ug/sample	102	<10.0	<10.0	10.0

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Attachment 2

ANALYSIS DATE REPORT

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## ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162957

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T033399	16-08635-7-BASE-EFF	Ammoria	10/03/2016 13:40	10/03/2016 16:38
S16T033400	16-08635-7-BASE-EFF	Ammoria	10/03/2016 13:40	10/03/2016 16:56
S16T033405	16-08635-7-BASE-IN	Ammoria	10/03/2016 13:40	10/03/2016 17:14
S16T033406	16-08635-7-BASE-IN	Ammoria	10/03/2016 13:40	10/03/2016 17:32
S16T033418	16-08635-7-BLANK1	Ammoria	10/03/2016 13:40	10/03/2016 17:50
S16T033419	16-08635-7-BLANK1	Ammoria	10/03/2016 13:40	10/03/2016 18:08
S16T033424	16-08635-7-BLANK2	Ammoria	10/03/2016 13:40	10/03/2016 19:21
S16T033425	16-08635-7-BLANK2	Ammoria	10/03/2016 13:40	10/03/2016 19:39
S16T033429	16-08635-7-EFF-A	Ammoria	10/03/2016 13:40	10/03/2016 19:57
S16T033430	16-08635-7-EFF-A	Ammoria	10/03/2016 13:40	10/03/2016 20:15
S16T033432	16-08635-7-EFF-B	Ammoria	10/03/2016 13:40	10/03/2016 20:33
S16T033433	16-08635-7-EFF-B	Ammoria	10/03/2016 13:40	10/03/2016 20:51
S16T033438	16-08635-7-EFF-C	Ammoria	10/03/2016 13:40	10/03/2016 21:09
S16T033439	16-08635-7-EFF-C	Ammoria	10/03/2016 13:40	10/03/2016 21:27
S16T033444	16-08635-7-EFF-D	Ammoria	10/03/2016 13:40	10/03/2016 21:45
S16T033445	16-08635-7-EFF-D	Ammoria	10/03/2016 13:40	10/03/2016 22:03
S16T033450	16-08635-7-EFF-E	Ammoria	10/03/2016 13:40	10/03/2016 23:16
S16T033451	16-08635-7-EFF-E	Ammoria	10/03/2016 13:40	10/03/2016 23:34
S16T033454	16-08635-7-EFF-F	Ammoria	10/03/2016 13:40	10/03/2016 23:52
S16T033455	16-08635-7-EFF-F	Ammoria	10/03/2016 13:40	10/04/2016 00:10
S16T033462	16-08635-7-EFF-G	Ammoria	10/03/2016 13:40	10/04/2016 02:35
S16T033463	16-08635-7-EFF-G	Ammoria	10/03/2016 13:40	10/04/2016 02:53
S16T033468	16-08635-7-EFF-H	Ammoria	10/03/2016 13:40	10/04/2016 03:11
S16T033469	16-08635-7-EFF-H	Ammoria	10/03/2016 13:40	10/04/2016 03:29
S16T033474	16-08635-7-IN-A	Ammoria	10/03/2016 13:40	10/04/2016 09:49
S16T033475	16-08635-7-IN-A	Ammoria	10/03/2016 13:40	10/04/2016 04:05
S16T033766	16-08635-7-IN-B	Ammoria	10/03/2016 13:40	10/04/2016 10:07
S16T033767	16-08635-7-IN-B	Ammoria	10/03/2016 13:40	10/04/2016 05:36
S16T033769	16-08635-7-IN-C	Ammoria	10/03/2016 13:40	10/04/2016 10:25
S16T033770	16-08635-7-IN-C	Ammoria	10/03/2016 13:40	10/04/2016 06:12
S16T033772	16-08635-7-IN-D	Ammoria	10/03/2016 13:40	10/04/2016 10:43
S16T033773	16-08635-7-IN-D	Ammoria	10/03/2016 13:40	10/04/2016 06:48
S16T033775	16-08635-7-IN-E	Ammoria	10/03/2016 13:40	10/04/2016 11:01
S16T033776	16-08635-7-IN-E	Ammoria	10/03/2016 13:40	10/04/2016 07:24
S16T033778	16-08635-7-IN-F	Ammoria	10/03/2016 13:40	10/04/2016 11:19
S16T033779	16-08635-7-IN-F	Ammoria	10/03/2016 13:40	10/04/2016 08:00
S16T033781	16-08635-7-IN-G	Ammoria	10/03/2016 13:40	10/04/2016 11:37
S16T033782	16-08635-7-IN-G	Ammoria	10/03/2016 13:40	10/04/2016 09:31
S16T033784	16-08635-7-IN-H	Ammoria	10/11/2016 16:55	10/17/2016 12:14
S16T033785	16-08635-7-IN-H	Ammoria	10/11/2016 16:55	10/14/2016 17:00
S16T033787	16-08636-7-BASE-EFF	Ammoria	10/11/2016 16:55	10/14/2016 17:17
S16T033788	16-08636-7-BASE-EFF	Ammoria	10/11/2016 16:55	10/14/2016 17:34
S16T033790	16-08636-7-BASE-IN	Ammoria	10/11/2016 16:55	10/14/2016 17:51
S16T033791	16-08636-7-BASE-IN	Ammoria	10/11/2016 16:55	10/14/2016 18:08
S16T033793	16-08636-7-BLANK-EFF	Ammoria	10/11/2016 16:55	10/14/2016 19:15
S16T033794	16-08636-7-BLANK-EFF	Ammoria	10/11/2016 16:55	10/14/2016 19:32

## ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162957

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T033796	16-08636-7-BLANK-IN	Ammoria	10/11/2016 16:55	10/14/2016 19:49
S16T033797	16-08636-7-BLANK-IN	Ammoria	10/11/2016 16:55	10/14/2016 20:06
S16T033809	16-08636-7-EFF-A	Ammoria	10/11/2016 16:55	10/14/2016 20:23
S16T033810	16-08636-7-EFF-A	Ammoria	10/11/2016 16:55	10/14/2016 20:40
S16T033812	16-08636-7-EFF-B	Ammoria	10/11/2016 16:55	10/14/2016 20:57
S16T033813	16-08636-7-EFF-B	Ammoria	10/11/2016 16:55	10/14/2016 21:14
S16T033815	16-08636-7-EFF-C	Ammoria	10/11/2016 16:55	10/14/2016 21:30
S16T033816	16-08636-7-EFF-C	Ammoria	10/11/2016 16:55	10/14/2016 21:47
S16T033818	16-08636-7-EFF-D	Ammoria	10/11/2016 16:55	10/14/2016 22:55
S16T033819	16-08636-7-EFF-D	Ammoria	10/11/2016 16:55	10/14/2016 23:12
S16T033821	16-08636-7-EFF-E	Ammoria	10/11/2016 16:55	10/14/2016 23:29
S16T033822	16-08636-7-EFF-E	Ammoria	10/11/2016 16:55	10/14/2016 23:46
S16T033824	16-08636-7-EFF-F	Ammoria	10/11/2016 16:55	10/15/2016 02:01
S16T033825	16-08636-7-EFF-F	Ammoria	10/11/2016 16:55	10/15/2016 02:17
S16T033827	16-08636-7-EFF-G	Ammoria	10/11/2016 16:55	10/15/2016 02:34
S16T033828	16-08636-7-EFF-G	Ammoria	10/11/2016 16:55	10/15/2016 02:51
S16T033830	16-08636-7-EFF-H	Ammoria	10/11/2016 16:55	10/15/2016 03:08
S16T033831	16-08636-7-EFF-H	Ammoria	10/11/2016 16:55	10/15/2016 03:25
S16T033833	16-08636-7-IN-A	Ammoria	10/11/2016 16:55	10/17/2016 12:31
S16T033834	16-08636-7-IN-A	Ammoria	10/11/2016 16:55	10/15/2016 04:49
S16T033836	16-08636-7-IN-B	Ammoria	10/11/2016 16:55	10/17/2016 12:48
S16T033837	16-08636-7-IN-B	Ammoria	10/11/2016 16:55	10/15/2016 05:23
S16T033839	16-08636-7-IN-C	Ammoria	10/11/2016 16:55	10/17/2016 13:05
S16T033840	16-08636-7-IN-C	Ammoria	10/11/2016 16:55	10/15/2016 05:57
S16T033842	16-08636-7-IN-D	Ammoria	10/11/2016 16:55	10/17/2016 13:22
S16T033843	16-08636-7-IN-D	Ammoria	10/11/2016 16:55	10/15/2016 06:31
S16T033845	16-08636-7-IN-E	Ammoria	10/11/2016 16:55	10/17/2016 13:38
S16T033846	16-08636-7-IN-E	Ammoria	10/11/2016 16:55	10/15/2016 07:04
S16T033848	16-08636-7-IN-F	Ammoria	10/11/2016 16:55	10/17/2016 13:55
S16T033849	16-08636-7-IN-F	Ammoria	10/11/2016 16:55	10/15/2016 08:29
S16T033851	16-08636-7-IN-G	Ammoria	10/06/2016 17:00	10/10/2016 11:33
S16T033852	16-08636-7-IN-G	Ammoria	10/06/2016 17:00	10/06/2016 23:28
S16T033854	16-08636-7-IN-H	Ammoria	10/06/2016 17:00	10/10/2016 11:57
S16T033855	16-08636-7-IN-H	Ammoria	10/06/2016 17:00	10/07/2016 00:14



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Attachment 3

RECEIPT PAPERWORK

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*Cartridge Testing & Cartridge Testing NW*

222-S	<b>SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST</b>			ATS-LO-090-101 Rev DG-1
Date Samples Received: <u>9-26-16</u> Total Number of Samples: <u>480</u> Group #: <u>20162957-NH3</u>				
Sample Custodian: <u>Dianne Turner</u> IH Technician: <u>Paul Spaulding 9-26-16</u>				
Sample Custodian to Complete:				
Action	Yes	No	N/A	Comments
RSR provided?			✓	
Verify GKI is complete			✓	<input type="checkbox"/> In Project File
Received from an alpha facility?		✓		<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present			✓	
Record cooler temperature in centigrade, as appropriate	<u>40</u> <u>6C</u>			<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	✓			If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	✓			
• Date and time of sampling	✓			
• Sampling location or origin	✓			
• Container type, size, and number	✓			
• Preservatives (if used) noted on the COC/RSA and sample bottles			✓	
• Analysis request is clear	✓			
• Signature of persons relinquishing and receiving samples	✓			
• Date and/or time of sample custody exchange	✓			
Verify that sample numbers on containers match the COC and/or RSA	✓			
Samples stored properly (e.g., refrigeration)	✓			
Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.				
Samples acceptable for release? <u>yes</u> PC/SC Initials <u>dlr</u> Date <u>9/26/16</u>				
If No, comment on communication and resolution:				
WRPS SHP-280 Run-120 WHL Run-(80) 40NH <sub>3</sub> 40 Hg Acetnrite 40				
<b>Number of IH Samples Received:</b>				
Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe: _____	1,3-Butadiene: <u>80</u>
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVOA: <u>40</u>	VOA: <u>40</u>	Other-IH: _____

SWIHD - Chain of Custody

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

Contractor: Washington River Protection Solutions		Date Sampled: 09/23/2016			
CACN: 202387	COA: CB20	Survey No.: 16-08635 - Cartridge Testing			
Contact Name: Jones, Parker L		Phone: (509)373-4966	Turnaround: N/A		
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737		
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
<del> </del>	<del>16-08635-6-IN-E / Hydrar (SKC 226-17-1A)</del>	<del>Hg-Elemental Source</del>			
<del> </del>	<del>16-08635-6-IN-F / Hydrar (SKC 226-17-1A)</del>	<del>Hg-Elemental Source</del>			
<del> </del>	<del>16-08635-6-IN-G / Hydrar (SKC 226-17-1A)</del>	<del>Hg-Elemental Source</del>			
<del> </del>	<del>16-08635-6-IN-H / Hydrar (SKC 226-17-1A)</del>	<del>Hg-Elemental Source</del>			
516T033376	16-08635-7-BASE-EFF / CISA (SKC 226-29) 516T033399 33400	NH3 Source			
516T033402	16-08635-7-BASE-IN / CISA (SKC 226-29) 516T033405 33406	NH3 Source			
516T033408	16-08635-7-BLANK1 / CISA (SKC 226-29) 516T033418 33419	NH3 Source			
516T033422	16-08635-7-BLANK2 / CISA (SKC 226-29) 516T033424 33425	NH3 Source			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:		Josh Wilhelm	2701HV / H104	9/24/16	0455
Retrieved from Storage:		Christemoo		9/26/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:		Christemoo	9-26-16	1200	
Received By:		TERESA FORRESTER	9-26-16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					







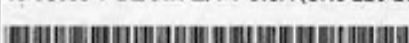


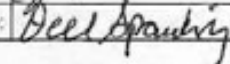
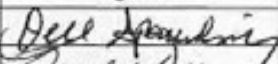
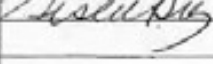
INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 09/23/2016		
CACN: 202367		COA: CB20		Survey No.: 16-08635 - Cartridge Testing	
Contact Name: Jones, Parker L.			Phone: (509)373-4966		Turnaround: N/A
Return Report To: Caldwell, Joyce A.			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description		Required Analysis		
516T033426	16-08635-7-EFF-A / CISA (SKC 226-29) 16-08635-7-EFF-A / CISA (SKC 226-29)	516T033429 33430	NH3 Source		
516T033431	16-08635-7-EFF-B / CISA (SKC 226-29) 16-08635-7-EFF-B / CISA (SKC 226-29)	516T033432 33433	NH3 Source		
516T033435	16-08635-7-EFF-C / CISA (SKC 226-29) 16-08635-7-EFF-C / CISA (SKC 226-29)	516T033438 33439	NH3 Source		
516T033441	16-08635-7-EFF-D / CISA (SKC 226-29) 16-08635-7-EFF-D / CISA (SKC 226-29)	516T033444 33445	NH3 Source		
516T033447	16-08635-7-EFF-E / CISA (SKC 226-29) 16-08635-7-EFF-E / CISA (SKC 226-29)	516T033450 33451	NH3 Source		
516T033453	16-08635-7-EFF-F / CISA (SKC 226-29) 16-08635-7-EFF-F / CISA (SKC 226-29)	516T033454 33455	NH3 Source		
516T033458	16-08635-7-EFF-G / CISA (SKC 226-29) 16-08635-7-EFF-G / CISA (SKC 226-29)	516T033462 33463	NH3 Source		
516T033465	16-08635-7-EFF-H / CISA (SKC 226-29) 16-08635-7-EFF-H / CISA (SKC 226-29)	516T033468 33469	NH3 Source		
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Josh Wilhelm	2704 HW/H10Y	9/24/2016	0755
Retrieved from Storage:	<i>[Signature]</i>	Chastemore		9/26/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Chastemore	9-26-16	1200	
Received By:	<i>[Signature]</i>	TERESA FORRESTER	9-26-16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

<b>Contractor:</b> Washington River Protection Solutions			<b>Date Sampled:</b> 09/23/2016		
<b>CACN:</b> 202367		<b>COA:</b> CB20		<b>Survey No.:</b> 16-08635 - Cartridge Testing	
<b>Contact Name:</b> Jones, Parker L.			<b>Phone:</b> (509)373-4986		<b>Turnaround:</b> N/A
<b>Return Report To:</b> Caldwell, Joyce A.			<b>MSIN:</b> R1-06		<b>Phone:</b> (509)376-0737
Laboratory Log No.	Sample ID/Type/Description			Required Analysis	
516T033471	16-08635-7-IN-A / CISA (SKC 226-29) [Barcode]	516T033474 33475		NH3 Source	
516T033765	16-08635-7-IN-B / CISA (SKC 226-29) [Barcode]	516T033766 33767		NH3 Source	
516T033768	16-08635-7-IN-C / CISA (SKC 226-29) [Barcode]	516T033769 33770		NH3 Source	
516T033771	16-08635-7-IN-D / CISA (SKC 226-29) [Barcode]	516T033772 33773		NH3 Source	
516T033774	16-08635-7-IN-E / CISA (SKC 226-29) [Barcode]	516T033775 33776		NH3 Source	
516T033777	16-08635-7-IN-F / CISA (SKC 226-29) [Barcode]	516T033778 33779		NH3 Source	
516T033780	16-08635-7-IN-G / CISA (SKC 226-29) [Barcode]	516T033781 33782		NH3 Source	
516T033783	16-08635-7-IN-H / CISA (SKC 226-29) [Barcode]	516T033784 33785		NH3 Source	
<b>Special Instructions:</b> N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	[Signature]	Josh Wilhelm	2704 HV/H104	9/24/16	0455
Retrieved from Storage:	[Signature]	Christi Moaw		9/26/16	0745
	Signature	Printed Name	Date	Time	
Relinquished By:	[Signature]	Christi Moaw	9-26-16	1200	
Received By:	Teresa Forrester	TERESA FORRESTER	9-26-16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
<b>Additional Comments:</b>					

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

<b>Contractor:</b> Washington River Protection Solutions			<b>Date Sampled:</b> 09/24/2016		
<b>CACN:</b> 202367		<b>COA:</b> CB20		<b>Survey No.:</b> 16-08636 - Cartridge Testing AW Stack - A Train	
<b>Contact Name:</b> Jones, Parker L			<b>Phone:</b> (509)373-4866		<b>Turnaround:</b> N/A
<b>Return Report To:</b> Caldwell, Joyce A			<b>MSIN:</b> R1-06		<b>Phone:</b> (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
	16-08636-6-IN-E / Hydrar (SKC 226-17-1A) 	Hg-Elemental Source			
	16-08636-6-IN-F / Hydrar (SKC 226-17-1A) 	Hg-Elemental Source			
	16-08636-6-IN-G / Hydrar (SKC 226-17-1A) 	Hg-Elemental Source			
	16-08636-6-IN-H / Hydrar (SKC 226-17-1A) 	Hg-Elemental Source			
	16-08636-7-BASE-EFF / CISA (SKC 226-29) 	S16T033787 33788	NH3 Source		
	16-08636-7-BASE-IN / CISA (SKC 226-29) 	S16T033790 33791	NH3 Source		
	16-08636-7-BLANK-EFF / CISA (SKC 226-29) 	S16T033793 33794	NH3 Source		
	16-08636-7-BLANK-IN / CISA (SKC 226-29) 	S16T033796 33797	NH3 Source		
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:		Josh Witham	2704 HW/H104	9/25/16	0500
Retrieved from Storage:		Dell Spaulding		9-26-16	0715
	Signature	Printed Name	Date	Time	
Relinquished By:		Dell Spaulding	9-26-16	1200	
Received By:		Lester Diaz	9/26/16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

**INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST**

Contractor: Washington River Protection Solutions			Date Sampled: 09/24/2016		
CAGN: 202367		COA: CB20	Survey No.: 16-08636 - Cartridge Testing AW Stack - A Train		
Contact Name: Jones, Parker L		Phone: (509)373-4866	Turnaround: N/A		
Return Report To: Caldwell, Joyce A			MSIN: R1-06	Phone: (509)378-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
S16T033798	16-08636-7-EFF-A / CISA (SKC 226-29) S16T033809 33810	NH3 Source			
S16T033811	16-08636-7-EFF-B / CISA (SKC 226-29) S16T033812 33813	NH3 Source			
S16T033814	16-08636-7-EFF-C / CISA (SKC 226-29) S16T033815 33816	NH3 Source			
S16T033817	16-08636-7-EFF-D / CISA (SKC 226-29) S16T033818 33819	NH3 Source			
S16T033820	16-08636-7-EFF-E / CISA (SKC 226-29) S16T033821 33822	NH3 Source			
S16T033823	16-08636-7-EFF-F / CISA (SKC 226-29) S16T033824 33825	NH3 Source			
S16T033826	16-08636-7-EFF-G / CISA (SKC 226-29) S16T033827 33828	NH3 Source			
S16T033829	16-08636-7-EFF-H / CISA (SKC 226-29) S16T033830 33831	NH3 Source			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Josh Wilhelm	2704 HV/H104	9/29/16	0500
Retrieved from Storage:	<i>[Signature]</i>	Dell Spaulding		9-26-16	0715
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Dell Spaulding	9-26-16	1200	
Received By:	<i>[Signature]</i>	Leslie Metz	9/26/16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions			Date Sampled: 09/24/2016		
CACN: 202967		COA: CB20		Survey No.: 16-08636 - Cartridge Testing AW Stack - A Train	
Contact Name: Jones, Parker L			Phone: (509)373-4966		Turnaround: N/A
Return Report To: Caldwell, Joyce A			MSIN: R1-06		Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis			
S16T033832	16-08636-7-IN-A / CISA (SKC 226-29) S16T033833 33834	NH3 Source			
S16T033835	16-08636-7-IN-B / CISA (SKC 226-29) S16T033836 33837	NH3 Source			
S16T033838	16-08636-7-IN-C / CISA (SKC 226-29) S16T033839 33840	NH3 Source			
S16T033841	16-08636-7-IN-D / CISA (SKC 226-29) S16T033842 33843	NH3 Source			
S16T033844 S16T033844 du 9/27/16	16-08636-7-IN-E / CISA (SKC 226-29) S16T033845 33846	NH3 Source			
S16T033847	16-08636-7-IN-F / CISA (SKC 226-29) S16T033848 33849	NH3 Source			
S16T033850	16-08636-7-IN-G / CISA (SKC 226-29) S16T033851 33852	NH3 Source			
S16T033853	16-08636-7-IN-H / CISA (SKC 226-29) S16T033854 33855	NH3 Source			
Special Instructions: N/A					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Josh Wilhelm	2704HV/H104	9/25/16	0500
Retrieved from Storage:	<i>[Signature]</i>	Dell Spaulding		9-26-16	0715
	Signature	Printed Name	Date	Time	
Relinquished By:	<i>[Signature]</i>	Dell Spaulding	9-26-16	1200	
Received By:	<i>[Signature]</i>	Leslie Diaz	9/26/16	1200	
Relinquished By:					
Received By:					
Relinquished By:					
Received By:					
Additional Comments:					





# ANALYTICAL REPORT

Report Date: October 06, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert\_w\_sosa@rl.gov

20162971

Workorder: **34-1627297**

Client Project ID: Washington River Protection  
So

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>\$16T033605</b>		Collected: 09/23/2016		
Lab ID: 1627297001		Received: 09/28/2016		
Method: <b>EPA TO-11A</b>		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	<b>0.48</b>	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: <b>\$16T033606</b>		Collected: 09/23/2016		
Lab ID: 1627297002		Received: 09/28/2016		
Method: <b>EPA TO-11A</b>		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<b>0.071</b>	NA	NA	0.050
Acetaldehyde	<b>0.085</b>	NA	NA	0.050

Results Continued on Next Page

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ANALYTICAL REPORT

Workorder: 34-1627297
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Acetone, Acrolein, Propionaldehyde, Crotonaldehyde, Butyraldehyde, Benzaldehyde, Isovaleraldehyde, Valeraldehyde, m-Tolualdehyde, p-Tolualdehyde, o-Tolualdehyde, Hexanal, and 2,5-Dimethylbenzaldehyde.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Formaldehyde, Acetaldehyde, Acetone, Acrolein, Propionaldehyde, Crotonaldehyde, Butyraldehyde, Benzaldehyde, Isovaleraldehyde, Valeraldehyde, m-Tolualdehyde, p-Tolualdehyde, o-Tolualdehyde, Hexanal, and 2,5-Dimethylbenzaldehyde.



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033608		Collected: 09/23/2016		
Lab ID: 1627297004		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.15	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033609		Collected: 09/23/2016		
Lab ID: 1627297005		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.28	NA	NA	0.050
Acetone	0.068	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033609		Collected: 09/23/2016		
Lab ID: 1627297005		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033610		Collected: 09/23/2016		
Lab ID: 1627297006		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.42	NA	NA	0.050
Acetone	0.061	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033611		Collected: 09/23/2016		
Lab ID: 1627297007		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.40	NA	NA	0.050
Acetone	0.31	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: 34-1627297
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Acrolein, Propionaldehyde, Crotonaldehyde, Butyraldehyde, Benzaldehyde, Isovaleraldehyde, Valeraldehyde, m-Tolualdehyde, p-Tolualdehyde, o-Tolualdehyde, Hexanal, and 2,5-Dimethylbenzaldehyde.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Rows include Formaldehyde, Acetaldehyde, Acetone, Acrolein, Propionaldehyde, Crotonaldehyde, Butyraldehyde, Benzaldehyde, Isovaleraldehyde, Valeraldehyde, m-Tolualdehyde, p-Tolualdehyde, o-Tolualdehyde, Hexanal, and 2,5-Dimethylbenzaldehyde.



### ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033613		Collected: 09/23/2016		
Lab ID: 1627297009		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.42	NA	NA	0.050
Acetone	0.12	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033614		Collected: 09/23/2016		
Lab ID: 1627297010		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.42	NA	NA	0.050
Acetone	0.35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033614		Collected: 09/23/2016		
Lab ID: 1627297010		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033615		Collected: 09/23/2016		
Lab ID: 1627297011		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.45	NA	NA	0.050
Acetone	0.48	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033616		Collected: 09/23/2016		
Lab ID: 1627297012		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.41	NA	NA	0.050
Acetone	0.70	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033616		Collected: 09/23/2016		
Lab ID: 1627297012		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033617		Collected: 09/23/2016		
Lab ID: 1627297013		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.20	NA	NA	0.050
Acetaldehyde	0.73	NA	NA	0.050
Acetone	3.2	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.20	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.26	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.052	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.17	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050





### ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033618		Collected: 09/23/2016		
Lab ID: 1627297014		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.054	NA	NA	0.050
Acetaldehyde	0.73	NA	NA	0.050
Acetone	4.7	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.21	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.26	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.080	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.11	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033619		Collected: 09/23/2016		
Lab ID: 1627297015		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.67	NA	NA	0.050
Acetone	4.7	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.19	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.27	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033619		Collected: 09/23/2016		
Lab ID: 1627297015		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	0.14	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033620		Collected: 09/23/2016		
Lab ID: 1627297016		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.059	NA	NA	0.050
Acetaldehyde	0.66	NA	NA	0.050
Acetone	3.9	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.16	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.22	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.060	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.10	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033621		Collected: 09/23/2016		
Lab ID: 1627297017		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.090	NA	NA	0.050
Acetaldehyde	0.66	NA	NA	0.050
Acetone	3.4	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033621	Collected: 09/23/2016			
Lab ID: 1627297017	Received: 09/28/2016			
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/03/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.20	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.23	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.070	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.12	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033622	Collected: 09/23/2016			
Lab ID: 1627297018	Received: 09/28/2016			
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/03/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.086	NA	NA	0.050
Acetaldehyde	0.65	NA	NA	0.050
Acetone	3.5	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.24	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.052	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.10	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033623		Collected: 09/23/2016		
Lab ID: 1627297019		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.064	NA	NA	0.050
Acetaldehyde	0.66	NA	NA	0.050
Acetone	3.6	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.21	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.091	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033624		Collected: 09/23/2016		
Lab ID: 1627297020		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.67	NA	NA	0.050
Acetone	3.5	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.20	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.25	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033624		Collected: 09/23/2016		
Lab ID: 1627297020		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	0.078	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033625		Collected: 09/24/2016		
Lab ID: 1627297021		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.059	NA	NA	0.050
Acetaldehyde	0.053	NA	NA	0.050
Acetone	0.43	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033626		Collected: 09/24/2016		
Lab ID: 1627297022		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.080	NA	NA	0.050
Acetaldehyde	0.10	NA	NA	0.050
Acetone	0.49	NA	NA	0.050

Results Continued on Next Page



**ANALYTICAL REPORT**

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033626		Collected: 09/24/2016		
Lab ID: 1627297022		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033627		Collected: 09/24/2016		
Lab ID: 1627297023		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.49	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033628		Collected: 09/24/2016		
Lab ID: 1627297024		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033629		Collected: 09/24/2016		
Lab ID: 1627297025		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.057	NA	NA	0.050
Acetaldehyde	0.34	NA	NA	0.050
Acetone	0.18	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033629		Collected: 09/24/2016		
Lab ID: 1627297025		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033630		Collected: 09/24/2016		
Lab ID: 1627297026		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033631		Collected: 09/24/2016		
Lab ID: 1627297027		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.47	NA	NA	0.050
Acetone	0.23	NA	NA	0.050

Results Continued on Next Page





ANALYTICAL REPORT

Workorder: 34-1627297
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Includes sample ID S16T033631 and various aldehyde analytes.

Table with 5 columns: Analyte, Result (ug/sample), Result (mg/m³), Result (ppm), RL (ug/sample). Includes sample ID S16T033632 and various aldehyde analytes.



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033633		Collected: 09/24/2016		
Lab ID: 1627297029		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.081	NA	NA	0.050
Acetaldehyde	0.49	NA	NA	0.050
Acetone	0.71	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033634		Collected: 09/24/2016		
Lab ID: 1627297030		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.47	NA	NA	0.050
Acetone	0.65	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033634		Collected: 09/24/2016		
Lab ID: 1627297030		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033635		Collected: 09/24/2016		
Lab ID: 1627297031		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.45	NA	NA	0.050
Acetone	0.94	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033636		Collected: 09/24/2016		
Lab ID: 1627297032		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.43	NA	NA	0.050
Acetone	1.3	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033636		Collected: 09/24/2016		
Lab ID: 1627297032		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033637		Collected: 09/24/2016		
Lab ID: 1627297033		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.23	NA	NA	0.050
Acetaldehyde	0.71	NA	NA	0.050
Acetone	1.8	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.16	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.24	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.058	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.17	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033638		Collected: 09/24/2016		
Lab ID: 1627297034		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.073	NA	NA	0.050
Acetaldehyde	0.67	NA	NA	0.050
Acetone	3.9	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.18	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.29	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.17	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033639		Collected: 09/24/2016		
Lab ID: 1627297035		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.74	NA	NA	0.050
Acetone	5.1	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.21	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.27	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033639		Collected: 09/24/2016		
Lab ID: 1627297035		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	0.14	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033640		Collected: 09/24/2016		
Lab ID: 1627297036		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.061	NA	NA	0.050
Acetaldehyde	0.63	NA	NA	0.050
Acetone	4.1	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.23	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.11	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033641		Collected: 09/24/2016		
Lab ID: 1627297037		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.088	NA	NA	0.050
Acetaldehyde	0.63	NA	NA	0.050
Acetone	3.2	NA	NA	0.050

Results Continued on Next Page



## ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### Analytical Results

Sample ID: S16T033641		Collected: 09/24/2016		
Lab ID: 1627297037		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.24	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033642		Collected: 09/24/2016		
Lab ID: 1627297038		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.084	NA	NA	0.050
Acetaldehyde	0.60	NA	NA	0.050
Acetone	3.0	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.22	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



# ANALYTICAL REPORT

Workorder: **34-1627297**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033643	Collected: 09/24/2016			
Lab ID: 1627297039	Received: 09/28/2016			
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/03/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.074	NA	NA	0.050
Acetaldehyde	0.52	NA	NA	0.050
Acetone	3.1	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.17	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.24	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T033644	Collected: 09/24/2016			
Lab ID: 1627297040	Received: 09/28/2016			
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)	Analyzed: 10/03/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Formaldehyde	0.078	NA	NA	0.050
Acetaldehyde	0.63	NA	NA	0.050
Acetone	2.8	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.16	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.20	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050

Results Continued on Next Page





# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033644		Collected: 09/24/2016		
Lab ID: 1627297040		Received: 09/28/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/03/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

## Comments

<p>Quality Control: EPA TO-11A - (HBN: 177647)</p> <p>LMB 520823 was used to media correct LCS 520824, LCSD 520825 and field samples for Acetone only.</p> <p>520824 LCS/520825 LCSD: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.</p>
<p>Quality Control: EPA TO-11A - (HBN: 177648)</p> <p>LMB 520826 was used to media correct LCS 520827, LCSD 520828 and field samples 021-040 for Acetone only.</p> <p>LCS 520827/LCSD 520828: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.</p>

## Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA TO-11A	/S/ Emilie Pratt 10/06/2016 15:57	/S/ Christopher Winter 10/06/2016 16:53

## Laboratory Contact Information

ALS Environmental  
 960 W Levoy Drive  
 Salt Lake City, Utah 84123

Phone: (801) 266-7700  
 Email: als.sl.lab@ALSGlobal.com  
 Web: www.als.sl.com



# ANALYTICAL REPORT

Workorder: **34-1627297**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### 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	ANAB (DoD ELAP)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</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/bdwlabservice.htm">http://ndep.nv.gov/bdwlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CSnew/">http://www.deq.state.ok.us/CSnew/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx">http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx</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>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
	Kansas	E-10416	<a href="http://www.kdheks.gov/lpo/index.html">http://www.kdheks.gov/lpo/index.html</a>
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

### Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.  
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.  
 ND = Not Detected, Testing result not detected above the LOD or LOQ.  
 NA = Not Applicable.  
 \* No result could be reported, see sample comments for details.  
 < This testing result is less than the numerical value.  
 ( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627297**

Limits: Historical Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: EPA TO-11A  
Batch: ILC/12748 (HBN: 177647)  
Analyzed By: Emilie Pratt

### Blank

LMB: 520823			
Analyzed: 10/03/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.0740	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520824					LCS-D: 520825				
Analyzed: 10/03/2016 00:00					Analyzed: 10/03/2016 00:00				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.90	3.00	96.5	87.8 116.8	2.97	99.0	2.52	0.0 20.0	
Acetaldehyde	2.90	3.00	96.7	94.7 110.5	2.98	99.2	2.59	0.0 20.0	
Acetone	3.02	3.00	101	89.2 119.9	3.18	106	5.23	0.0 20.0	
Acrolein	2.86	3.00	95.3	83.5 120.2	2.96	98.6	3.41	0.0 20.0	
Propionaldehyde	2.82	3.00	93.9	92.2 117.2	2.90	96.6	2.90	0.0 20.0	
Crotonaldehyde	2.88	3.00	96.0	93.1 114.8	2.86	95.4	0.557	0.0 20.0	
Butyraldehyde	2.74	3.00	91.2	86.6 120.8	2.87	95.6	4.75	0.0 20.0	
Benzaldehyde	2.86	3.00	95.5	96.0 112.3	2.92	97.4	1.97	0.0 20.0	
Isovaleraldehyde	2.96	3.00	98.6	95.4 121.6	3.10	103	4.82	0.0 20.0	
Valeraldehyde	3.06	3.00	102	85.3 120.4	3.20	107	4.60	0.0 20.0	
m-Tolualdehyde	2.80	3.00	93.4	80.9 118.6	2.88	95.9	2.84	0.0 20.0	
p-Tolualdehyde	2.78	3.00	92.8	83.5 122.2	2.80	93.2	0.466	0.0 20.0	
o-Tolualdehyde	2.82	3.00	93.9	91.6 111.4	2.93	97.6	3.83	0.0 20.0	
Hexanal	3.09	3.00	103	85.4 127.6	3.14	105	1.84	0.0 20.0	
2,5-Dimethylbenzaldehyde	2.87	3.00	95.5	99.6 118.7	2.82	94.1	1.48	0.0 20.0	



### Quality Control Sample Batch Report

#### Analysis Information

Workorder: 1627297

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: EPA TO-11A  
Batch: ILC/12748 (HBN: 177647)  
Analyzed By: Emilie Pratt

#### Comments

LMB 520823 was used to media correct LCS 520824, LCSD 520825 and field samples for Acetone only.

520824 LCS/520825 LCSD: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.

#### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Emilie Pratt 10/05/2016 15:42	/S/ Christopher Winter 10/06/2016 10:34

#### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627297**

Limits: Historical Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: EPA TO-11A  
Batch: ILC/12749 (HBN: 177648)  
Analyzed By: Emilie Pratt

### Blank

LMB: 520826			
Analyzed: 10/03/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.124	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520827					LCS0: 520828				
Analyzed: 10/03/2016 00:00					Analyzed: 10/03/2016 00:00				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.82	3.00	94.1	87.8 116.8	2.95	98.2	4.26	0.0 20.0	
Acetaldehyde	2.90	3.00	96.8	94.7 110.5	2.98	99.4	2.68	0.0 20.0	
Acetone	3.03	3.00	101	89.2 119.9	3.20	107	5.42	0.0 20.0	
Acrolein	2.82	3.00	94.0	83.5 120.2	2.92	97.3	3.45	0.0 20.0	
Propionaldehyde	2.84	3.00	94.5	92.2 117.2	2.92	97.2	2.75	0.0 20.0	
Crotonaldehyde	2.88	3.00	95.3	93.1 114.8	2.91	97.1	1.84	0.0 20.0	
Butyraldehyde	2.74	3.00	91.4	86.6 120.8	2.89	96.5	5.39	0.0 20.0	
Benzaldehyde	2.82	3.00	94.1	96.0 112.3	2.91	96.9	3.00	0.0 20.0	
Isovaleraldehyde	3.00	3.00	99.9	95.4 121.6	3.02	101	0.731	0.0 20.0	
Valeraldehyde	3.14	3.00	105	85.3 120.4	3.19	106	1.42	0.0 20.0	
m-Tolualdehyde	2.77	3.00	92.3	80.9 118.6	2.80	93.4	1.26	0.0 20.0	
p-Tolualdehyde	2.80	3.00	93.3	83.5 122.2	2.89	96.3	3.16	0.0 20.0	
o-Tolualdehyde	2.91	3.00	97.0	91.6 111.4	3.01	100	3.48	0.0 20.0	
Hexanal	3.08	3.00	103	85.4 127.6	3.14	105	1.93	0.0 20.0	
2,5-Dimethylbenzaldehyde	2.74	3.00	91.4	99.6 118.7	2.76	92.1	0.763	0.0 20.0	



### Quality Control Sample Batch Report

#### Analysis Information

Workorder: 1627297

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: EPA TO-11A  
Batch: ILC/12749 (HBN: 177648)  
Analyzed By: Emilie Pratt

#### Comments

LMB 520826 was used to media correct LCS 520827, LCSD 520828 and field samples 021-040 for Acetone only.

LCS 520827A, CSD 520828: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.


#### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Emilie Pratt 10/06/2016 15:57	/S/ Christopher Winter 10/06/2016 16:53

#### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

1627297

		<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>		C.O.C. No. 20162971 Page 1 of 4		
Collector Name: CARL ERVOLD TEL: 800-368-5777		Telephone No: 313-4861 MSN: 56-05 FAX: 373-1878		Sample Change Code: 2030372420		
Project Title: <b>WATER TREATMENT PLANT</b> (Shipped To Lab)		Lab/Work Package No.: <b>013</b> Date of Lab/Work Package: <b>01/10/06</b>		Date of Lab/Work Package: <b>01/10/06</b> Date of Lab/Work Package: <b>01/10/06</b>		
Protocol: <b>MSD</b>		Date Turnaround: <b>41367</b>		Preservative: <b>25C or Low</b>		
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
1	8167033625	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-A		25C or Low
2	8167033626	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-B		25C or Low
3	8167033627	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-C		25C or Low
4	8167033628	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-D		25C or Low
5	8167033629	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-E		25C or Low
6	8167033630	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-F		25C or Low
7	8167033631	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-G		25C or Low
8	8167033632	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-H		25C or Low
9	8167033633	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-I		25C or Low
10	8167033634	VA 09/23/16		ALDEHYDE 16-08 633-8-8A32-EFF-J		25C or Low
POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No						Hold Time
Requisitioned By: <b>Dianna Turner</b> Sign: <b>Dianna Turner</b> Date/Time: <b>9/27/16 1400</b> Requisitioned By: <b>JR Grady</b> Sign: <b>JR Grady</b> Date/Time: <b>9/27/16 0930</b> Requisitioned By: <b>WRPS</b> Sign: <b>WRPS</b> Date/Time: <b>9/27/16 0930</b> Requisitioned By: <b>Juli Gordon</b> Sign: <b>Juli Gordon</b> Date/Time: <b>9/27/16 0930</b> Requisitioned By: <b>REDEX</b> Sign: <b>REDEX</b> Date/Time: <b>9/27/16 0930</b>						Date/Time: <b>9/27/16 0930</b>
Disposal Method (w.g., Return to customer, per lab procedure, used in process)						Date/Time: <b>10/16/16 1400</b>

Assembler		C.O.C. No. 20142971				
N/A		Page 2 of 4				
Collector		Telephone No. 713-4862				
N/A		M/S/N 16-05 FAX 372-1878				
SAP No.		Purchase Order/Change Code				
N/A		20000/040				
Project Title		Item				
CANTONER EVALUATION		ON TOC				
Shipped To (Lab)		Job Chart No.				
ADD		MKS-03				
Prepound		Site of Origin/Alt. No.				
S/A		8009 0287 9403				
		Parts and Return No.				
		41367				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
11	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
12	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
13	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
14	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
15	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
16	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
17	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
18	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
19	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
20	SL120A GEL	09/23/16		ALdehyde 16-08635-8-22F-E		25C or Low
<b>POSSIBLE SAMPLE HAZARD/REMARKS (List all known/warning) MSDS</b> <input type="radio"/> Yes <input checked="" type="radio"/> No <b>Hold Time</b> SPECIAL INSTRUCTIONS Send Results to Carl Rowald IV and Greg Scanlan Carl Rowald IV and Greg Scanlan Greg@713_chemicals.com see 808 for email Release # Reference Contract # 30502 81033-2016 808						
Requested By	Date/Time	Received By	Date/Time	Misc*		
Dianne Turner	09/27/16	JA Gradisher	09/27/16	DL = Drum Liquids		
Requested By	Date/Time	Received By	Date/Time	TL = Tissue		
JA Gradisher	09/27/16	WRPS Gullie Gadsden	09/27/16	SO = Solid		
Requested By	Date/Time	Received By	Date/Time	SL = Sludge		
WRPS	09/27/16	WRPS	09/27/16	W = Water		
Requested By	Date/Time	Received By	Date/Time	O = Oil		
		WRPS	09/27/16	A = Air		
Requested By	Date/Time	Received By	Date/Time	DS = Drum Solids		
		WRPS	09/27/16			
<b>FINAL SAMPLE DISPOSITION</b> Dispose Method (e.g., return to customer, per lab procedure, used in process) Date/Time 10/13/16 12:00 Disposed By Elyse R. Pratt A-6003-882 (03/09)						





Assemblies		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		G.O.C. No. 20162971		
S/A				Page 4 of 4		
Collector Jones		Sample ID		M58N 372-1878		
Project Title		Sample Origin		Telephone No. 372-6851		
Shipped To (Lab)		Logbook Work Package No.		M58N Charge Code		
Preload		Method of Shipment		Lab Chem. No. WTS-013		
S/A		S/A		Bill of Lading/air Bill No. 8009 0227 8403		
		S/A		Pallet and Return No. 41367		
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analytica	Preservative
31	8167033635	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-9	25C de low
32	8167033636	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-8	25C de low
33	8167033637	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-A	25C de low
34	8167033638	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-B	25C de low
35	8167033639	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-C	25C de low
36	8167033640	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-D	25C de low
37	8167033641	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-E	25C de low
38	8167033642	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-F	25C de low
39	8167033643	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-G	25C de low
40	8167033644	VA 09/24/76		8111CA GEL	Aldehyde 16-08 816-8-287-H	25C de low
POSSIBLE SAMPLE MISIDENTIFICATION (Lit. or known material) MSDS Yes <input type="radio"/> No <input checked="" type="radio"/>						
SPECIAL INSTRUCTIONS						
Send Results to Carl Rowald IV and Gary Carl W. Rowald, Inc. and Carl W. Rowald, Inc. See 908 for email						
Release # Contract # 55502						
M58N 372-1878						
Relinquished By	From	Sign	Received By	Sign	Date/Time	Method*
Diane Turner	WRPS	9/27/76	JA Gradisher	WRPS	9/27/76	S = Soil DL = Drum Liquids
Relinquished By	From	Sign	Received By	Sign	Date/Time	SE = Sediment T = Tissue
WRPS	WRPS	9/27/76	WRPS	WRPS	9/27/76	SO = Solid W = Waste
Relinquished By	From	Sign	Received By	Sign	Date/Time	SL = Sludge L = Liquid
WRPS	WRPS	9/27/76	WRPS	WRPS	9/27/76	WV = Water V = Vegetation
Relinquished By	From	Sign	Received By	Sign	Date/Time	O = Oil VA = Vapor
WRPS	WRPS	9/27/76	WRPS	WRPS	9/27/76	A = Air X = Other
Relinquished By	From	Sign	Received By	Sign	Date/Time	DS = Drum Solids
WRPS	WRPS	9/27/76	WRPS	WRPS	9/27/76	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)						
Disposed By						
Date/Time						
9/3/76 15:20						

A-4000-862 (03/06)



ANALYTICAL REPORT

Report Date: October 05, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert\_w\_sosa@rl.gov

20162973

Workorder: **34-1627295**

Client Project ID: Washington River Protection  
So

Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033685</b>		Collected: 09/23/2016			
Lab ID: 1627295001		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: <b>S16T033686</b>		Collected: 09/23/2016			
Lab ID: 1627295002		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: <b>S16T033687</b>		Collected: 09/23/2016			
Lab ID: 1627295003		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992  
ALS GROUP USA, CORP. An ALS Limited Company



RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

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Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m³), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.





ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



# ANALYTICAL REPORT

Workorder: **34-1627295**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### Analytical Results

Sample ID: <b>S16T033723</b>		Collected: 09/23/2016		
Lab ID: 1627295039		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033724</b>		Collected: 09/23/2016		
Lab ID: 1627295040		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

### Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
<b>NIOSH 1024</b>	/S/ Fred Rejali 10/04/2016 20:14	/S/ Thomas J. Masoian 10/05/2016 08:22

### Laboratory Contact Information

ALS Environmental  
 960 W Levoay Drive  
 Salt Lake City, Utah 84123

Phone: (801) 266-7700  
 Email: [alstl.lab@ALSGlobal.com](mailto:alstl.lab@ALSGlobal.com)  
 Web: [www.alssl.com](http://www.alssl.com)



ANALYTICAL REPORT

Workorder: 34-1627295
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

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.

Table with 4 columns: Testing Sector, Accreditation Body (Standard), Certificate Number, Website. Rows include Environmental, Industrial Hygiene, Lead Testing, and Dietary Supplements.

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
\*\* No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both
technically and for completeness. Release of the data contained in this report has been electronically
authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



**Quality Control Sample  
Batch Report**

**Analysis Information**

<b>Workorder: 1627295</b>	<b>Preparation: NA</b>	<b>Analysis: NIOSH 1024</b>
Limits: Historical/Performance	Batch: NA	Batch: IFID/7808 (HBN: 177676)
Basis: ALS Laboratory Group	Prepared By: NA	Analyzed By: Fred Rejali

**Blank**

MB: 520884
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520887
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520890
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520893
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520898
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521241
Analyzed: 10/04/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

**Laboratory Control Sample - Laboratory Control Sample Duplicate**

LCS: 520885					LCSD: 520886				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0315	0.0342	92.1	78.0 117.6	0.0315	92.1	0.00	0.0 20.0	



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627295**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: NIOSH 1024  
Batch: IFID/7808 (HGN: 177676)  
Analyzed By: Fred Rejali

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520888					LCSD: 520889				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0285	0.0274	104	78.0 117.6	0.0285	105	0.350	0.0 20.0	

LCS: 520891					LCSD: 520892				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0291	0.0274	106	78.0 117.6	0.0285	104	2.08	0.0 20.0	

LCS: 520894					LCSD: 520895				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0276	0.0274	101	78.0 117.6	0.0262	95.8	5.20	0.0 20.0	

LCS: 520897					LCSD: 520898				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0267	0.0274	97.6	78.0 117.6	0.0273	99.8	2.22	0.0 20.0	

LCS: 521242					LCSD: 521243				
Analyzed: 10/04/2016 00:00					Analyzed: 10/04/2016 00:00				
Dilution: 1					Dilution: 1				
Units: mg/sample					Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0267	0.0274	97.6	78.0 117.6	0.0263	96.1	1.51	0.0 20.0	

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Fred Rejali 10/04/2016 20:14	/S/ Thomas J. Masoian 10/05/2016 08:20

### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

102788



**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

ASR # 1627295

COIC No. 20162973  
Page 1 of 4

Contract Requirer: DIAL RONALD JV  
Sample Origin: CHARLOTTE EVALUATOR  
Logbook/Work Package No.: WTS-013  
Method of Shipment: Bill of Lading/air Bill No. 8009 0227 8403  
Date Turnaround: 10 DAYS  
41367

Telephone No. 313-6861  
Purchase Order/Change Code: 1010070802  
MSEA 16-85 FAX 313-1878

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T031685	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-9-EP-G-PR2-A	CHILL -4C
	S16T031686	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-10-EP-G-PR2-B	CHILL -4C
	S16T031687	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-9-EP-B-PR2-A	CHILL -4C
	S16T031688	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-10-EP-B-PR2-B	CHILL -4C
	S16T031689	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-9-EP-BALR-A	CHILL -4C
	S16T031690	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-10-EP-BALR-B	CHILL -4C
	S16T031691	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-9-EP-A-PR2-A	CHILL -4C
	S16T031692	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-10-EP-A-PR2-B	CHILL -4C
	S16T031693	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-9-EP-C-PR2-A	CHILL -4C
	S16T031694	VA 09/23/16		CBM/COCAL TUBE	1,3-Butadiene 16-06633-10-EP-C-PR2-B	CHILL -4C

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS  Yes  No

SPECIAL INSTRUCTIONS: Hold Time

Send Results to Carl W Rowland Jr  
10000 W. Highway 101  
Greensboro, NC 27409  
cwr@ncdot.gov or call 336-716-7000 for email

Reference Contract # 53502  
Reference Number: 10000  
NCDOT 1024 CHILL BELOW -4 C

Retransmitted By	Sign	Date/Time	Received By	Sign	Date/Time	Method
Sheva Lybba	Sheva Lybba	9/27/16 0730	JA Gradisher	JA Gradisher	9/27/16 0930	FEDEX
Retransmitted by WRRS	Retransmitted by WRRS	9/27/16 1400	Received by	Received by		
Retransmitted by	Retransmitted by		Received by	Received by		

Disposal Method (e.g., Return to customer, per lab procedure) in process

Disposed By: Fred Rejala  
Date/Time: 10/04/16 2:00

Final Sample Disposition

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6903-952 (03/05)

Assembler R/A		C.O.C. No. 20162973 Page 2 of 4				
Collector Jones		Telephone No. 373-6161 MSN 16-05 FAX 372-1878				
SOP No. R/A		Purchase Order/Charge Code 330031/0233				
Project Title Construction Evaluation		Sample Origin CONCRETE EVALUATION				
Shipped To (Lab) Lab		Logbook Work Package No. N/A				
Protocol R/A		Method of Shipment N/A				
		Date Turnaround 10 DAYS				
		Date 09/23/16				
		Time				
		No./Type Container				
		Sample Analysis				
		Preservative				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
167031695	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-9-EP-9-PR2-A	CEH15 -4C
167031696	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-10-EP-D-PR2-B	CEH15 -4C
167031697	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-9-EP-9-PR2-A	CEH15 -4C
167031698	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-10-EP-E-PR2-B	CEH15 -4C
167031699	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-9-EP-9-PR2-A	CEH15 -4C
167031700	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-10-EP-F-PR2-B	CEH15 -4C
167031701	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-9-EP-9-PR2-A	CEH15 -4C
167031702	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-10-EP-B-PR2-B	CEH15 -4C
167031703	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-9-EP-9-PR2-A	CEH15 -4C
167031704	VA	09/23/16		CHARCOAL TUBE	1,2-Butadiene 16-08433-10-EP-BASE-A	CEH15 -4C
POSSIBLE SAMPLE HAZARDOUS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl W Rowald IV, CEH15@wvlegislature.gov or 304-586-3015, ceohq@wvlegislature.gov or 304-586-3015 for email. Reference Contract # 33062 RELEASE 11/08/16 CEH15 BELOW -4 C						
Requisitioned By Shirley Shaver-Libby	Sign [Signature]	Date/Time 9/27/16 09:30	Received By JA Gradisher	Sign [Signature]	Date/Time 9/27/16 09:30	Material* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids
Requisitioned By WRPS	Sign [Signature]	Date/Time 9/27/16 14:00	Received By WRPS	Sign [Signature]	Date/Time 9/27/16 09:30	Material* DL = Drum Liquids T = Tissue WI = Waste L = Liquid V = Vegetative VA = Vapor X = Other
Requisitioned By WRPS	Sign [Signature]	Date/Time 9/27/16 14:00	Received By WRPS	Sign [Signature]	Date/Time 9/27/16 09:30	Material* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	Material*
Requisitioned By	Sign	Date/Time	Received By	Sign	Date/Time	Material*
Disposal Method (e.g., return to customer, per lab procedure listed in process) Disposed by Fred R. Job. 10/04/16 2100 A-8003-662 (8/3/05)						



C.O.C. No. 20162973  
Page 3 of 4

### CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Contract/Requestor: **CAL HERRALD IV** Telephone No. **313-6641** MSN **16-43** FAX **313-1876**  
 Sample Origin: **CHALMERS EVALUATOR** Purchase Order/Change Code  
 SAF No. **LOGBOOK WORK PACKAGE NO.** Ion Chest No. **WTS-013** Temp. **043°C**  
 Project Title: **CHALMERS CONCURRENCE** Method of Shipment: **Bill of Lading/AV BR No. 8009 0227 8403**  
 Shipped To (Lab): **MS** Data Turnaround: **41367**  
 A/S: **MS**

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
S167033705	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-9-28-C-FRT-A	CHILL -4C
S167033706	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-10-28-C-FRT-B	CHILL -4C
S167033707	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-9-28-D-FRT-A	CHILL -4C
S167033708	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-10-28-D-FRT-B	CHILL -4C
S167033709	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-9-28-E-FRT-A	CHILL -4C
S167033710	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-10-28-E-FRT-B	CHILL -4C
S167033711	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-9-28-F-FRT-A	CHILL -4C
S167033712	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-10-28-F-FRT-B	CHILL -4C
S167033713	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-9-28-G-FRT-A	CHILL -4C
S167033714	VA	05/23/16		CHARCOAL TUBE	1,3-Butadiene 16-08435-10-28-G-FRT-B	CHILL -4C

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) **MSDS**  Yes  No **Hold Time**

**SPECIAL INSTRUCTIONS**  
 Send Results to Carl W. Howald, Jr., 20000 W. 10th St., Suite 100, Overland Park, KS 66204  
 Carl W. Howald, Jr., and cwhjr@wrps.com  
 Gregory J. Fehin, greg@wrps.com  
 Reference Contract # 55562  
 RELEASE #  
 NUCOR 1024 CHILL 8820F -4 C

Relinquished By	Print	Sign	Date/Time	Received By	Date/Time	Main*
Gregory J. Fehin	Gregory J. Fehin	Gregory J. Fehin	9/27/16 0930	Julie Cadon	9/27/16 0930	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids
WRPS	WRPS	WRPS	9/27/16 1400	FEDEX		DL = Drum Liquids T = Tissue VI = Vial L = Liquid V = Vegetation VA = Vapor X = Other
Relinquished By				Received By		
				Received By		
				Received By		

Disposal Method (e.g., Return to customer, per IAB procedure) **used in process** Date/Time **10/04/16 2:00**  
 Disposed By **Fred Reinh.**

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-8003-002 (03/06)

Assembler S/A		C.O.C. No. 20162973 Page 4 of 4	
<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>			
Contact/Requestor CAMIL BOWALD, TV	Telephone No. 373-4841	MSLN 16-05	FAX 372-1878
Sample Origin CANTONMENT, TRAILBLAZER	Package Order/Change Code 2010637020		
Project Title CANTONMENT EVALUATION	Ice Chest No. WTS-013	Temp. 020 INE	
Shipped To (Lab) AUC	Bill of Lading/Bill No. 8009 0227 8403		
Protocol S/A	Parts and Return No. 41362		

Sample No.	Lab ID	* Cells	Time	No./Type Container	Sample Analysis	Preservative
	S167033715	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-9-2R-0-72T-A 1	CELLS - FC
	S167033716	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-10-2R-0-72T-B 1	CELLS - FC
	S167033717	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-10-2R-0-72T-C 1	CELLS - FC
	S167033718	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-9-2R-0-72T-D 1	CELLS - FC
	S167033719	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-9-2R-0-72T-E 1	CELLS - FC
	S167033720	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-10-2R-0-72T-F 1	CELLS - FC
	S167033721	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-9-2R-0-72T-G 1	CELLS - FC
	S167033722	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-10-2R-0-72T-H 1	CELLS - FC
	S167033723	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-9-2R-0-72T-I 1	CELLS - FC
	S167033724	VA	09/23/16	CHAMCOAL TUBE	1,3-Butadiene 16-09635-10-2R-0-72T-J 1	CELLS - FC

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS  Yes  No Held Time

SPECIAL INSTRUCTIONS  
Send Results to Carl W. Dowald IV  
c.dowald@wrps.com  
Gregory\_S\_Scanlon@wrps.com for email  
Reference Container # 55502  
RELEASES  
PC001 1214 CELLS 082/09 -4 C

Requisitioned By Dawn M. Kuller	Print Sign M. Kuller	Date/Time 9/27/16 0930	Received By WRPS Julia Gradisher	Date/Time 9/27/16 0930	Matrix* DL = Drum Liquids T = Tissue WF = Wipe L = Liquid V = Vegetation VA = Vapor X = Other DS = Drums Solids
Requisitioned By WRPS Julia Gradisher	Print Sign Julia Gradisher	Date/Time 9/27/16 1400	Received By WRPS Julia Gradisher	Date/Time 9/27/16 1400	
Requisitioned By	Print Sign	Date/Time	Received By	Date/Time	
Requisitioned By	Print Sign	Date/Time	Received By	Date/Time	

Disposal Method (e.g., Return to customer, per lab procedure) (circled in process)  
Fred Rajab 10/04/16 2100

All samples containing hazardous materials shall be proved up by requestor and returned to parent container or site of origin.



# ANALYTICAL REPORT

Report Date: October 05, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

E-mail: [robert\\_w\\_sosa@rl.gov](mailto:robert_w_sosa@rl.gov)  
20162974

Workorder: **34-1627348**

Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033725</b>		Collected: 09/24/2016			
Lab ID: 1627346001		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: <b>S16T033726</b>		Collected: 09/24/2016			
Lab ID: 1627346002		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

Sample ID: <b>S16T033727</b>		Collected: 09/24/2016			
Lab ID: 1627346003		Received: 09/28/2016			
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016	
Sampling Parameter: <b>Air Volume Not Provided</b>					
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)	
1,3-Butadiene	<0.0010	NA	NA	0.0010	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992  
ALS GROUP USA, CORP. An ALS Limited Company

Environmental

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

RIGHT SOLUTIONS RIGHT PARTNER



ANALYTICAL REPORT

Workorder: 34-1627348
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627348
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



**ANALYTICAL REPORT**

Workorder: **34-1627348**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: <b>S16T033738</b>		Collected: 09/24/2016		
Lab ID: 1627348014		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033739</b>		Collected: 09/24/2016		
Lab ID: 1627348015		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033740</b>		Collected: 09/24/2016		
Lab ID: 1627348016		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033741</b>		Collected: 09/24/2016		
Lab ID: 1627348017		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033742</b>		Collected: 09/24/2016		
Lab ID: 1627348018		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



# ANALYTICAL REPORT

Workorder: **34-1627348**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033743</b>		Collected: 09/24/2016		
Lab ID: 1627348019		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033744</b>		Collected: 09/24/2016		
Lab ID: 1627348020		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033745</b>		Collected: 09/24/2016		
Lab ID: 1627348021		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033746</b>		Collected: 09/24/2016		
Lab ID: 1627348022		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: <b>S16T033747</b>		Collected: 09/24/2016		
Lab ID: 1627348023		Received: 09/28/2016		
Method: <b>NIOSH 1024</b>		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



# ANALYTICAL REPORT

Workorder: **34-1627348**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033749		Collected: 09/24/2016		
Lab ID: 1627348024		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T033750		Collected: 09/24/2016		
Lab ID: 1627348025		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T033751		Collected: 09/24/2016		
Lab ID: 1627348026		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T033752		Collected: 09/24/2016		
Lab ID: 1627348027		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T033753		Collected: 09/24/2016		
Lab ID: 1627348028		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010





ANALYTICAL REPORT

Workorder: 34-1627348
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



ANALYTICAL REPORT

Workorder: 34-1627348
Client Project ID: Washington River Protection
So
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.

Table with 5 columns: Analyte, Result (mg/sample), Result (mg/m^3), Result (ppm), RL (mg/sample). Row 1: 1,3-Butadiene, <0.0010, NA, NA, 0.0010.



# ANALYTICAL REPORT

Workorder: **34-1627348**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### Analytical Results

Sample ID: S16T033764		Collected: 09/24/2016		
Lab ID: 1627348039		Received: 09/28/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

### Report Authorization (S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1024	S/ Fred Rejali 10/04/2016 20:14	S/ Thomas J. Masoian 10/05/2016 08:22

### 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)  
 Web: [www.alssl.com](http://www.alssl.com)



# ANALYTICAL REPORT

Workorder: **34-1627348**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### 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	ANAB (DoD ELAP)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
	Utah (NELAC)	DATA 1	<a href="http://health.utah.gov/lab/labimp/">http://health.utah.gov/lab/labimp/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bd/wlabservice.htm">http://ndep.nv.gov/bd/wlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CS/new/">http://www.deq.state.ok.us/CS/new/</a>
	Iowa	IA# 376	<a href="http://www.iowadnr.gov/inside/CNR/Regulatory/Water.aspx">http://www.iowadnr.gov/inside/CNR/Regulatory/Water.aspx</a>
	Texas (TNI)	T 104704456-11-1	<a href="http://www.tceq.texas.gov/field/qalab_accred_certif.html">http://www.tceq.texas.gov/field/qalab_accred_certif.html</a>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/leap/labs/index.html">http://www.ecy.wa.gov/programs/leap/labs/index.html</a>
Industrial Hygiene	Kansas	E-10416	<a href="http://www.kdheks.gov/lpo/index.html">http://www.kdheks.gov/lpo/index.html</a>
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Lead Testing:	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/leap/labs/index.html">http://www.ecy.wa.gov/programs/leap/labs/index.html</a>
	CPSC	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
	Dietary Supplements	ACLASS (ISO 17025)	ADE-1420

### Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.  
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.  
 ND = Not Detected, Testing result not detected above the LOD or LOQ.  
 NA = Not Applicable.  
 \*\* No result could be reported, see sample comments for details.  
 < This testing result is less than the numerical value.  
 ( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627348**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: NIOSH 1024  
Batch: IFID/7808 (HBN: 177676)  
Analyzed By: Fred Rejali

### Blank

MB: 520884  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520887  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520890  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520893  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 520898  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521241  
Analyzed: 10/04/2016 00:00  
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520885 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 520886 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0315	0.0342	92.1	78.0 117.6	0.0315	92.1	0.00	0.0 20.0	



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627348**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: NIOSH 1024  
Batch: IFID/7808 (HBN: 177676)  
Analyzed By: Fred Rejali

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520888 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 520889 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0285	0.0274	104	78.0   117.6	0.0285	105	0.350	0.0   20.0	
LCS: 520891 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 520892 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
1,3-Butadiene	0.0291	0.0274	106	78.0   117.6	0.0285	104	2.08	0.0   20.0	
LCS: 520894 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 520895 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
1,3-Butadiene	0.0276	0.0274	101	78.0   117.6	0.0262	95.8	5.20	0.0   20.0	
LCS: 520897 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 520898 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
1,3-Butadiene	0.0267	0.0274	97.6	78.0   117.6	0.0273	99.8	2.22	0.0   20.0	
LCS: 521242 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521243 Analyzed: 10/04/2016 00:00 Dilution: 1 Units: mg/sample				
1,3-Butadiene	0.0267	0.0274	97.6	78.0   117.6	0.0263	96.1	1.51	0.0   20.0	

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Fred Rejali 10/04/2016 20:14	/S/ Thomas J. Masoian 10/05/2016 08:20

### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable

1627348



U

Assembler		C.O.C. No.	
N/A		20162974	
Collector		Page 1 of 4	
JOHNS		MSSN 26-15	
N/A		Telephone No. 773-6661	
N/A		Purchase Order/Change Code	
N/A		3435517/025	
Project Type		Temp.	
CONTAINER		WTS-013	
N/A		Ice Chest No. 02278403	
Shipped To (Lab)		Bill of Lading/IRL No. 8009 02278403	
N/A		Parts and Return No. 41367	
Protocol		N/A	
N/A		Date Returned	
N/A		10/04/16	
N/A		2100	

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
81.67033725	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-9-EP-A	CHILL -4C
81.67033726	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-10-EP-B	CHILL -4C
81.67033727	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-9-EP-A	CHILL -4C
81.67033728	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-10-EP-B	CHILL -4C
81.67033729	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-9-EP-A	CHILL -4C
81.67033730	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-10-EP-B	CHILL -4C
81.67033731	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-9-EP-A	CHILL -4C
81.67033732	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-10-EP-B	CHILL -4C
81.67033733	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-9-EP-A	CHILL -4C
81.67033734	VA	09/24/14		CHARCOAL TUBE	1,3-Butadiene 16-08636-10-EP-B	CHILL -4C

POSSIBLE SAMPLE HAZARDOUS REMARKS (List all known wastes) MSDS  Yes  No

SPECIAL INSTRUCTIONS  
 Send Results to Carl W. Rowald IV, Carl W. Rowald, LLC, and Greg Pascale, Gregory S. Schmitt, 21.000 and 308 For Email  
 Reference Contract # 30592  
 SELLER'S BLOSH 1124 CHILL BELOW -4 C

Requisitioned By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Method*
Sharon Walker		Sharon Walker	9/27/16 0930	JA Gradihar	JA Gradihar	9/27/16 0930		S = Soil
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			DL = Drum Liquids
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			T = Tissue
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			SE = Sediment
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			SO = Solid
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			SL = Sludge
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			W = Water
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			V = Vegetation
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			O = Oil
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			A = Air
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			X = Other
Requisitioned By		JA Gradihar	9/27/16 1400	WRPS	WRPS			DS = Drum Solids

Disposal Method (e.g., Return to customer, per lab procedure) (used in process)

Disposed By: Fred Rajabi

Date/Time: 10/04/16 2100

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Assemblies		C.O.C. No. 20162974				
N/A		Page 2 of 6				
<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>						
Collector JONES	Contact/Requestor CARL KORNALD IV	Telephone No. 773-4891	MUSE 26-05 FAX 372-1878			
SAP No. N/A	Sample Origin CHARLTON TOWNSHIP	Project Title CARBIDE EVALUATION	Inventory Control Charge Code 37003/CR2			
Shipped To (Lab) ALS	Method of Shipment N/A	Ice Chest No. WTS-013	Temp. 0.1°C			
Protocol N/A	Date Turnaround 10 DAYS	Bill of Lading/AFR No. 8009 0227 8X03				
		Parts and Return No. 41367				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	8165033735	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-A	CR115 -4C
	8165033736	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-B	CR115 -4C
	8165033737	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-A	CR115 -4C
	8165033738	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-B	CR115 -4C
	8165033739	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-A	CR115 -4C
	8165033740	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-B	CR115 -4C
	8165033741	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-A	CR115 -4C
	8165033742	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-B	CR115 -4C
	8165033743	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-A	CR115 -4C
	8165033744	VA	09/24/16	CHARCOAL TUBE	1,2-Butadiene 14-08656-10-EP-0-PR-B	CR115 -4C
<b>POSSIBLE SAMPLE HAZARD/REMARKS (Use all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</b>						
SPECIAL INSTRUCTIONS Send Results to: Carl W. Bwald IV, Carl W. Bwald IV, Environmental Sciences, 10000 W. 100th St., Overland Park, KS 66204-3000, Fax: 913-241-1100, Email: cwbald@waste.com Reference Contract # 35592 RELEASE 10/08/16 CR115 BELOW -4 C						
Retrieved by Julie Gadsden	Print Sign Date/Time 9/27/16 0930	Received by WRPS	Received by Julie Gadsden	Date/Time 9/27/16 0930	Date/Time 9/27/16 0930	Date/Time 0930
Retrieved by WRPS	Print Sign Date/Time 9/27/16 1400	Received by WRPS	Received by Julie Gadsden	Date/Time 9/27/16 1400	Date/Time 9/27/16 1400	Date/Time 1400
Retrieved by	Print Sign Date/Time	Received by	Received by Julie Gadsden	Date/Time	Date/Time	Date/Time
Disposal Method (e.g. Return to customer, per lab procedure) (use in process)						
FINAL SAMPLE DISPOSITION	Disposed by Fred Rejak					Date/Time 10/04/16 2100

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin. A-6003-953 (03/05)



Collector JONES  
 Sample Origin CASTLEDOE CHALMUTTIE  
 Project Title CASTLEDOE EVALUATION  
 Shipped To (Lab) AEA  
 Protocol S/A

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
8167013745	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3SE-A	CB115 -4C
8167013746	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-10-ZPT-3ASE-B	CB115 -4C
8167013747	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3PT-A	CB115 -4C
8167013749	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3PT-A	CB115 -4C
8167013750	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-10-ZH-3-3PT-B	CB115 -4C
8167013751	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3SE-A	CB115 -4C
8167013752	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-10-ZH-3-3SE-B	CB115 -4C
8167013753	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3PT-A	CB115 -4C
8167013754	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-10-ZH-3-3PT-B	CB115 -4C
8167013755	VA	09/24/16		CHARCOAL TUBE	1,1-Butadiene 16-08616-9-DH-3-3PT-A	CB115 -4C

POSSIBLE SAMPLE HAZARDOUS REMARKS (List all known wastes) MSDS  Yes  No  
 SPECIAL INSTRUCTIONS  
 Good Results to Call W Nevada, NV  
 Call W Nevada, NV and Greg Scallan  
 Gregory.L.Scallan@epa.gov see flow for email  
 Reference Contract # 55592  
 PRIORITY 1024 CB115 BELOW -4 C

Relinquished By: *Sharon Walker* Sign: *Sharon Walker* Date/Time: 09/24/16 9:27 AM  
 Relinquished By: *Jill Gradisher* Sign: *Jill Gradisher* Date/Time: 09/27/16 09:30  
 Relinquished By: *Jill Gradisher* Sign: *Jill Gradisher* Date/Time: 09/27/16 14:00  
 Relinquished By: *Melvinth* Sign: *Melvinth* Date/Time: 10/04/16 12:48  
 Relinquished By: *Fred Rajab* Sign: *Fred Rajab* Date/Time: 10/04/16 2:10

Received By: *Jill Gradisher* Sign: *Jill Gradisher* Date/Time: 09/27/16 09:30  
 Received By: *Melvinth* Sign: *Melvinth* Date/Time: 10/04/16 12:48  
 Received By: *Fred Rajab* Sign: *Fred Rajab* Date/Time: 10/04/16 2:10

Disposal Method (e.g., Return to customer, per lab procedure) used in process  
 Disposed By: *Fred Rajab* Date/Time: 10/04/16 2:10

FINAL SAMPLE DISPOSITION  
 All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

**CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST**

Assembly: S/A      C.O.C. No. 20162974      Page 4 of 4

Collector: Jones      Contact/Responsible: CHL, KIMBALL JV      Telephone No. 373-6961      Mail:      FAX: 372-1878

SNF No.      Sample Origin:      Purchase Order/Change Code:      3000170039

Project Title:      Logbook/Work Package No.      Ion Chest No.      Temp.      0.5 TCS

Shipped To (Lab):      Method of Shipment:      Bill of Lading/Air Bill No.      8009 0227.8Y03

Protocol:      Data Turnaround:      Parts and Return No.      41367

Sample No.	Lab ID	Date	Time	Net/Type Container	Sample Analysis	Preservative
8167033756	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-B	CRILL -6C
8167033757	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-A	CRILL -6C
8167033758	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-B	CRILL -6C
8167033759	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-A	CRILL -6C
8167033760	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-B	CRILL -6C
8167033761	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-A	CRILL -6C
8167033762	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-B	CRILL -6C
8167033763	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-A	CRILL -6C
8167033764	VA	09/24/16		CHARCOAL TUBE	1,3-BUTADIENE 16-04036-10-20-0-PRE-B	CRILL -6C

POSSIBLE SAMPLE HAZARDOUSNESS (list all known wastes) MSDS  Yes  No      SPECIAL INSTRUCTIONS:      Held Time

Requested by:      Date/Time:      Received by:      Date/Time:      Method:      Date/Time:      Disposed by:      Date/Time:      Final Sample Disposition:      Date/Time:      2100

Requested by: *Shawn Halder, Michael 9/27/16 0930*      Received by: *WRPS Julie Cochran 9/27/16 0800*      Method: *FEDEX*      Date/Time:      Disposed by: *Fred Rejcek 10/04/16*      Final Sample Disposition:      Date/Time:      2100

Requested by: *WRPS Julie Cochran 9/27/16 1400*      Received by: *WRPS Julie Cochran 9/27/16 1400*      Method: *FEDEX*      Date/Time:      Disposed by: *Fred Rejcek 10/04/16*      Final Sample Disposition:      Date/Time:      2100

Requested by:      Date/Time:      Received by:      Date/Time:      Method:      Date/Time:      Disposed by:      Date/Time:      Final Sample Disposition:      Date/Time:      2100

Disposal Method (e.g., Return to customer, per lab procedure used in process)

All samples containing hazardous materials shall be picked up by requester and returned to parent container or site of origin.

A-6003-062 (03/05)



# ANALYTICAL REPORT

Report Date: October 05, 2016

Robert (Buddy) Sosa  
Washington River Protection So  
PO Box 850, MSIN T6-02  
Richland, WA 99352

Phone: (509) 373-1262

E-mail: robert\_w\_sosa@rl.gov

20162969

Workorder: **34-1627303**

Client Project ID: Washington River Protection  
So

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

## Analytical Results

Sample ID: <b>S16T033525</b>	Collected: 09/23/2016			
Lab ID: 1627303001	Received: 09/28/2016			
Method: <b>NIOSH 1613 Mod.</b>	Media: SKC 226-01, Charcoal Tube 100/50mg			
Analyzed: 09/30/2016				
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: <b>S16T033526</b>	Collected: 09/23/2016			
Lab ID: 1627303002	Received: 09/28/2016			
Method: <b>NIOSH 1613 Mod.</b>	Media: SKC 226-01, Charcoal Tube 100/50mg			
Analyzed: 09/30/2016				
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: <b>S16T033527</b>	Collected: 09/23/2016			
Lab ID: 1627303003	Received: 09/28/2016			
Method: <b>NIOSH 1613 Mod.</b>	Media: SKC 226-01, Charcoal Tube 100/50mg			
Analyzed: 09/30/2016				
Sampling Parameter: <b>Air Volume Not Provided</b>				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

ADDRESS: 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE: +1 801 266 7700 | FAX: +1 801 268 9992  
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### ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033528		Collected: 09/23/2016		
Lab ID: 1627303004		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033529		Collected: 09/23/2016		
Lab ID: 1627303005		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033530		Collected: 09/23/2016		
Lab ID: 1627303006		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033531		Collected: 09/23/2016		
Lab ID: 1627303007		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



**ANALYTICAL REPORT**

Workorder: **34-1627303**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033532		Collected: 09/23/2016		
Lab ID: 1627303008		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033533		Collected: 09/23/2016		
Lab ID: 1627303009		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033534		Collected: 09/23/2016		
Lab ID: 1627303010		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033535		Collected: 09/23/2016		
Lab ID: 1627303011		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



## ANALYTICAL REPORT

Workorder: **34-1627303**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

### Analytical Results

Sample ID: S16T033536 Lab ID: 1627303012	Collected: 09/23/2016 Received: 09/28/2016			
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg Analyzed: 09/30/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033537 Lab ID: 1627303013	Collected: 09/23/2016 Received: 09/28/2016			
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg Analyzed: 09/30/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033538 Lab ID: 1627303014	Collected: 09/23/2016 Received: 09/28/2016			
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg Analyzed: 09/30/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033539 Lab ID: 1627303015	Collected: 09/23/2016 Received: 09/28/2016			
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg Analyzed: 09/30/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



**ANALYTICAL REPORT**

Workorder: **34-1627303**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033540		Collected: 09/23/2016		
Lab ID: 1627303016		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033541		Collected: 09/23/2016		
Lab ID: 1627303017		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033542		Collected: 09/23/2016		
Lab ID: 1627303018		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033543		Collected: 09/23/2016		
Lab ID: 1627303019		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



**ANALYTICAL REPORT**

Workorder: **34-1627303**  
Client Project ID: Washington River Protection  
So  
Purchase Order: 55502 Rel9  
Project Manager: Rand Potter

**Analytical Results**

Sample ID: S16T033544		Collected: 09/23/2016		
Lab ID: 1627303020		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/30/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033545		Collected: 09/24/2016		
Lab ID: 1627303021		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033546		Collected: 09/24/2016		
Lab ID: 1627303022		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033547		Collected: 09/24/2016		
Lab ID: 1627303023		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50





### ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033548		Collected: 09/24/2016		
Lab ID: 1627303024		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033549		Collected: 09/24/2016		
Lab ID: 1627303025		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033550		Collected: 09/24/2016		
Lab ID: 1627303026		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033551		Collected: 09/24/2016		
Lab ID: 1627303027		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



### ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033552		Collected: 09/24/2016		
Lab ID: 1627303028		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033553		Collected: 09/24/2016		
Lab ID: 1627303029		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033554		Collected: 09/24/2016		
Lab ID: 1627303030		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033555		Collected: 09/24/2016		
Lab ID: 1627303031		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



### ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033556		Collected: 09/24/2016		
Lab ID: 1627303032		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033557		Collected: 09/24/2016		
Lab ID: 1627303033		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033558		Collected: 09/24/2016		
Lab ID: 1627303034		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033559		Collected: 09/24/2016		
Lab ID: 1627303035		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



### ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

#### Analytical Results

Sample ID: S16T033560		Collected: 09/24/2016		
Lab ID: 1627303036		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033561		Collected: 09/24/2016		
Lab ID: 1627303037		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033562		Collected: 09/24/2016		
Lab ID: 1627303038		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T033563		Collected: 09/24/2016		
Lab ID: 1627303039		Received: 09/28/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/04/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



# ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

## Analytical Results

Sample ID: S16T033564	Collected: 09/24/2016			
Lab ID: 1627303040	Received: 09/28/2016			
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			
Analyzed: 10/04/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m <sup>3</sup> )	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

## Comments

### Quality Control: NIOSH 1613 Mod. - (HBN: 177599)

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed. The ending CCV failed high for pyridine and 2,4-dimethylpyridine. Since all the samples were below the reporting limit for pyridine and 2,4-dimethylpyridine, the data is valid per IH-QA-009, Section 6.3.3.

### Quality Control: NIOSH 1613 Mod. - (HBN: 177738)

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed. The back sorbent section of sample 1627303036 was lost during extraction and the front section was analyzed like normal with no positive hits being detected.

## Report Authorization (iS/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1613 Mod.	iS/ David Teynor 10/05/2016 11:12	iS/ Thomas J. Masolan 10/05/2016 14:39

## Laboratory Contact Information

ALS Environmental  
 960 W Levoe Drive  
 Salt Lake City, Utah 84123

Phone: (801) 266-7700  
 Email: alsst.lab@ALSGlobal.com  
 Web: www.alsinc.com



# ANALYTICAL REPORT

Workorder: **34-1627303**  
 Client Project ID: Washington River Protection  
 So  
 Purchase Order: 55502 Rel9  
 Project Manager: Rand Potter

### 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	ANAB (DoD ELAP)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
	Utah (NELAC)	DATA1	<a href="http://health.utah.gov/lab/bimpr/">http://health.utah.gov/lab/bimpr/</a>
	Nevada	UT00009	<a href="http://ndep.nv.gov/bdnlabservice.htm">http://ndep.nv.gov/bdnlabservice.htm</a>
	Oklahoma	UT00009	<a href="http://www.deq.state.ok.us/CS/new/">http://www.deq.state.ok.us/CS/new/</a>
	Iowa	IA# 378	<a href="http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx">http://www.iowadnr.gov/insideDNR/Regulatory/Water.aspx</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>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
	Kansas	E-10418	<a href="http://www.kdheks.gov/lpo/index.html">http://www.kdheks.gov/lpo/index.html</a>
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
	Washington	C596-16	<a href="http://www.ecy.wa.gov/programs/eap/labs/index.html">http://www.ecy.wa.gov/programs/eap/labs/index.html</a>
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	<a href="http://www.anab.org/accredited-organizations/">http://www.anab.org/accredited-organizations/</a>
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	<a href="http://www.aihaaccreditedlabs.org">http://www.aihaaccreditedlabs.org</a>
Dietary Supplements	ACLASS (ISO 17025)	ADE-1420	<a href="http://www.aiclasscorp.com">http://www.aiclasscorp.com</a>

### Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.  
 LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.  
 ND = Not Detected, Testing result not detected above the LOD or LOQ.  
 NA = Not Applicable.  
 \* No result could be reported, see sample comments for details.  
 < This testing result is less than the numerical value.  
 ( ) This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627303**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: NIOSH 1613 Mod.  
Batch: ISVO/3182 (HBN: 177599)  
Analyzed By: David Teynor

### Blank

LMB: 520720			
Analyzed: 09/30/2016 10:13			
Units: ug/sample			
Analyte	Result	MDL	RL
Pyridine	ND	NA	0.500
2,4-Dimethylpyridine	ND	NA	0.500

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 520721					LCSD: 520722				
Analyzed: 09/30/2016 10:32					Analyzed: 09/30/2016 10:52				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	0.633	1.00	63.3	61.8 141.1	0.699	69.9	9.85	0.0 22.1	
2,4-Dimethylpyridine	0.632	1.00	63.2	51.7 130.6	0.686	68.6	8.15	0.0 22.2	

### Comments

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed. The ending CCV failed high for pyridine and 2,4-dimethylpyridine. Since all the samples were below the reporting limit for pyridine and 2,4-dimethylpyridine, the data is valid per IH-QA-009, Section 6.3.3.

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ David Teynor 10/05/2016 11:12	/S/ Thomas J. Masolan 10/05/2016 14:16

### 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
- - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected [U - Qualifier also flags analyte as not detected]
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



## Quality Control Sample Batch Report

### Analysis Information

**Workorder: 1627303**

Limits: Historical/Performance  
Basis: ALS Laboratory Group

Preparation: NA  
Batch: NA  
Prepared By: NA

Analysis: NIOSH 1613 Mod.  
Batch: ISVO/3185 (HBN: 177738)  
Analyzed By: David Teynor

### Blank

LMB: 521043			
Analyzed: 10/04/2016 09:24			
Units: ug/sample			
Analyte	Result	MDL	RL
Pyridine	ND	NA	0.500
2,4-Dimethylpyridine	ND	NA	0.500

### Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521044					LCSD: 521045				
Analyzed: 10/04/2016 09:44					Analyzed: 10/04/2016 10:04				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	0.998	1.00	99.8	61.8 141.1	1.03	103	3.02	0.0 22.1	
2,4-Dimethylpyridine	0.893	1.00	89.3	51.7 130.6	1.03	103	14.5	0.0 22.2	

### Comments

The referenced method has not been validated for 2,4-dimethylpyridine. Additionally, studies regarding media collection efficiency, sample storage stability, analyte retention capability, and/or analyte desorption efficiency have not been performed. The back sorbent section of sample 1627303036 was lost during extraction and the front section was analyzed like normal with no positive hits being detected.

### QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ David Teynor 10/05/2016 11:07	/S/ Thomas J. Masojan 10/05/2016 14:38

### 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
- ⊕ - Result is above the calibration range
- RPD - Relative % Difference (Spike / Spike Duplicate)
- ND - Not Detected (U - Qualifier also flags analyte as not detected)
- NA - Not Applicable
- QC results are not adjusted for moisture correction, where applicable



1st Set

1627303

Lab		Sample No.		Date		Time		Dish		Time		Dish		Time		Dish		Time	
81.67033525	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033526	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033527	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033528	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033529	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033530	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033531	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033532	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033533	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16
81.67033534	VA	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16	9/23/16

POSSIBLE SAMPLE HAZARDOUS/RESIDUES (List all known wastes) MSDS  Yes  No

SPECIAL INSTRUCTIONS  
Send results to Carl Rowald IV and Greg Scallan  
Carl\_W.Rowald@epa.gov and Greg@epa.gov see epc for email

Received by: *Julie Gardner* 9/27/16 0930  
Received by: *Julie Gardner* 9/27/16 0930  
Received by: *Julie Gardner* 9/27/16 1400  
Received by: *Julie Gardner* 9/27/16 1400

Received by: *Michelle Rowland* 9/27/16 78:57  
Received by: *Michelle Rowland* 9/27/16 78:57

Disposal Method (e.g., Return to customer, per lab procedure, used in process):  
Per Procedure

FINAL SAMPLE DISPOSITION: Per Procedure

Chain of Custody/Sample Analysis Request Form Details:  
 CCLC No. 20162969 Page 1 of 4  
 Telephone No. 373-4841 FAX 373-1898  
 Purchase Order/Charge Code  
 Sample Origin  
 Laboratory/Contractor  
 Logbook/Work Package No.  
 Method of Shipment  
 Date Returned 4/13/17  
 Pallet and Return No. 41367  
 Project Title: *VA*  
 Contract No.: *VA*  
 Job No.: *VA*  
 Job Description: *VA*  
 Shipper's Name: *VA*  
 Shipper's Address: *VA*  
 Shipper's Phone: *VA*  
 Shipper's Email: *VA*  
 Date of Receipt: *VA*  
 Date of Release: *VA*  
 Date of Storage: *VA*  
 Date of Disposal: *VA*  
 Date of Analysis: *VA*  
 Date of Reporting: *VA*  
 Date of Archiving: *VA*  
 Date of Destruction: *VA*  
 Date of Recycling: *VA*  
 Date of Reuse: *VA*  
 Date of Other: *VA*

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. No. 20162969 Page 2 of 4		
Collector N/A	Contract/Manufacturer Carl Rowald IV	Telephone No. 711-6163	MIS# 24-35	FAX 372-1878		
Job No.	Sample Origin Charlottesville	Purchase Order/Charge Code	30303/088			
Product Type CONTAINER EVALUATION	Labcode Work Package No. N/A	Lot Order No. N/A	Item ON IO			
Shipped To (Lab)	Method of Shipment	Bill of Lading/AF Bill No.	8009 0287 8403			
Received N/A	Date Turnaround 1-2 BUS	Part and Return No.	41367			
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
5167033535	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-F-9	N/A
5167033536	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-F-8	N/A
5167033537	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-A	N/A
5167033538	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-B	N/A
5167033539	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-C	N/A
5167033540	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-D	N/A
5167033541	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-E	N/A
5167033542	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-F	N/A
5167033543	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-G	N/A
5167033544	VA	9/23/16		CHARCOAL TUBE	Pyridines 16-08635-11-2B-H	N/A
POSSIBLE SAMPLE HAZARDOUSNESS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send results to Carl Rowald IV and Greg Carl W Rowald@cl.gov and Gregory J Rowald@cl.gov see below for email WEISS 9 Jefferson Contract # 55562 Prit Received By: <i>Dianna Turner</i> Date/Time: <i>9/23/16 0730</i> Received By: <i>Juli Gradishar</i> Date/Time: <i>9/23/16 1400</i> Retransmitted By: <i>Juli Gradishar</i> Date/Time: <i>9/23/16 1400</i> Retransmitted By: _____ Date/Time: _____ Received By: _____ Date/Time: _____ Received By: <i>Michelle Schuch</i> Date/Time: <i>9/28/16 18:47</i> Received By: _____ Date/Time: _____ Disposed By: <i>John Bar</i> Date/Time: <i>9/29/16 14:00</i> Disposal Method (e.g., return to customer, per lab procedure, used in process) Per Procedure						
Requisitioned By: <i>Dianna Turner</i> Sign: _____ Requisitioned By: <i>Juli Gradishar</i> Sign: _____ Requisitioned By: _____ Sign: _____ Requisitioned By: _____ Sign: _____		Received By: <i>Juli Gradishar</i> Sign: _____ Received By: _____ Sign: _____ Received By: _____ Sign: _____ Received By: _____ Sign: _____		Date/Time: <i>9/23/16 0730</i> Date/Time: <i>9/23/16 1400</i> Date/Time: _____ Date/Time: _____		Matrix: S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DG = Drum Solids OL = Drum Liquids T = Tissue VS = Waste L = Liquid V = Vegetation VA = Vapor X = Other

Zad Set

Assembler N/A		CO.C. No. 20162969 Page 3 of 4				
<b>CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</b>						
Collector Jesse		Telephone No. 313-6811 868N TO-05 FAX 372-1878				
Container/Procedural Code: 100004-17		Previous Order/Charge Code 2105000-000				
Sample Origin Construction		For Client Use WIS-013				
SAP No. N/A		Date of Receipt 10/18/16				
Project Title Cathodic Protection		Bill of Lading/IR Bill No. 8109 0227 8103				
Shipped To (Lab) AUS		Parts and Return No. 41367				
Preload N/A		Data Turnaround 10 DAYS				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
5167533545	VA	9/24/16		Pyridines 16-08036-11-BASE-3TT		N/A
5167533546	VA	9/24/16		Pyridines 16-08036-11-BASE-2M		N/A
5167533547	VA	9/24/16		Pyridines 16-08036-11-BASE-EFF		N/A
5167533548	VA	9/24/16		Pyridines 16-08036-11-BASE-2S		N/A
5167533549	VA	9/24/16		Pyridines 16-08036-11-EFF-A		N/A
5167533550	VA	9/24/16		Pyridines 16-08036-11-EFF-B		N/A
5167533551	VA	9/24/16		Pyridines 16-08036-11-EFF-C		N/A
5167533552	VA	9/24/16		Pyridines 16-08036-11-EFF-D		N/A
5167533553	VA	9/24/16		Pyridines 16-08036-11-EFF-E		N/A
5167533554	VA	9/24/16		Pyridines 16-08036-11-EFF-F		N/A
POSSIBLE SAMPLE HAZARDS/REMARKS (List all brown marks) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Rowald IV and Greg Carl W. Rowald, per email cwr@pcy_3_boston.com, see SOW for email RELEASE 9 REFERENCE CONTRACT # 55502						
Requested By Diane Ince	Sign Diane Ince	Date/Time 9/27/16 0930	Received By Julie Gudwin	Sign Julie Gudwin	Date/Time 9/27/16 0930	Matrix* S = Soil DL = Drain Liquids T = Tissue SO = Solid VA = Vape SL = Sludge L = Liquid W = Water V = Vegetation O = Oil A = Air DS = Drum Solids
Requested By MSPS	Sign Julie Gudwin	Date/Time 9/27/16 1400	Received By MSPS	Sign MSPS	Date/Time 9/27/16 1400	
Requested By	Sign	Date/Time	Received By	Sign	Date/Time	
Requested By	Sign	Date/Time	Received By	Sign	Date/Time	
Final Sample Description Per Procedure	Disposition Method (e.g., Return to customer, per lab procedure, used in process)		Disposition By Per Procedure		Date/Time 10/18/16 13:50	
All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.						

C.O.C. No. 20162969  
Page 4 of 4

### CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

Telephone No. 773-4861 MSN 16-05 FAX 312-3878  
 PUNONS OPERATIONS  
 2010010101  
 For Client No. WIS-013  
 Bill of Lading/Bill No. 8009 02218403  
 Parts and Return No. 41367

Contact/Requestor: Case, Roxana, TX  
 Sample Origin: Chemical, Trinitrotoluene  
 Logbook/Work Package No.: N/A  
 Method of Shipment: By Air  
 Date Turnaround: 10 days

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
S167033555	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-8FF-G	N/A
S167033556	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-8FF-B	N/A
S167033557	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-A	N/A
S167033558	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-B	N/A
S167033559	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-C	N/A
S167033560	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-D	N/A
S167033561	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-E	N/A
S167033562	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-F	N/A
S167033563	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-G	N/A
S167033564	VA	9/24/16		CHARCOAL TUBE	Fyr-Idlines 16-08036-11-DR-H	N/A

POSSIBLE SAMPLE HAZARD/SRSMARKS (List all known wastes)  YES  NO  
 SPECIAL INSTRUCTIONS: Send Results to Capt. Rowland 2P and Greg  
Carla W Rowland2p1.gpr and  
Gregory\_J\_Scanlan2p1.gpr see doc for email  
 RELEASE 9  
 Reference Contract # 95512

Requested By: PTC Received By: Juli, Graham, Jelle's Custom Date/Time: 9/27/16 0930  
 Requisition #: WPPS Received By: WPPS Date/Time: 9/27/16 1400  
 Requisitioned by: Juli's Custom Date/Time: 9/27/16  
 Requisitioned By: WPPS Date/Time: 9/27/16

Method: DL = Drum Liquids, T = Tissue, SE = Sediment, WM = Waste, SO = Solid, L = Liquid, SL = Sludge, V = Vapor, W = Water, O = Oil, A = Air, X = Other, DS = Drum Solids

Disposal Method (e.g., return to customer, per lab procedure, used in process)  
 Final Sample Disposition: Per Procedure  
 Date/Time: 9/27/16 13:50  
 Disposed By: Jyanta  
 A-6000-962 (03/05)



Carl Howald IV

11/21/16

 Washington River Protection Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352

Contract No.: 55503 R5

Project: Cartridge Evaluation

**Subject: Nitrosamines Analysis Report, Group Number 20162968**

Enclosed is the final report for group 20162968 number analyzed for Nitrosamines using NIOSH 2522-Modified. This group number 20162968 has been assigned a Columbia Basin Analytical Laboratories login order number of W609129. This report consists of a summary report of the samples, a laboratory report of each nitrosamine, a single quality control report for the analysis batch, and a copy of the chain of custody.

**General Set Comments**

Columbia Basin Analytical Laboratories received 40 samples on 09/27/16 to be tested for Nitrosamines. The samples were analyzed in accordance with NIOSH 2522-Modified for N-Nitrosodimethylamine, N-Nitrosomethylethylamine, N-Nitrosodiethylamine, N-Nitrosodi-n-propylamine, N-Nitrosodi-n-butylamine, N-Nitrosopiperidine, N-Nitrosopyrrolidine, and N-Nitrosomorpholine. All results have been corrected for desorption efficiency and measurable levels in the blanks.

\* Analyte not detected at or above MRL on initial analysis. Analyte detected at or above MRL on confirmation analysis. Analyte not confirmed.

X- Analyte detected at or above MRL on initial analysis. Analyte not detected at or above MRL on confirmation analysis. Analyte not confirmed.

**Results**

There were detectable nitrosamines concentrations at or above the reporting limit in the samples.

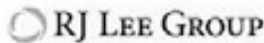
SampleName	Lab ID	Analyzed	Analyte	Results	RL	Units	Flags
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-EFF-E	S16T033481	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube	

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Report Template: WRPS\_Nitrosamines 2.1.rpt

 Approved: 11/4/16 19:26  
 Report Time Stamp: 11/21/16 17:34



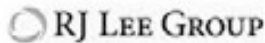
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosomorpholine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-EFF-F	S16T033482	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosodimethylamine	<0.017	<b>0.017</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosomethylethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosomorpholine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-EFF-G	S16T033483	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosodimethylamine	<0.017	<b>0.017</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosomethylethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosomorpholine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-EFF-H	S16T033484	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/21/16	N-Nitrosodimethylamine	3.171	<b>0.281</b>	µg/tube	D
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosomethylethylamine	0.025	<b>0.022</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosomorpholine	0.041	<b>0.022</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-A	S16T033485	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/21/16	N-Nitrosodimethylamine	3.267	<b>0.281</b>	µg/tube	D
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosomethylethylamine	0.030	<b>0.022</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosomorpholine	0.041	<b>0.022</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-B	S16T033486	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/21/16	N-Nitrosodimethylamine	3.239	<b>0.281</b>	µg/tube	D
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosomethylethylamine	0.032	<b>0.022</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosomorpholine	0.036	<b>0.022</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-C	S16T033487	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/21/16	N-Nitrosodimethylamine	3.446	<b>0.281</b>	µg/tube	D
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosodi-n-propylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosomethylethylamine	0.031	<b>0.022</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosomorpholine	0.033	<b>0.022</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosopiperidine	<0.023	<b>0.023</b>	µg/tube	
16-08635-12-IN-D	S16T033489	10/18/16	N-Nitrosopyrrolidine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosodiethylamine	<0.022	<b>0.022</b>	µg/tube	
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosodimethylamine	<0.017	<b>0.017</b>	µg/tube	
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosodi-n-butylamine	<0.023	<b>0.023</b>	µg/tube	

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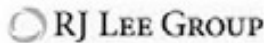
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-BASE-EFF	S16T033490	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-BASE-IN	S16T033491	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-BLANK1	S16T033492	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-BLANK2	S16T033493	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-EFF-A	S16T033494	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-EFF-B	S16T033495	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08635-12-EFF-C	S16T033496	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube

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16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-EFF-D	S16T033497	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-E	S16T033498	10/21/16	N-Nitrosodimethylamine	2.893	0.281	µg/tube	D
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosomethylethylamine	0.031	0.022	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosomorpholine	0.032	0.022	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-IN-E	S16T033498	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-F	S16T033499	10/22/16	N-Nitrosodimethylamine	3.090	0.281	µg/tube	D
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosomethylethylamine	0.029	0.022	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-IN-F	S16T033499	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-G	S16T033500	10/22/16	N-Nitrosodimethylamine	2.894	0.281	µg/tube	D
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosomethylethylamine	0.032	0.022	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-IN-G	S16T033500	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-H	S16T033501	10/21/16	N-Nitrosodimethylamine	2.794	0.281	µg/tube	D
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosomethylethylamine	0.025	0.022	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08635-12-IN-H	S16T033501	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-BASE-EFF	S16T033502	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	


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16-08636-12-BASE-IN	S16T033503	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-BLANK-EFF	S16T033504	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-BLANK-IN	S16T033505	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-EFF-A	S16T033506	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-EFF-B	S16T033507	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-EFF-C	S16T033508	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-EFF-D	S16T033509	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube

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16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-EFF-E	S16T033510	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-EFF-F	S16T033511	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-EFF-G	S16T033512	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-EFF-H	S16T033513	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-IN-A	S16T033514	10/21/16	N-Nitrosodimethylamine	3.038	0.280	µg/tube	D
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	*
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosomethylethylamine	0.028	0.021	µg/tube	
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosomorpholine	0.037	0.021	µg/tube	
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-IN-A	S16T033514	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-IN-B	S16T033515	10/22/16	N-Nitrosodimethylamine	1.205	0.224	µg/tube	D
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-IN-B	S16T033515	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube	
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-IN-C	S16T033516	10/21/16	N-Nitrosodimethylamine	3.394	0.280	µg/tube	D
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	*
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube	
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosomethylethylamine	0.035	0.021	µg/tube	
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosomorpholine	0.032	0.021	µg/tube	
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-08636-12-IN-C	S16T033516	10/19/16	N-Nitrosopyrrolidine	0.027	0.022	µg/tube	X
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube	
16-08636-12-IN-D	S16T033517	10/21/16	N-Nitrosodimethylamine	2.978	0.280	µg/tube	D
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube	

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16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosomethylethylamine	0.031	0.021	µg/tube
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosomorpholine	0.031	0.021	µg/tube
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-IN-D	S16T033517	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-IN-E	S16T033518	10/22/16	N-Nitrosodimethylamine	3.275	0.280	µg/tube D
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosomethylethylamine	0.035	0.021	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosomorpholine	0.032	0.021	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-IN-E	S16T033518	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-IN-F	S16T033519	10/22/16	N-Nitrosodimethylamine	2.692	0.280	µg/tube D
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosomethylethylamine	0.030	0.021	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosomorpholine	0.026	0.021	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-IN-F	S16T033519	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-IN-G	S16T033520	10/21/16	N-Nitrosodimethylamine	2.758	0.280	µg/tube D
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosomethylethylamine	0.030	0.021	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosomorpholine	0.024	0.021	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-IN-G	S16T033520	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	µg/tube
16-08636-12-IN-H	S16T033521	10/22/16	N-Nitrosodimethylamine	2.656	0.280	µg/tube D
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosomethylethylamine	0.027	0.021	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-08636-12-IN-H	S16T033521	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	µg/tube

**Recovery Failures in the ICV, CCVs, LCSs, RL and MRL**

There were no recovery failures in the CCVs, ICV, LCSs, MRL.

**RSD Failures in the LCSs**

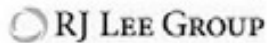
There were no RSD failures between the laboratory control samples.

**Measurable Blank Values**

There were no measurable analytes in the blank samples.

**Calibration Curves**

The calibration curves for the Nitrosamines had an R-value that was 0.997 or better, over a range of 5.0 ng/mL to 200 ng/mL.



**General Lab Comments**

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The results provided in this report relate only to the items tested. Samples were received in acceptable conditions unless otherwise noted in the comments above. Samples have not been field blank corrected unless otherwise noted in the general set comments above. This test report shall not be reproduced, except in full, without written approval of Columbia Basin Analytical Laboratories.

I certify that this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the Laboratory Director or a designee as verified by the following signature.

11/04/16

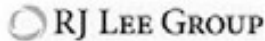
Scientist II DeNomy Dage

If you have any questions, please feel free to contact DeNomy Dage at [ddage@rjlg.com](mailto:ddage@rjlg.com) or at 509-545-4989.

This report has been reviewed and approved by the following individual:

11/21/16

Office Manager JJ Furlong



Carl Howald IV  
 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352  
 Client Project:  
 Cartridge Evaluation

**Laboratory Report**  
 NIOSH 2522  
 Air/Emissions on GC/TEA Analyzer  
 Summary Table

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

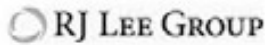
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08635-12-EFF-E   S16T033481	W609129-01	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08635-12-EFF-F   S16T033482	W609129-02	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	

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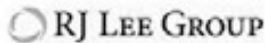
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16-08635-12-EFF-G   S16T033483	W609129-03	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-EFF-H   S16T033484	W609129-04	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022			

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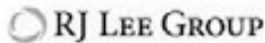
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/lube	RL	Qualifiers
16-06635-12-IN-A   S16T033485	W609129-05	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.173	0.021	
		09/23/16	10/21/16	N-Nitrosodimethylamine	2.998	0.281	D
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.025	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	0.041	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-06635-12-IN-B   S16T033485	W609129-05	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	3.008	0.281	D
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.259	0.021	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.030	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	0.041	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08635-12-IN-C   516T033487	W609129-07	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.202	0.021	
		09/23/16	10/21/16	N-Nitrosodimethylamine	3.037	0.281	D
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.032	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	0.036	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08635-12-IN-D   516T033489	W609129-08	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	3.207	0.281	D
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.159	0.021	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.031	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	0.033	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	

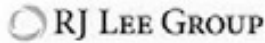
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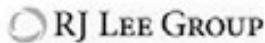
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16-08635-12-BASE-EFF   S16T033490	W609129-09	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-BASE-IN   S16T033491	W609129-10	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-BLANK1   S16T033492	W609129-11	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022			

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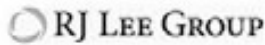
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16-08635-12-BLANK2   S16T033493	W609129-12	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-EFF-A   S16T033494	W609129-13	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-EFF-B   S16T033495	W609129-14	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022			

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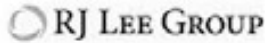
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		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
16-08635-12-EFF-D   S16T033497	W609129-16	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosodimethylamine	<0.017	0.017	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022			

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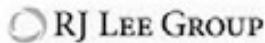
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16-08635-12-IN-E   S16T033498	W609129-17	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	2.814	0.281	D
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.190	0.021	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.031	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	0.032	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08635-12-IN-F   S16T033499	W609129-18	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.132	0.021	
		09/23/16	10/22/16	N-Nitrosodimethylamine	2.958	0.281	D
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.029	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	

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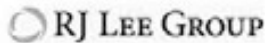
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		09/23/16	10/21/16	N-Nitrosodimethylamine	0.112	0.021	
		09/23/16	10/22/16	N-Nitrosodimethylamine	2.783	0.281	D
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.032	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08635-12-IN-H   516T033501	W609129-20	09/23/16	10/18/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/22/16	N-Nitrosodimethylamine	2.666	0.281	D
		09/23/16	10/21/16	N-Nitrosodimethylamine	0.128	0.021	
		09/23/16	10/18/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosodi-n-propylamine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosomethylethylamine	0.025	0.022	
		09/23/16	10/18/16	N-Nitrosomorpholine	<0.022	0.022	
		09/23/16	10/18/16	N-Nitrosopiperidine	<0.023	0.023	
		09/23/16	10/18/16	N-Nitrosopyrrolidine	<0.022	0.022	

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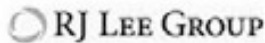
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		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-BASE-IN   S16T033503	W609129-22	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-BLANK-EFF   S16T033504	W609129-23	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

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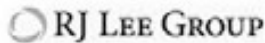
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		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-EFF-A   S16T033506	W609129-25	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-EFF-B   S16T033507	W609129-26	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
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		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-EFF-D   S16T033509	W609129-28	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-EFF-E   S16T033510	W609129-29	09/23/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/23/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/23/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

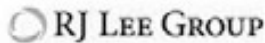
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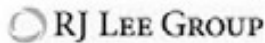
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		09/24/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022			
16-08636-12-EFF-G   S16T033512	W609129-31	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022			
16-08636-12-EFF-H   S16T033513	W609129-32	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/19/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022			

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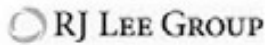
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		09/24/16	10/22/16	N-Nitrosodimethylamine	2.904	0.280	D
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.134	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	*
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.028	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.037	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022			
16-08636-12-IN-B   S16T033515	W609129-34	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.065	0.021	
		09/24/16	10/22/16	N-Nitrosodimethylamine	1.140	0.224	D
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022			

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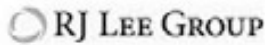
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08636-12-IN-C   516T033516	W609129-35	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/22/16	N-Nitrosodimethylamine	3.249	0.260	D
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.145	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	*
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.035	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.032	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	0.027	0.022	X
16-08636-12-IN-D   516T033517	W609129-36	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/22/16	N-Nitrosodimethylamine	2.837	0.260	D
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.142	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.031	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.031	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

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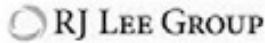
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08636-12-IN-E   S16T033518	W609129-37	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.156	0.021	
		09/24/16	10/22/16	N-Nitrosodimethylamine	3.119	0.280	D
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.035	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.032	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-IN-F   S16T033519	W609129-38	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.143	0.021	
		09/24/16	10/22/16	N-Nitrosodimethylamine	2.548	0.280	D
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.030	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.026	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

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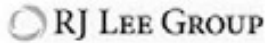
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/lube	RL	Qualifiers
16-08636-12-IN-G   516T033520	W609129-39	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/22/16	N-Nitrosodimethylamine	2.621	0.260	D
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.137	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.030	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	0.024	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	
16-08636-12-IN-H   516T033521	W609129-40	09/24/16	10/19/16	N-Nitrosodiethylamine	<0.022	0.022	
		09/24/16	10/21/16	N-Nitrosodimethylamine	0.143	0.021	
		09/24/16	10/22/16	N-Nitrosodimethylamine	2.513	0.260	D
		09/24/16	10/19/16	N-Nitrosodi-n-butylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosodi-n-propylamine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosomethylethylamine	0.027	0.021	
		09/24/16	10/19/16	N-Nitrosomorpholine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopiperidine	<0.021	0.021	
		09/24/16	10/19/16	N-Nitrosopyrrolidine	<0.022	0.022	

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**Report Qualifiers:**

A = Target Analyte media breakthrough suspect, see analytical report

D = Analyte analyzed in a dilution

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J = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, not 100% or RI match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed but not detected

N/A = Not Applicable

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H = Holding times for preparation or analysis exceeded

L = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

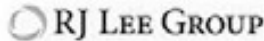
S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

ND = Not Detected

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 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosodiethylamine  
 CAS No: 55-18-5

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.022	0.022	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BLANK-EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.022	0.022	

Report Qualifiers

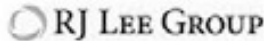
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- Q = Result out of method specific acceptance QC criteria
- R = RPD (relative percent difference) outside accepted recovery limits
- S = Spike Recovery outside accepted recovery limits
- U = Analyte analyzed for but not detected
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- N/A = Not Applicable
- ND = Not Detected

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Report Template: WRPS\_Nitrosamines 2.1.rpt

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 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project: Cartridge Evaluation  
 Analyte: N-Nitrosodiethylamine  
 CAS No.: 55-18-5

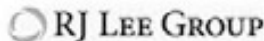
Sample Identification	Sampling Date	Analyzed Date	Result	RL	Qualifiers
Client Sample ID	RJLG		µg/tube	µg/tube	
16-08636-12-EFF-G   S16T03351   W609129-31	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-H   S16T03351   W609129-32	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-A   S16T033514   W609129-33	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-B   S16T033515   W609129-34	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-C   S16T033516   W609129-35	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-D   S16T033517   W609129-36	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-E   S16T033518   W609129-37	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-F   S16T033519   W609129-38	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-G   S16T033520   W609129-39	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-H   S16T033521   W609129-40	09/24/16	10/19/16	<0.022	0.022	

*Report Qualifiers:*  
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 B = Analyte detected in the associated blank  
 D = Analyte analyzed in a dilution  
 E = Result concentration was above the instrument calibration range  
 F = Data that exceeds the RSD criteria set by the SOP  
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 L = Sample condition at receipt out of compliance with method defined conditions  
 P = Library spectrum match, not >80% or RT match  
 Q = Result out of method specific acceptance QC criteria  
 R = RPD (relative percent difference) outside accepted recovery limits  
 S = Spike Recovery outside accepted recovery limits  
 U = Analyte analyzed for but not detected  
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Richland, WA 99352

## Laboratory Report

NIOSH 2522

RJ Lee Group No: W609129  
Samples Received: 09/27/16  
Report Date: 11/21/16  
COC No.: 20162968  
Extraction Date: 09/30/16

Client Project:  
Cartridge Evaluation

Analyte: N-Nitrosodimethylamine

CAS No: 62-75-9

Sample Identification			Sampling Date	Analyzed Date	Result µg/tube	RL µg/tube	Qualifiers
Client Sample ID	RJLG						
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/21/16	0.173	0.021	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/21/16	3.00	0.281	D
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/21/16	0.259	0.021	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/21/16	3.01	0.281	D
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/21/16	3.04	0.281	D
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/21/16	0.202	0.021	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/21/16	0.159	0.021	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/21/16	3.29	0.281	D
16-08635-12-BASE-EFF	S16T033490	W609129-09	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-BASE-IN	S16T033490	W609129-10	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-BLANK1	S16T033491	W609129-11	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-BLANK2	S16T033492	W609129-12	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-A	S16T033493	W609129-13	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-B	S16T033494	W609129-14	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-C	S16T033495	W609129-15	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-EFF-D	S16T033496	W609129-16	09/23/16	10/18/16	<0.017	0.017	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/21/16	2.81	0.281	D
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/21/16	0.180	0.021	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/22/16	2.96	0.281	D
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/21/16	0.132	0.021	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/22/16	2.78	0.281	D
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/21/16	0.112	0.021	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/22/16	2.67	0.281	D
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/21/16	0.128	0.021	
16-08636-12-BASE-EFF	S16T033502	W609129-21	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BASE-IN	S16T033503	W609129-22	09/23/16	10/19/16	<0.022	0.022	

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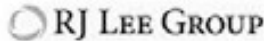
ND = Not Detected

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 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosodimethylamine  
 CAS No.: 62-75-9

Sample Identification			Sampling Date	Analyzed Date	Result µg/tube	RL µg/tube	Qualifiers
Client Sample ID	RJLG						
16-08636-12-BLANK-EFF	S16T1	W609129-23	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/21/16	0.134	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/22/16	2.90	0.280	D
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/21/16	0.065	0.021	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/22/16	1.14	0.224	D
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/22/16	3.25	0.280	D
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/21/16	0.145	0.021	
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/22/16	2.84	0.280	D
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/21/16	0.142	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/22/16	3.12	0.280	D
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/21/16	0.156	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/21/16	0.143	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/22/16	2.55	0.280	D
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/21/16	0.137	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/22/16	2.62	0.280	D
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/21/16	0.143	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/22/16	2.51	0.280	D

Report Qualifiers:

A = Target Analyte media breakthrough suspect, see analytical report

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Z = Not EPA accredited analyte

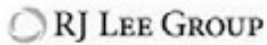
ND = Not Detected

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Report Template: WRPS\_Nitrosamines 2.1.rpt

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 Report Time Stamp: 11/21/16 17:34



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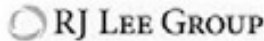
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Carl Howald IV  
 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
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**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosodi-n-butylamine  
 CAS No: 924-16-3

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.023	0.023	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK.EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.021	0.021	

Report Qualifiers

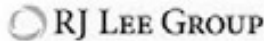
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 CAS No.: 924-16-3

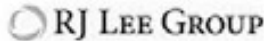
Sample Identification			Sampling Date	Analyzed Date	Result µg/tube	RL µg/tube	Qualifiers
Client Sample ID	RJLG						
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	<0.021	0.021	*
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	<0.021	0.021	*
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	<0.021	0.021	

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 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosodi-n-propylamine  
 CAS No: 621-61-7

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.022	0.022	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK.EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.021	0.021	

Report Qualifiers:

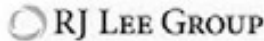
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 Cartridge Evaluation

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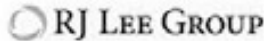
Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	<0.021	0.021	

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- ND = Not Detected

Scientist II DeNomy Dage

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 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosomethylethylamine  
 CAS No: 10595-95-6

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	0.025	0.022	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	0.030	0.022	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	0.032	0.022	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	0.031	0.022	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	0.031	0.022	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	0.029	0.022	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	0.032	0.022	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	0.025	0.022	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK.EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.021	0.021	

Report Qualifiers:

- A = Target Analyte media breakthrough suspect, see analytical report
- B = Analyte detected in the associated blank
- D = Analyte analyzed in a dilution
- d = Data that exceeds the MSD criteria set by the SOP
- E = Report concentration was above the instrument calibration range
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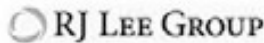
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Report Template: WRPS\_Nitrosamines 2.1.rpt

Approved: 11/4/16 19:26  
 Report Time Stamp: 11/21/16 17:34





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 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosomethylethylamine  
 CAS No.: 10595-95-6

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	0.028	0.021	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	0.035	0.021	
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	0.031	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	0.035	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	0.030	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	0.030	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	0.027	0.021	

Report Qualifiers:

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F = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, not >90% or RT match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

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Q = Result out of method specific acceptance QC criteria

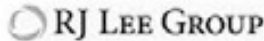
S = Spike Recovery outside accepted recovery limits

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**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project: Cartridge Evaluation  
 Analyte: N-Nitrosomorpholine  
 CAS No.: 59-89-2

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	0.041	0.022	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	0.041	0.022	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	0.036	0.022	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	0.033	0.022	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	0.032	0.022	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.022	0.022	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.021	0.021	

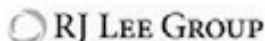
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Report Template: WRPS\_Nitrosamines 2.1.rpt

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Richland, WA 99352

## Laboratory Report

NIOSH 2522

RJ Lee Group No.: W609129  
Samples Received: 09/27/16  
Report Date: 11/21/16  
COC No.: 20162968  
Extraction Date: 09/30/16

Client Project:  
Cartridge Evaluation

Analyte: N-Nitrosomorpholine  
CAS No.: 89-89-2

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	0.037	0.021	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	0.032	0.021	
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	0.031	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	0.032	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	0.026	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	0.024	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	<0.021	0.021	

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## Laboratory Report

NIOSH 2522

RJ Lee Group No: W609129  
Samples Received: 09/27/16  
Report Date: 11/21/16  
COC No.: 20162968  
Extraction Date: 09/30/16

Client Project:  
Cartridge Evaluation

Analyte: N-Nitrosopiperidine

CAS No: 100-75-4

Sample Identification			Sampling Date	Analyzed Date	Result $\mu\text{g}/\text{tube}$	RL $\mu\text{g}/\text{tube}$	Qualifiers
Client Sample ID	RJLG						
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.023	0.023	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.023	0.023	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK.EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.021	0.021	

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S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

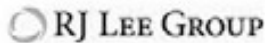
ND = Not Detected

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Report Template: WRPS\_Nitrosamines 2.1.rpt

Approved: 11/4/16 19:26  
Report Time Stamp: 11/21/16 17:34



Carl Howald IV  
Washington River Protection  
Solutions, LLC  
P.O. Box 850 MSIN H6-16  
Richland, WA 99352

## Laboratory Report

NIOSH 2522

RJ Lee Group No.: W609129  
Samples Received: 09/27/16  
Report Date: 11/21/16  
COC No.: 20162968  
Extraction Date: 09/30/16

Client Project:  
Cartridge Evaluation

Analyte: N-Nitrosopiperidine  
CAS No.: 100-75-4

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	<0.021	0.021	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	<0.021	0.021	

**Report Qualifiers:**

A = Target Analyte media breakthrough suspect, see analytical report

D = Analyte analyzed in a dilution

E = Report concentration was above the instrument calibration range

F = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, not >90% or RT match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

H = Holding times for preparation or analysis exceeded

L = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

ND = Not Detected

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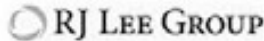
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Carl Howald IV  
 Washington River Protection  
 Solutions, LLC  
 P.O. Box 850 MSIN H6-16  
 Richland, WA 99352

**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte: N-Nitrosopyrrolidine  
 CAS No: 930-55-2

Sample Identification			Sampling	Analyzed	Result	RL	Qualifiers
Client Sample ID	RJLG		Date	Date	µg/tube	µg/tube	
16-08635-12-EFF-E	S16T03348	W609129-01	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-F	S16T03348	W609129-02	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-G	S16T03348	W609129-03	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-H	S16T03348	W609129-04	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-A	S16T033485	W609129-05	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-B	S16T033486	W609129-06	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-C	S16T033487	W609129-07	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-D	S16T033489	W609129-08	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-EFF	S16T03	W609129-09	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BASE-IN	S16T033	W609129-10	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK1	S16T033	W609129-11	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-BLANK2	S16T033	W609129-12	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-A	S16T03349	W609129-13	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-B	S16T03349	W609129-14	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-C	S16T03349	W609129-15	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-EFF-D	S16T03349	W609129-16	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-E	S16T033498	W609129-17	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-F	S16T033499	W609129-18	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-G	S16T033500	W609129-19	09/23/16	10/18/16	<0.022	0.022	
16-08635-12-IN-H	S16T033501	W609129-20	09/23/16	10/18/16	<0.022	0.022	
16-08636-12-BASE-EFF	S16T03	W609129-21	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BASE-IN	S16T033	W609129-22	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BLANK-EFF	S16T03	W609129-23	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-BLANK-IN	S16T03	W609129-24	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-A	S16T03350	W609129-25	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-B	S16T03350	W609129-26	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-C	S16T03350	W609129-27	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-D	S16T03350	W609129-28	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-E	S16T03351	W609129-29	09/23/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-F	S16T03351	W609129-30	09/24/16	10/19/16	<0.022	0.022	

Report Qualifiers

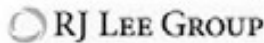
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**Laboratory Report**  
 NIOSH 2522

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

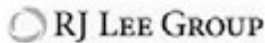
Client Project: Cartridge Evaluation  
 Analyte: N-Nitrosopyrrolidine  
 CAS No.: 930-85-2

Sample Identification			Sampling Date	Analyzed Date	Result µg/tube	RL µg/tube	Qualifiers
Client Sample ID	RJLG						
16-08636-12-EFF-G	S16T03351	W609129-31	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-EFF-H	S16T03351	W609129-32	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-A	S16T033514	W609129-33	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-B	S16T033515	W609129-34	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-C	S16T033516	W609129-35	09/24/16	10/19/16	0.027	0.022	X
16-08636-12-IN-D	S16T033517	W609129-36	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-E	S16T033518	W609129-37	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-F	S16T033519	W609129-38	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-G	S16T033520	W609129-39	09/24/16	10/19/16	<0.022	0.022	
16-08636-12-IN-H	S16T033521	W609129-40	09/24/16	10/19/16	<0.022	0.022	

*Report Qualifiers:*  
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 B = Analyte detected in the associated blank  
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 K = Result out of method specific acceptance QC criteria  
 L = Spike Recovery outside accepted recovery limits  
 M = Analyte analyzed for but not detected  
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 Richland, WA 99352

### Quality Control

NIOSH 2522

RJ Lee Group No.: W609129  
 Samples Received: 09/27/16  
 Report Date: 11/21/16  
 COC No.: 20162968  
 Extraction Date: 09/30/16

Client Project:  
 Cartridge Evaluation

Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	LCS-1	10/18/16	0.200	0.186	0.90	0.207	103	4.32	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/18/16	0.200	0.190	0.92	0.208	103	3.52	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/21/16	0.200	0.192	0.95	0.201	100	1.23	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/21/16	0.200	0.201	1.02	0.196	97.8	2.42	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/21/16	0.200	0.190	0.93	0.205	102	3.37	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/22/16	0.200	0.197	0.97	0.203	101	1.22	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/18/16	0.200	0.177	0.84	0.212	106	5.71	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/18/16	0.200	0.189	0.92	0.206	103	2.50	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/21/16	0.200	0.191	0.96	0.200	99.5	1.84	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/21/16	0.200	0.191	0.99	0.193	96.6	3.30	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/21/16	0.200	0.184	0.89	0.207	103	3.95	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/22/16	0.200	0.182	0.89	0.204	102	2.99	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/18/16	0.200	0.180	0.89	0.203	101	1.79	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/18/16	0.200	0.190	0.95	0.201	100	0.265	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/21/16	0.200	0.190	0.95	0.201	100	0.279	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/21/16	0.200	0.201	1.03	0.194	97.3	2.48	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/21/16	0.200	0.183	0.92	0.199	99.7	1.10	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/22/16	0.200	0.197	0.97	0.203	102	2.43	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/18/16	0.200	0.188	0.91	0.207	103	3.50	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/18/16	0.200	0.185	0.96	0.203	101	1.44	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/21/16	0.200	0.195	0.97	0.202	101	0.969	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/21/16	0.200	0.202	1.04	0.194	97.0	2.96	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/21/16	0.200	0.191	0.94	0.202	101	3.56	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/22/16	0.200	0.199	0.97	0.204	102	2.01	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/18/16	0.200	0.187	0.89	0.210	105	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/18/16	0.200	0.193	0.94	0.206	102	2.00	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/21/16	0.200	0.199	0.98	0.203	101	1.29	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/21/16	0.200	0.201	1.03	0.195	97.4	2.87	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/21/16	0.200	0.187	0.93	0.200	100	3.43	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/22/16	0.200	0.198	0.97	0.203	101	1.33	
N-Nitrosomorpholine	59-89-2	LCS-1	10/18/16	0.200	0.192	0.91	0.211	105	5.55	
N-Nitrosomorpholine	59-89-2	LCS-1	10/18/16	0.200	0.197	0.97	0.203	101	1.34	

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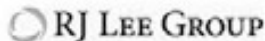
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	LCS-1	10/21/16	0.200	0.195	0.97	0.201	100	1.16	
N-Nitrosomorpholine	59-89-2	LCS-1	10/21/16	0.200	0.199	1.04	0.192	95.9	4.13	
N-Nitrosomorpholine	59-89-2	LCS-1	10/21/16	0.200	0.186	0.93	0.201	101	3.51	
N-Nitrosomorpholine	59-89-2	LCS-1	10/22/16	0.200	0.195	0.97	0.202	101	0.798	
N-Nitrosopiperidine	100-75-4	LCS-1	10/18/16	0.200	0.182	0.88	0.206	103	3.79	
N-Nitrosopiperidine	100-75-4	LCS-1	10/18/16	0.200	0.194	0.95	0.205	102	2.27	
N-Nitrosopiperidine	100-75-4	LCS-1	10/21/16	0.200	0.195	0.97	0.202	101	0.908	
N-Nitrosopiperidine	100-75-4	LCS-1	10/21/16	0.200	0.199	1.04	0.191	95.6	3.96	
N-Nitrosopiperidine	100-75-4	LCS-1	10/21/16	0.200	0.185	0.93	0.199	99.8	2.84	
N-Nitrosopiperidine	100-75-4	LCS-1	10/22/16	0.200	0.195	0.96	0.204	102	1.61	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/18/16	0.200	0.191	0.90	0.212	106	6.40	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/18/16	0.200	0.190	0.92	0.207	103	3.22	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/21/16	0.200	0.195	0.99	0.196	98.2	2.62	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/21/16	0.200	0.199	1.04	0.192	95.6	3.97	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/21/16	0.200	0.187	0.92	0.203	102	2.82	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/22/16	0.200	0.193	0.96	0.202	101	1.07	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/18/16	0.200	0.182	0.90	0.203	101	4.32	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/18/16	0.200	0.184	0.92	0.201	100	3.52	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/21/16	0.200	0.193	0.95	0.202	101	1.23	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/21/16	0.200	0.204	1.02	0.199	99.8	2.42	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/21/16	0.200	0.189	0.93	0.204	102	3.37	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/22/16	0.200	0.194	0.97	0.200	99.7	1.22	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/18/16	0.200	0.167	0.84	0.200	99.5	5.71	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/18/16	0.200	0.161	0.92	0.198	98.6	2.50	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/21/16	0.200	0.196	0.96	0.205	102	1.84	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/21/16	0.200	0.198	0.99	0.200	100	3.30	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/21/16	0.200	0.180	0.89	0.202	101	3.95	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/22/16	0.200	0.173	0.89	0.194	96.6	2.99	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/18/16	0.200	0.179	0.89	0.202	101	1.79	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/18/16	0.200	0.189	0.95	0.200	99.8	0.265	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/21/16	0.200	0.189	0.95	0.200	99.8	0.279	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/21/16	0.200	0.208	1.03	0.201	101	2.48	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/21/16	0.200	0.186	0.92	0.203	101	1.10	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/22/16	0.200	0.196	0.97	0.202	101	2.43	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/18/16	0.200	0.184	0.91	0.202	101	3.50	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/18/16	0.200	0.192	0.96	0.200	100	1.44	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/21/16	0.200	0.194	0.97	0.201	100	0.969	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/21/16	0.200	0.209	1.04	0.201	100.0	2.98	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/21/16	0.200	0.194	0.94	0.205	103	3.56	

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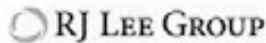
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/22/16	0.200	0.191	0.97	0.196	98.0	2.01	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/18/16	0.200	0.179	0.89	0.201	100	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/18/16	0.200	0.189	0.94	0.200	99.8	2.00	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/21/16	0.200	0.197	0.98	0.201	100	1.29	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/21/16	0.200	0.206	1.03	0.200	99.8	2.87	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/21/16	0.200	0.193	0.93	0.207	103	3.43	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/22/16	0.200	0.193	0.97	0.198	98.8	1.33	
N-Nitrosomorpholine	59-89-2	LCS-2	10/18/16	0.200	0.184	0.91	0.202	101	5.55	
N-Nitrosomorpholine	59-89-2	LCS-2	10/18/16	0.200	0.195	0.97	0.201	100	1.34	
N-Nitrosomorpholine	59-89-2	LCS-2	10/21/16	0.200	0.197	0.97	0.203	101	1.15	
N-Nitrosomorpholine	59-89-2	LCS-2	10/21/16	0.200	0.208	1.04	0.201	100	4.13	
N-Nitrosomorpholine	59-89-2	LCS-2	10/21/16	0.200	0.191	0.93	0.206	103	3.51	
N-Nitrosomorpholine	59-89-2	LCS-2	10/22/16	0.200	0.194	0.97	0.201	100	0.798	
N-Nitrosopiperidine	100-75-4	LCS-2	10/18/16	0.200	0.179	0.88	0.203	101	3.79	
N-Nitrosopiperidine	100-75-4	LCS-2	10/18/16	0.200	0.185	0.95	0.195	97.6	2.27	
N-Nitrosopiperidine	100-75-4	LCS-2	10/21/16	0.200	0.192	0.97	0.199	99.0	0.908	
N-Nitrosopiperidine	100-75-4	LCS-2	10/21/16	0.200	0.211	1.04	0.203	101	3.96	
N-Nitrosopiperidine	100-75-4	LCS-2	10/21/16	0.200	0.192	0.93	0.207	103	2.84	
N-Nitrosopiperidine	100-75-4	LCS-2	10/22/16	0.200	0.192	0.96	0.201	100.0	1.61	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/18/16	0.200	0.181	0.90	0.201	100	6.40	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/18/16	0.200	0.178	0.92	0.194	97.1	3.22	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/21/16	0.200	0.205	0.99	0.206	103	2.62	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/21/16	0.200	0.210	1.04	0.202	101	3.97	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/21/16	0.200	0.187	0.92	0.203	102	2.82	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/22/16	0.200	0.189	0.96	0.198	98.9	1.07	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/18/16	0.200	0.171	0.90	0.190	95.2	4.32	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/18/16	0.200	0.177	0.92	0.193	96.4	3.52	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/21/16	0.200	0.189	0.95	0.198	98.7	1.23	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/21/16	0.200	0.210	1.02	0.205	103	2.42	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/21/16	0.200	0.179	0.93	0.193	96.1	3.37	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/22/16	0.200	0.192	0.97	0.198	98.9	1.22	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/18/16	0.200	0.158	0.84	0.189	94.5	5.71	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/18/16	0.200	0.181	0.92	0.198	98.5	2.50	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/21/16	0.200	0.189	0.96	0.198	98.4	1.84	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/21/16	0.200	0.204	0.99	0.206	103	3.30	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/21/16	0.200	0.170	0.89	0.191	95.6	3.95	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/22/16	0.200	0.182	0.89	0.204	102	2.99	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/18/16	0.200	0.174	0.89	0.196	97.9	1.79	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/18/16	0.200	0.189	0.95	0.200	99.9	0.265	

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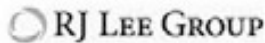
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/21/16	0.200	0.190	0.95	0.201	99.9	0.279	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/21/16	0.200	0.211	1.03	0.204	102	2.48	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/21/16	0.200	0.182	0.92	0.198	99.1	1.10	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/22/16	0.200	0.189	0.97	0.195	97.2	2.43	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/18/16	0.200	0.175	0.91	0.192	96.2	3.50	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/18/16	0.200	0.190	0.96	0.198	98.6	1.44	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/21/16	0.200	0.192	0.97	0.199	98.9	0.969	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/21/16	0.200	0.215	1.04	0.208	103	2.98	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/21/16	0.200	0.182	0.94	0.193	96.0	3.56	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/22/16	0.200	0.195	0.97	0.200	100.0	2.01	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/18/16	0.200	0.170	0.89	0.191	95.0	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/18/16	0.200	0.185	0.94	0.196	98.1	2.00	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/21/16	0.200	0.194	0.98	0.198	98.6	1.29	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/21/16	0.200	0.212	1.03	0.205	103	2.67	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/21/16	0.200	0.180	0.93	0.193	96.6	3.43	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/22/16	0.200	0.195	0.97	0.200	99.7	1.33	
N-Nitrosomorpholine	59-89-2	LCS-3	10/18/16	0.200	0.172	0.91	0.189	94.0	5.55	
N-Nitrosomorpholine	59-89-2	LCS-3	10/18/16	0.200	0.191	0.97	0.197	98.6	1.34	
N-Nitrosomorpholine	59-89-2	LCS-3	10/21/16	0.200	0.192	0.97	0.198	98.7	1.15	
N-Nitrosomorpholine	59-89-2	LCS-3	10/21/16	0.200	0.216	1.04	0.208	104	4.13	
N-Nitrosomorpholine	59-89-2	LCS-3	10/21/16	0.200	0.178	0.93	0.192	96.3	3.51	
N-Nitrosomorpholine	59-89-2	LCS-3	10/22/16	0.200	0.192	0.97	0.199	99.1	0.798	
N-Nitrosopiperidine	100-75-4	LCS-3	10/18/16	0.200	0.169	0.88	0.191	95.7	3.79	
N-Nitrosopiperidine	100-75-4	LCS-3	10/18/16	0.200	0.190	0.95	0.200	100	2.27	
N-Nitrosopiperidine	100-75-4	LCS-3	10/21/16	0.200	0.194	0.97	0.201	100	0.908	
N-Nitrosopiperidine	100-75-4	LCS-3	10/21/16	0.200	0.215	1.04	0.207	103	3.96	
N-Nitrosopiperidine	100-75-4	LCS-3	10/21/16	0.200	0.181	0.93	0.195	97.4	2.84	
N-Nitrosopiperidine	100-75-4	LCS-3	10/22/16	0.200	0.189	0.96	0.197	98.4	1.61	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/18/16	0.200	0.168	0.90	0.187	93.4	6.40	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/18/16	0.200	0.182	0.92	0.199	99.4	3.22	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/21/16	0.200	0.197	0.99	0.198	98.9	2.62	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/21/16	0.200	0.215	1.04	0.207	103	3.97	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/21/16	0.200	0.178	0.92	0.193	96.7	2.82	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/22/16	0.200	0.192	0.96	0.201	100	1.07	
N-Nitrosodiethylamine	55-18-5	MB	10/18/16		0.00	0.90	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/19/16		0.00	0.92	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/21/16		0.00	0.95	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/21/16		0.00	1.02	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/21/16		0.00	0.93	0.00			

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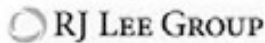
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	MB	10/22/16		0.00	0.97	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/18/16		0.00	0.84	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/19/16		0.00	0.92	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/21/16		0.00	0.96	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/21/16		0.00	0.99	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/21/16		0.00	0.89	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/22/16		0.00	0.89	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/18/16		0.00	0.89	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/19/16		0.00	0.95	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/21/16		0.00	0.95	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/21/16		0.00	1.03	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/21/16		0.00	0.92	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/22/16		0.00	0.97	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/18/16		0.00	0.91	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/19/16		0.00	0.96	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/21/16		0.00	0.97	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/21/16		0.00	1.04	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/21/16		0.00	0.94	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/22/16		0.00	0.97	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/18/16		0.00	0.89	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/19/16		0.00	0.94	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/21/16		0.00	0.98	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/21/16		0.00	1.03	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/21/16		0.00	0.93	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/22/16		0.00	0.97	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/18/16		0.00	0.91	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/19/16		0.00	0.97	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/21/16		0.00	0.97	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/21/16		0.00	1.04	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/21/16		0.00	0.93	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/22/16		0.00	0.97	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/18/16		0.00	0.88	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/19/16		0.00	0.95	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/21/16		0.00	0.97	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/21/16		0.00	1.04	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/21/16		0.00	0.93	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/22/16		0.00	0.96	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/18/16		0.00	0.90	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/19/16		0.00	0.92	0.00			

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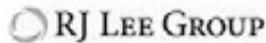
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MB	10/21/16		0.00	0.99	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/21/16		0.00	1.04	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/21/16		0.00	0.92	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/22/16		0.00	0.96	0.00			
N-Nitrosodiethylamine	55-18-5	MRL	10/18/16	0.020	0.020	0.90	0.022	109		
N-Nitrosodiethylamine	55-18-5	MRL	10/18/16	0.020	0.018	0.92	0.020	101		
N-Nitrosodiethylamine	55-18-5	MRL	10/21/16	0.020	0.017	0.95	0.018	91.8		
N-Nitrosodiethylamine	55-18-5	MRL	10/21/16	0.020	0.019	1.02	0.019	93.5		
N-Nitrosodiethylamine	55-18-5	MRL	10/21/16	0.020	0.022	0.93	0.024	119		
N-Nitrosodiethylamine	55-18-5	MRL	10/22/16	0.020	0.022	0.97	0.023	112		
N-Nitrosodimethylamine	62-75-9	MRL	10/18/16	0.020	0.022	0.84	0.026	132		
N-Nitrosodimethylamine	62-75-9	MRL	10/18/16	0.020	0.023	0.92	0.025	126		
N-Nitrosodimethylamine	62-75-9	MRL	10/21/16	0.020	0.017	0.96	0.018	92.2		
N-Nitrosodimethylamine	62-75-9	MRL	10/21/16	0.020	0.022	0.99	0.022	112		
N-Nitrosodimethylamine	62-75-9	MRL	10/21/16	0.020	0.021	0.89	0.024	119		
N-Nitrosodimethylamine	62-75-9	MRL	10/22/16	0.020	0.021	0.89	0.024	118		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/18/16	0.020	0.020	0.89	0.023	115		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/18/16	0.020	0.022	0.95	0.023	117		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/21/16	0.020	0.019	0.95	0.020	101		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/21/16	0.020	0.020	1.03	0.019	93.7		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/21/16	0.020	0.020	0.92	0.022	112		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/22/16	0.020	0.020	0.97	0.021	105		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/18/16	0.020	0.020	0.91	0.022	109		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/18/16	0.020	0.020	0.96	0.021	107		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/21/16	0.020	0.018	0.97	0.019	93.3		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/21/16	0.020	0.018	1.04	0.017	83.3		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/21/16	0.020	0.022	0.94	0.023	114		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/22/16	0.020	0.019	0.97	0.020	99.7		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/18/16	0.020	0.021	0.89	0.024	120		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/18/16	0.020	0.021	0.94	0.022	108		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/21/16	0.020	0.018	0.98	0.018	87.6		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/21/16	0.020	0.019	1.03	0.018	92.3		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/21/16	0.020	0.022	0.93	0.024	118		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/22/16	0.020	0.022	0.97	0.023	113		
N-Nitrosomorpholine	59-89-2	MRL	10/18/16	0.020	0.022	0.91	0.024	122		
N-Nitrosomorpholine	59-89-2	MRL	10/18/16	0.020	0.021	0.97	0.022	109		
N-Nitrosomorpholine	59-89-2	MRL	10/21/16	0.020	0.017	0.97	0.018	87.7		
N-Nitrosomorpholine	59-89-2	MRL	10/21/16	0.020	0.020	1.04	0.019	94.7		
N-Nitrosomorpholine	59-89-2	MRL	10/21/16	0.020	0.022	0.93	0.024	120		

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco WA 99301 | 509.545.4989

WWW.RJLEEGROUP.COM

Report Template: WRPS\_Nitrosamines 2.1.rpt

Approved: 11/4/16 19:26  
Report Time Stamp: 11/21/16 17:34



Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	MRL	10/22/16	0.020	0.021	0.97	0.022	111		
N-Nitrosopiperidine	100-75-4	MRL	10/18/16	0.020	0.018	0.88	0.020	102		
N-Nitrosopiperidine	100-75-4	MRL	10/18/16	0.020	0.024	0.95	0.025	123		
N-Nitrosopiperidine	100-75-4	MRL	10/21/16	0.020	0.019	0.97	0.020	97.9		
N-Nitrosopiperidine	100-75-4	MRL	10/21/16	0.020	0.019	1.04	0.018	89.6		
N-Nitrosopiperidine	100-75-4	MRL	10/21/16	0.020	0.020	0.93	0.022	108		
N-Nitrosopiperidine	100-75-4	MRL	10/22/16	0.020	0.022	0.96	0.023	114		
N-Nitrosopyrrolidine	930-55-2	MRL	10/18/16	0.020	0.021	0.90	0.023	114		
N-Nitrosopyrrolidine	930-55-2	MRL	10/18/16	0.020	0.021	0.92	0.023	115		
N-Nitrosopyrrolidine	930-55-2	MRL	10/21/16	0.020	0.018	0.99	0.018	92.2		
N-Nitrosopyrrolidine	930-55-2	MRL	10/21/16	0.020	0.020	1.04	0.019	93.0		
N-Nitrosopyrrolidine	930-55-2	MRL	10/21/16	0.020	0.021	0.92	0.023	113		
N-Nitrosopyrrolidine	930-55-2	MRL	10/22/16	0.020	0.021	0.96	0.022	110		

**Report Qualifiers:**

A = Target Analyte media breakthrough suspect, see analytical report

D = Analyte analyzed in a dilution

E = Report concentration was above the instrument calibration range

J = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, >= 90% or R<sub>T</sub> match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

H = Holding times for preparation or analysis exceeded

I = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

ND = Not Detected

Scientist II DeNomy Dage

*These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitations of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples received by this report, RJ Lee Group will store the samples for a period of ninety (90) days before discarding. A shipping and handling fee will be assessed for the return of any samples. Unless otherwise noted, samples were received in an acceptable condition. This laboratory operates in accordance with ISO 17025 guidelines, and holds limited scopes of accreditation under C022, AP Lab Code 4061 AINA LAP, LLC Lab ID 170658 EPA ID WA0185 and WA DOE Lab ID C268. This report may not be used to claim product endorsement by any laboratory accrediting agency. The results contained in this report relate only to the items listed or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be valid.*

Assembled		C.O.C. No. 20162968						
N/A		Page 1 of 4						
Collector		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						
SAF No.	Contract/Requestor	Telephone No.	MSRN					
N/A	ONL, HANCOCK TV	773-6461	6-05 FAX 312-1878					
Project Title	Sample Origin	Purchase Order/Charge Code	Temp.					
CHARITABLE EVALUATION	CHARITABLE EVALUATION	20300/0300	21.0					
Shipped To (Lab)	Logbook/Work Package No.	Ice Chest No.	Bill of Lading/Air Bill No.					
CML	N/A	N/A	N/A					
Freeze/cool	Method of Shipment	Data Turnaround						
N/A	10 2016	10 2016						
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative		
	8167033483	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033482	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033483	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033484	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033485	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033486	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033487	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033489	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033490	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
	8167033491	VA	9/23/16	Thermosorb-N	STEROSAMINES 16-08635-12-BSE-E	N/A		
<p>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>SPECIAL INSTRUCTIONS</p> <p>Send Results to Carl Rowald IV &amp; Greg Scanlan Carl.R.Rowald@fl.gov and gregory_l_scanlan@fl.gov see SOW for email.</p>								
Retransquished by	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Marker*
Sharon Kildner	M. Kildner	9-21-16	09:30	Re Roaece	S. S. S. S.	9-22-16	09:30	S = Soil DL = Drain Liquids SE = Sediment T = Tissue SO = Solid WM = Waste SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor DS = Drain Solids X = Other
Retransquished by	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Marker*
Re Roaece	S. S. S. S.	9-22-16	13:30	Re Roaece	S. S. S. S.	9-22-16	17:30	
Retransquished by	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Marker*
FINAL SAMPLE DISPOSITION		Disposed by		Date/Time		Marker*		
CONSUMED		Dennis Smith		11/02/16		10:15		

All samples containing hazardous materials shall be picked up by requester and returned to parent container or site of origin.

A-6003-982 (03/05)

Assembler		C.O.C. No.					
R/A		20162968					
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							
Collector		Contact/Requestor					
Jones		Cec. Howell 19					
SACF No.		Sample Origin					
R/A		CHARLOTTE EVALUATION					
Project Title		Logbook Work Package No.					
CAPABILITY EVALUATION		R/A					
Shipped (to Lab)		Method of Shipment					
R/A		Data Turnaround					
R/A		10 Days					
Sample No.		Lab ID	Date	Time	No. Type Container	Sample Analysis	Preservative
	8167033492	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BLANK 1 -	N/A
	8167033493	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BLANK 2 / -	N/A
	8167033494	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BFP-A * -	N/A
	8167033495	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BFP-B * -	N/A
	8167033496	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BFP-C * -	N/A
	8167033497	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BFP-D * -	N/A
	8167033498	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BR-E * -	N/A
	8167033499	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BR-F / -	N/A
	8167033500	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BR-G 1 -	N/A
	8167033501	VA	9/23/16		Thermosorb-N	Nitrosamines 16-08635-12-BR-H 1 -	N/A
<b>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)</b> MSOS <input type="radio"/> Yes <input checked="" type="radio"/> No							<b>SPECIAL INSTRUCTIONS</b> Send Results to Carl Howell IV & Greg Carl K Howald@crl.gov and Greg@ky_s_scientific.gov see SCF for email.
<b>Requester</b> Requested By: <i>Shawn Walker</i> <i>Mark</i> <i>9/23/16 09:30</i> Received By: <i>RE ROGERS</i> <i>9/27/16 09:30</i> Date/Time:		<b>Print</b> <i>9/27/16 09:30</i> Received By: <i>RE ROGERS</i> <i>9/27/16 09:30</i> Received By: <i>Amber Kestrough</i> <i>9/27/16 11:28</i> Date/Time:		<b>Disposition</b> Disposed By: <i>Doree Smith</i> <i>9/25</i> Date/Time:		<b>Matrix</b> S = Soil DL = Durn Liquids SE = Sediment T = Tissue SO = Solid WI = Waste SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other OS = Durn Solids	
<b>Requester</b> Requested By: <i>RE ROGERS</i> <i>9/23/16 19:30</i> Received By: <i>Amber Kestrough</i> <i>9/27/16 11:28</i> Date/Time:		<b>Print</b> <i>9/27/16 09:30</i> Received By: <i>RE ROGERS</i> <i>9/27/16 09:30</i> Received By: <i>Amber Kestrough</i> <i>9/27/16 11:28</i> Date/Time:		<b>Disposition</b> Disposed By: <i>Doree Smith</i> <i>9/25</i> Date/Time:		<b>Matrix</b> S = Soil DL = Durn Liquids SE = Sediment T = Tissue SO = Solid WI = Waste SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other OS = Durn Solids	

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.



Assay/Order		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		C.O.C. No.		
N/A				20162968		
				Page 3 of 4		
Collector	Contract/Requestor	Telephone No.	773-6861	MSRN	6-05	
SNR No.	Order No./ID	Purchase Order/Change Code		FAX	372-1878	
N/A	Sample Origin	201603/CR0				
Project Title	CHARITABLE EVALUATION	Ice Chest No.		Temp.	21.1	
Shipped To (Lab)	Method of Shipment	Bill of Lading/air Bill No.				
CAAL	N/A	Parts and Return No.				
Invoice#	Data Turnaround					
N/A	15 DAYS					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	5167033502	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-EFF / -	N/A
	5167033503	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-18 / -	N/A
	5167033504	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-EFF / -	N/A
	5167033505	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-18 / -	N/A
	5167033506	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-A / -	N/A
	5167033507	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-B / -	N/A
	5167033508	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-C / -	N/A
	5167033509	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-D / -	N/A
	5167033510	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-E / -	N/A
	5167033511	VA	9/24/16	Thermosep-N	Nitrosamines 16-08636-12-BA5F-F / -	N/A
<p>POSSIBLE SAMPLE HAZARDOUS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>SPECIAL INSTRUCTIONS</p> <p>Send Results to Carl Rowald IV &amp; Greg                  Special                  Carl Rowald@tri.gov and                  Gregory L_Schmidt@tri.gov see SOC for email</p>						Hold Time
Requested By	Print	Sign	Date/Time	Received By	Print	Date/Time
Sharalinda Mullis			9/27/16 08:50	Re Rogers		9/27/16 09:30
Requested By	Print	Sign	Date/Time	Received By	Print	Date/Time
Re Rogers			9-27-16 12:30	Archer Fairclough		9-27-16 12:34
Requested By	Print	Sign	Date/Time	Received By	Print	Date/Time
Requested By	Date/Time	Received By	Date/Time	Disposed By	Date/Time	Matrix*
				Dennis Smith		DL = Drum Liquids SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids T = Tissue VA = Vapour L = Liquid V = Vegetation VA = Vapor X = Other
Final Sample Disposition: <b>CONSUMED</b>						Date/Time: 11/02/16 10:25

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or sbs of orgs.

A-6003-082 (03/05)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST

C.O.C. No. 20162968  
Page 4 of 4

Collector Sites	Collecting/Requestor	CAIL HEALTH IV	Telephone No.	313-6861	MSN	16-05	FAX	312-1878
SAP No.	Sample Origin	CHARLOTTE EVALUATION	Purchase Order/Change Code	20303/C819				
Project Title	Logbook/Work Package No.	r/w	Temp.	27.3				
CAUTION: EVALUATION	Method of Shipment		Bill of Lading/Air Bill No.					
Shipped To (Lab)	Data Turnaround	10 days	Parts and Return No.					
Protocol								

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
5167033512	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-C	N/A
5167033513	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-E	N/A
5167033514	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-A	N/A
5167033515	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-B	N/A
5167033516	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-C	N/A
5167033517	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-D	N/A
5167033518	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-E	N/A
5167033519	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-F	N/A
5167033520	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-G	N/A
5167033521	VA	9/24/16		Thermosorb-B	Nitrosamines 16-08636-12-18-H	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS  Yes  No

SPECIAL INSTRUCTIONS  
Send Results to Carl Rowald IV & Greg Scanlan Rowald@rl-jer and gregory\_l\_scanlan@rl-jer.com see SCW for email

CONTRACT 55503

Requested by	Part	Sign	Date/Time	Received By	Part	Date/Time	Disposed By	Date/Time	Material
Sheryl Keller			9-21-16 0730	Re Rogers		9-21-16 0930			S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Duan Solids DL = Duan Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other
Re Rogers			9-22-16 1330	Amer Reinhard		9-22-16 1230			

FINAL SAMPLE DISPOSITION **CONSUMED** Disposed by *Danessa Smith* *ASST* Date/Time *11/02/16 10:15*

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6000-962 (03/05)

## **Appendix D**

### **Data Reduction Steps**



## Appendix D

### Data Reduction Steps

1. Only chemicals in the current Chemicals of Potential Concern (COPC) list were included in the calculated data. Nitrous oxide and methanol were not measured in the study. Any other missing COPCs were analyzed as “Tentatively Identified Compounds.”
2. The COPCs are ranked in the order of their COPC number. Within the data section for each COPC, data are ranked in the order of survey (1 and 2). Within every survey, data are ranked in the order of inlet and outlet and following the time sequence.
3. Except for mercury, COPC concentrations were converted into parts per million (ppm) using their molecular weights and corresponding flow rates after volume correction as shown in the following equation:

$$C = 24.25 \frac{r}{MV}$$

where  $C$  is the concentration of COPC in ppmv;  $r$  is the analytical result with units of  $\mu\text{g}/\text{sample}$  (if the analytical result unit is expressed in  $\text{mg}/\text{sample}$ , the value of  $C$  needs to be multiplied by 1000; if the analytical result unit is in  $\text{ng}/\text{sample}$  the value of  $C$  needs to be divided by 1000);  $V$  is the collected volume in 2 hours expressed in liters;  $M$  is the molecular weight of COPC expressed as  $\text{g}/\text{mol}$ . When the ratio between concentration and the corresponding Occupational Exposure Limit (OEL) is larger than 10%, the fraction is shown in red.

4. The reported volume measurements in Appendix C were made via DryCal devices placed downstream of each sample media tube. This allowed for precise volume measurements through each of the tubes. However, to perform the concentration conversion to ppm, the “actual” volumetric values required conversion to standard temperature and pressure conditions.

Ideal gas behavior was assumed for these volume corrections, and standard temperatures and pressures were assumed to be 298 K ( $T_{\text{standard}}$ ) and 760 Torr ( $P_{\text{standard}}$ ), respectively. For temperatures, the reported upstream temperatures for each time period were used ( $T_{\text{upstream}}$ , in Kelvin), and the temperature correction factor (i.e., the factor multiplied by each reported volume) was simply  $T_{\text{standard}}/T_{\text{upstream}}$ .

For the pressure corrections, additional pressure drop information was gathered so that the pressure at the point of the DryCal device could be calculated. Each time step had reported upstream pressures ( $P_{\text{upstream}}$ , or upstream of the respirator cartridges). Therefore, pressure drop measurements across the respirator cartridge and each sample media tube were performed offline to gather the additional information necessary for the correction.

The average reported pressure drop reading for the respirator cartridge ( $P_{\text{cartridge}}$ ) tested was 3.2 inches of water column (WC). The pressure drop measurements across the individual sample tubes are shown in the table below (all expressed as inches of WC).

The average pressure drops were then used in a pressure correction factor for the reported volumes. Note that all pressure values were first converted to units of Torr. For measurements made at the inlet of the respirator cartridge the pressure correction factor is  $(P_{\text{upstream}} - P_{\text{tube}}) \div P_{\text{standard}}$ . For measurements made at the outlet of the respirator cartridge the pressure correction factor is  $(P_{\text{upstream}} - P_{\text{cartridge}} - P_{\text{tube}}) \div P_{\text{standard}}$ .

Tube Location	First Measure (inches of WC, tube on cartridge inlet side)	Second Measure (inches of WC, tube on cartridge outlet side)	Average of Both Measurements ( $P_{\text{tube}}$ , inches of WC)
A	5.0	12.4	8.7
B	6.9	7.2	7.1
C	2.3	2.5	2.4
D	0.8	0.8	0.8
E	1.9	2.1	2.0
F	3.8	6.8	5.3
G	1.6	1.7	1.7
H	7.7	6.5	7.1
I	5.2	4.0	4.6
J	15.9	16.3	16.1
K	10.1	9.7	9.9

An example calculation of the correction factors follows. For a given time period, assume that the reported upstream pressure ( $P_{\text{upstream}}$ ) was 734 Torr and the corresponding temperature ( $T_{\text{upstream}}$ ) was 85.9°F (or 302.9 K). Here, for tube location ‘A’ and upstream of the respirator cartridge, the corresponding temperature correction factor would be 0.984, and the pressure correction factor for the respirator cartridge outlet would be 0.944. When multiplied, these two factors equal 0.929, which would be the overall correction to the reported volume measurement.

5. The analytical detection limit—or reporting limit in some cases—for every COPC was obtained from the raw analytical data. Here, the average flow rate was used to calculate the approximate analytical detection limit as the percentage of the OEL for each COPC. Because the flow rates vary, the calculated concentrations were different for each point, even though some of the results are less than the detection limit (DL) in the original reading. The last column in the tables below indicate if the original readings were less than the DL or not.
  - For ammonia and mercury, only the results obtained from using method of total vapor of ammonia and mercury were used.
  - For furan, results from the furan category instead of volatile organic compound (VOC) (or volatile organic analyte) were used. For acetonitrile, results from the VOC category were used. For butanal, the results from the VOC category instead of the aldehydes category were used. For pyridine and 2,4-dimethylpyridine, the results from the VOC category were used.
  - For N-Nitrosodimethylamine and other nitrosamines, data values above analytical DLs for the same time and position were added together because the original sample was diluted into three samples for measurements. This same rule applies to 1,3-Butadiene. The results in the plots and tables reflect the sum of results.
6. Analytical results frequently have data qualifier flags documented for specific sample analyses. Depending on the data qualifier, specific data may be considered for deletion or removal from the analysis, or results described with appropriate clarifying language to indicate whether there are possible limitations to the data. The following flags were found to be associated with at least one of the COPC compounds analyzed through this effort. Here, key qualifier codes are given, along with their definitions and how they are being handled with the cartridge testing analysis. This list is not inclusive of all flags that the analytical team may assign, but is inclusive of the flags found associated with the data set compiled within this report.

Action	Flag	Flag Description
Retain (Result is treated in the analysis as a valid data point)	J	The "J" flag is applied to results that are considered estimates. Some examples of when a "J" flag are applied include (but are not limited to): <ul style="list-style-type: none"> <li>• Results with concentrations <math>\geq</math> MDL but <math>&lt;</math> the RL. When results are reported based on the RL, the "J" is removed from the reported data. Raw data are left as received from the Chemist.</li> <li>• Unknown constituents—tentatively identified compounds (TIC) or positively identified compounds (PIC).</li> </ul>
	E	The "E" flag is applied to each analyte that exceeded the calibration range of the instrument.
	U	The "U" flag is applied to analytes that were analyzed for, but were not detected, or were detected below the MDL. If results are reported based on RL, this flag is removed from the reported data. Raw data are left as received from the Chemist.
	D	The "D" flag is applied to all analytes in a sample that were diluted prior to analysis.
Retain/Evaluate (Result is treated in the analysis as a valid data point, but evaluated on a case-by-case basis to determine whether clarification is needed in the analysis report to document the uncertainty or potential limitations of the data)	L	The "L" flag is applied to analyte results (both detected and not detected) within a sample batch that included a low level standard (LLS) with a percent recovery for that analyte that was outside the analytical method specified range.
	Y	The "Y" flag is a user-defined flag and is applied to results that require written descriptions or qualifying comments. This flag is used by the Chemist, PC, or other technical authority to identify data that is questionable or may be inaccurate because of interferences, sampling problems, sample collection media (e.g., tubes or summa canisters) certification failures, or instrumentation limitations.
Delete (Result is seriously suspect and should be screened out and not reported)	N/A	

The following tables show the calculated concentrations for each of the COPC measurements conducted in this study. Red highlighted values reflect measurements that were above 10% of the respective OEL values. COPCs with these highlights are plotted and shown in Section 5.0. Orange highlighted values reflect measurements in the 2 to 10% of the OEL range. COPCs with these highlights (only) are plotted and shown in Appendix E.

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
1	Ammonia	2	8635-A1	24.49	25	98.0%		2.49%	
1	Ammonia	4	8635-B1	25.94	25	104%		2.49%	
1	Ammonia	6	8635-C1	25.62	25	102%		2.49%	
1	Ammonia	8	8635-D1	25.44	25	102%		2.49%	
1	Ammonia	10	8635-E1	24.05	25	96.2%		2.49%	
1	Ammonia	12	8635-F1	10.44	25	41.8%		2.49%	
1	Ammonia	14	8635-G1	26.42	25	106%		2.49%	
1	Ammonia	16	8635-H1	25.54	25	102%		2.49%	
1	Ammonia	2	8635-A2	0.58	25	2.32%	YES	2.49%	
1	Ammonia	4	8635-B2	0.60	25	2.40%	YES	2.49%	
1	Ammonia	6	8635-C2	0.62	25	2.47%	YES	2.49%	
1	Ammonia	8	8635-D2	0.62	25	2.49%	YES	2.49%	
1	Ammonia	10	8635-E2	0.62	25	2.47%	YES	2.49%	
1	Ammonia	12	8635-F2	0.62	25	2.48%	YES	2.49%	
1	Ammonia	14	8635-G2	1.08	25	4.32%		2.49%	
1	Ammonia	16	8635-H2	1.83	25	7.31%		2.49%	
1	Ammonia	2	8636-A1	24.45	25	97.8%		2.49%	
1	Ammonia	4	8636-B1	25.91	25	104%		2.49%	
1	Ammonia	6	8636-C1	26.52	25	106%		2.49%	
1	Ammonia	8	8636-D1	23.74	25	94.9%		2.49%	
1	Ammonia	10	8636-E1	25.03	25	100%		2.49%	
1	Ammonia	12	8636-F1	14.06	25	56.2%		2.49%	
1	Ammonia	14	8636-G1	22.38	25	89.5%		2.49%	
1	Ammonia	16	8636-H1	24.51	25	98.1%		2.49%	
1	Ammonia	2	8636-A2	0.62	25	2.48%	YES	2.49%	
1	Ammonia	4	8636-B2	0.54	25	2.16%	YES	2.49%	
1	Ammonia	6	8636-C2	0.56	25	2.24%	YES	2.49%	
1	Ammonia	8	8636-D2	0.61	25	2.45%	YES	2.49%	
1	Ammonia	10	8636-E2	0.88	25	3.51%		2.49%	
1	Ammonia	12	8636-F2	1.60	25	6.41%		2.49%	
1	Ammonia	14	8636-G2	2.60	25	10.4%		2.49%	
1	Ammonia	16	8636-H2	4.15	25	16.6%		2.49%	
3	Mercury	2	8635-A1	0.00021	0.003	6.74%	YES	9.89%	
3	Mercury	4	8635-B1	0.00021	0.003	7.04%	YES	9.89%	
3	Mercury	6	8635-C1	0.00021	0.003	6.99%	YES	9.89%	
3	Mercury	8	8635-D1	0.00021	0.003	6.91%	YES	9.89%	
3	Mercury	10	8635-E1	0.00021	0.003	6.87%	YES	9.89%	
3	Mercury	12	8635-F1	0.00021	0.003	6.75%	YES	9.89%	
3	Mercury	14	8635-G1	0.00022	0.003	7.29%		9.89%	
3	Mercury	16	8635-H1	0.00021	0.003	6.87%	YES	9.89%	
3	Mercury	2	8635-A2	0.00020	0.003	6.69%	YES	9.89%	
3	Mercury	4	8635-B2	0.00021	0.003	6.85%	YES	9.89%	
3	Mercury	6	8635-C2	0.00021	0.003	7.01%	YES	9.89%	
3	Mercury	8	8635-D2	0.00021	0.003	6.88%	YES	9.89%	
3	Mercury	10	8635-E2	0.00022	0.003	7.07%	YES	9.89%	
3	Mercury	12	8635-F2	0.00021	0.003	6.82%	YES	9.89%	
3	Mercury	14	8635-G2	0.00020	0.003	6.72%	YES	9.89%	
3	Mercury	16	8635-H2	0.00021	0.003	6.78%	YES	9.89%	
3	Mercury	2	8636-A1	0.00020	0.003	6.68%	YES	9.89%	
3	Mercury	4	8636-B1	0.00021	0.003	6.96%	YES	9.89%	
3	Mercury	6	8636-C1	0.00020	0.003	6.66%	YES	9.89%	
3	Mercury	8	8636-D1	0.00021	0.003	7.05%	YES	9.89%	
3	Mercury	10	8636-E1	0.00021	0.003	7.01%	YES	9.89%	
3	Mercury	12	8636-F1	0.00022	0.003	7.11%	YES	9.89%	
3	Mercury	14	8636-G1	0.00021	0.003	6.81%	YES	9.89%	
3	Mercury	16	8636-H1	0.00021	0.003	6.78%	YES	9.89%	
3	Mercury	2	8636-A2	0.00021	0.003	6.94%	YES	9.89%	
3	Mercury	4	8636-B2	0.00020	0.003	6.67%	YES	9.89%	
3	Mercury	6	8636-C2	0.00020	0.003	6.67%	YES	9.89%	
3	Mercury	8	8636-D2	0.00021	0.003	6.85%	YES	9.89%	
3	Mercury	10	8636-E2	0.00021	0.003	6.97%	YES	9.89%	
3	Mercury	12	8636-F2	0.00022	0.003	7.17%	YES	9.89%	



COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
3	Mercury	14	8636-G2	0.00021	0.003	6.99%	YES	9.89%	
3	Mercury	16	8636-H2	0.00021	0.003	6.96%	YES	9.89%	
4	1,3-Butadiene	2	8635-A1	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	4	8635-B1	0.019	1	1.94%	YES	2.03%	
4	1,3-Butadiene	6	8635-C1	0.019	1	1.94%	YES	2.03%	
4	1,3-Butadiene	8	8635-D1	0.019	1	1.93%	YES	2.03%	
4	1,3-Butadiene	10	8635-E1	0.020	1	1.95%	YES	2.03%	
4	1,3-Butadiene	12	8635-F1	0.019	1	1.94%	YES	2.03%	
4	1,3-Butadiene	14	8635-G1	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	16	8635-H1	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	2	8635-A2	0.020	1	1.95%	YES	2.03%	
4	1,3-Butadiene	4	8635-B2	0.020	1	1.98%	YES	2.03%	
4	1,3-Butadiene	6	8635-C2	0.019	1	1.95%	YES	2.03%	
4	1,3-Butadiene	8	8635-D2	0.019	1	1.93%	YES	2.03%	
4	1,3-Butadiene	10	8635-E2	0.020	1	1.98%	YES	2.03%	
4	1,3-Butadiene	12	8635-F2	0.020	1	1.95%	YES	2.03%	
4	1,3-Butadiene	14	8635-G2	0.019	1	1.91%	YES	2.03%	
4	1,3-Butadiene	16	8635-H2	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	2	8636-A1	0.019	1	1.94%	YES	2.03%	
4	1,3-Butadiene	4	8636-B1	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	6	8636-C1	0.018	1	1.80%	YES	2.03%	
4	1,3-Butadiene	8	8636-D1	0.020	1	1.97%	YES	2.03%	
4	1,3-Butadiene	10	8636-E1	0.020	1	1.99%	YES	2.03%	
4	1,3-Butadiene	12	8636-F1	0.020	1	2.02%	YES	2.03%	
4	1,3-Butadiene	14	8636-G1	0.020	1	1.96%	YES	2.03%	
4	1,3-Butadiene	16	8636-H1	0.019	1	1.94%	YES	2.03%	
4	1,3-Butadiene	2	8636-A2	0.019	1	1.91%	YES	2.03%	
4	1,3-Butadiene	4	8636-B2	0.019	1	1.92%	YES	2.03%	
4	1,3-Butadiene	6	8636-C2	0.018	1	1.81%	YES	2.03%	
4	1,3-Butadiene	8	8636-D2	0.020	1	2.02%	YES	2.03%	
4	1,3-Butadiene	10	8636-E2	0.020	1	2.02%	YES	2.03%	
4	1,3-Butadiene	12	8636-F2	0.020	1	1.99%	YES	2.03%	
4	1,3-Butadiene	14	8636-G2	0.020	1	2.03%	YES	2.03%	
4	1,3-Butadiene	16	8636-H2	0.019	1	1.91%	YES	2.03%	
5	Benzene	2	8635-A1	0.00014	0.5	0.028%		0.026%	J
5	Benzene	4	8635-B1	0.00012	0.5	0.023%		0.026%	J
5	Benzene	6	8635-C1	0.00011	0.5	0.022%		0.026%	J
5	Benzene	8	8635-D1	0.00013	0.5	0.025%		0.026%	J
5	Benzene	10	8635-E1	0.00013	0.5	0.027%		0.026%	J
5	Benzene	12	8635-F1	0.00012	0.5	0.023%		0.026%	J
5	Benzene	14	8635-G1	0.00012	0.5	0.024%		0.026%	J
5	Benzene	16	8635-H1	0.00013	0.5	0.025%		0.026%	J
5	Benzene	2	8635-A2	0.00010	0.5	0.020%	YES	0.026%	U
5	Benzene	4	8635-B2	0.00010	0.5	0.019%	YES	0.026%	U
5	Benzene	6	8635-C2	0.00010	0.5	0.021%	YES	0.026%	U
5	Benzene	8	8635-D2	0.00011	0.5	0.022%	YES	0.026%	U
5	Benzene	10	8635-E2	0.00010	0.5	0.021%	YES	0.026%	U
5	Benzene	12	8635-F2	0.00010	0.5	0.020%	YES	0.026%	U
5	Benzene	14	8635-G2	0.00010	0.5	0.020%	YES	0.026%	U
5	Benzene	16	8635-H2	0.00010	0.5	0.020%	YES	0.026%	U
5	Benzene	2	8636-A1	0.00016	0.5	0.031%		0.026%	J
5	Benzene	4	8636-B1	0.00015	0.5	0.031%		0.026%	J
5	Benzene	6	8636-C1	0.00015	0.5	0.030%		0.026%	J
5	Benzene	8	8636-D1	0.00016	0.5	0.031%		0.026%	J
5	Benzene	10	8636-E1	0.00015	0.5	0.029%		0.026%	J
5	Benzene	12	8636-F1	0.00017	0.5	0.033%		0.026%	J
5	Benzene	14	8636-G1	0.00022	0.5	0.044%		0.026%	J
5	Benzene	16	8636-H1	0.00020	0.5	0.039%		0.026%	J
5	Benzene	2	8636-A2	0.00012	0.5	0.024%	YES	0.026%	U
5	Benzene	4	8636-B2	0.00012	0.5	0.024%	YES	0.026%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
5	Benzene	6	8636-C2	0.00011	0.5	0.023%	YES	0.026%	U
5	Benzene	8	8636-D2	0.00013	0.5	0.025%	YES	0.026%	U
5	Benzene	10	8636-E2	0.00013	0.5	0.026%	YES	0.026%	U
5	Benzene	12	8636-F2	0.00012	0.5	0.025%	YES	0.026%	U
5	Benzene	14	8636-G2	0.00012	0.5	0.024%	YES	0.026%	U
5	Benzene	16	8636-H2	0.00012	0.5	0.024%	YES	0.026%	U
6	Biphenyl	2	8635-A1	0.00016	0.2	0.082%	YES	0.141%	U
6	Biphenyl	4						0.141%	
6	Biphenyl	6	8635-C1	0.00017	0.2	0.084%	YES	0.141%	U
6	Biphenyl	8	8635-D1	0.00017	0.2	0.084%	YES	0.141%	U
6	Biphenyl	10	8635-E1	0.00017	0.2	0.086%	YES	0.141%	U
6	Biphenyl	12	8635-F1	0.00017	0.2	0.084%	YES	0.141%	U
6	Biphenyl	14	8635-G1	0.00015	0.2	0.077%	YES	0.141%	U
6	Biphenyl	16	8635-H1	0.00016	0.2	0.078%	YES	0.141%	U
6	Biphenyl	2	8635-A2	0.00016	0.2	0.082%	YES	0.141%	U
6	Biphenyl	4	8635-B2	0.00017	0.2	0.084%	YES	0.141%	U
6	Biphenyl	6	8635-C2	0.00017	0.2	0.084%	YES	0.141%	U
6	Biphenyl	8	8635-D2	0.00017	0.2	0.085%	YES	0.141%	U
6	Biphenyl	10	8635-E2	0.00017	0.2	0.083%	YES	0.141%	U
6	Biphenyl	12	8635-F2	0.00028	0.2	0.141%	YES	0.141%	U
6	Biphenyl	14	8635-G2	0.00014	0.2	0.072%	YES	0.141%	U
6	Biphenyl	16	8635-H2	0.00015	0.2	0.077%	YES	0.141%	U
6	Biphenyl	2	8636-A1	0.00016	0.2	0.081%	YES	0.141%	U
6	Biphenyl	4	8636-B1	0.00016	0.2	0.078%	YES	0.141%	U
6	Biphenyl	6	8636-C1	0.00016	0.2	0.080%	YES	0.141%	U
6	Biphenyl	8	8636-D1	0.00017	0.2	0.086%	YES	0.141%	U
6	Biphenyl	10	8636-E1	0.00017	0.2	0.086%	YES	0.141%	U
6	Biphenyl	12	8636-F1	0.00016	0.2	0.081%	YES	0.141%	U
6	Biphenyl	14						0.141%	
6	Biphenyl	16	8636-H1	0.00016	0.2	0.079%	YES	0.141%	U
6	Biphenyl	2	8636-A2	0.00018	0.2	0.088%	YES	0.141%	U
6	Biphenyl	4	8636-B2	0.00017	0.2	0.087%	YES	0.141%	U
6	Biphenyl	6	8636-C2	0.00016	0.2	0.081%	YES	0.141%	U
6	Biphenyl	8	8636-D2	0.00018	0.2	0.088%	YES	0.141%	U
6	Biphenyl	10	8636-E2	0.00016	0.2	0.079%	YES	0.141%	U
6	Biphenyl	12	8636-F2	0.00015	0.2	0.077%	YES	0.141%	U
6	Biphenyl	14	8636-G2	0.00015	0.2	0.077%	YES	0.141%	U
6	Biphenyl	16	8636-H2	0.00015	0.2	0.077%	YES	0.141%	U
7	1-Butanol	2	8635-A1	0.2022	20	1.011%		0.004%	ELY
7	1-Butanol	4	8635-B1	0.1949	20	0.974%		0.004%	ELY
7	1-Butanol	6	8635-C1	0.2000	20	1.000%		0.004%	ELY
7	1-Butanol	8	8635-D1	0.2051	20	1.025%		0.004%	ELY
7	1-Butanol	10	8635-E1	0.2127	20	1.064%		0.004%	ELY
7	1-Butanol	12	8635-F1	0.2010	20	1.005%		0.004%	ELY
7	1-Butanol	14	8635-G1	0.2071	20	1.035%		0.004%	ELY
7	1-Butanol	16	8635-H1	0.2001	20	1.000%		0.004%	ELY
7	1-Butanol	2	8635-A2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	4	8635-B2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	6	8635-C2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	8	8635-D2	0.0009	20	0.004%	YES	0.004%	LUY
7	1-Butanol	10	8635-E2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	12	8635-F2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	14	8635-G2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	16	8635-H2	0.0008	20	0.004%	YES	0.004%	LUY
7	1-Butanol	2	8636-A1	0.1284	20	0.642%		0.004%	E
7	1-Butanol	4	8636-B1	0.1358	20	0.679%		0.004%	E
7	1-Butanol	6	8636-C1	0.1319	20	0.659%		0.004%	E
7	1-Butanol	8	8636-D1	0.1361	20	0.681%		0.004%	E
7	1-Butanol	10	8636-E1	0.1288	20	0.644%		0.004%	E
7	1-Butanol	12	8636-F1	0.1305	20	0.653%		0.004%	E

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
7	1-Butanol	14	8636-G1	0.1254	20	0.627%		0.004%	E
7	1-Butanol	16	8636-H1	0.1300	20	0.650%		0.004%	E
7	1-Butanol	2	8636-A2	0.0004	20	0.002%		0.004%	U
7	1-Butanol	4	8636-B2	0.0014	20	0.007%	YES	0.004%	J
7	1-Butanol	6	8636-C2	0.0003	20	0.002%	YES	0.004%	U
7	1-Butanol	8	8636-D2	0.0004	20	0.002%	YES	0.004%	U
7	1-Butanol	10	8636-E2	0.0004	20	0.002%	YES	0.004%	U
7	1-Butanol	12	8636-F2	0.0004	20	0.002%	YES	0.004%	U
7	1-Butanol	14	8636-G2	0.0004	20	0.002%	YES	0.004%	U
7	1-Butanol	16	8636-H2	0.0004	20	0.002%	YES	0.004%	U
9	2-Hexanone	2	8635-A1	0.00019	5	0.0038%		0.0034%	J
9	2-Hexanone	4	8635-B1	0.00022	5	0.0044%		0.0034%	J
9	2-Hexanone	6	8635-C1	0.00024	5	0.0048%		0.0034%	J
9	2-Hexanone	8	8635-D1	0.00020	5	0.0040%		0.0034%	J
9	2-Hexanone	10	8635-E1	0.00020	5	0.0039%		0.0034%	J
9	2-Hexanone	12	8635-F1	0.00019	5	0.0038%		0.0034%	J
9	2-Hexanone	14	8635-G1	0.00019	5	0.0038%		0.0034%	J
9	2-Hexanone	16	8635-H1	0.00019	5	0.0038%		0.0034%	J
9	2-Hexanone	2	8635-A2	0.00008	5	0.0015%	YES	0.0034%	U
9	2-Hexanone	4	8635-B2	0.00008	5	0.0015%	YES	0.0034%	U
9	2-Hexanone	6	8635-C2	0.00008	5	0.0016%	YES	0.0034%	U
9	2-Hexanone	8	8635-D2	0.00009	5	0.0017%	YES	0.0034%	U
9	2-Hexanone	10	8635-E2	0.00008	5	0.0016%	YES	0.0034%	U
9	2-Hexanone	12	8635-F2	0.00008	5	0.0016%	YES	0.0034%	U
9	2-Hexanone	14	8635-G2	0.00008	5	0.0016%	YES	0.0034%	U
9	2-Hexanone	16	8635-H2	0.00008	5	0.0016%	YES	0.0034%	U
9	2-Hexanone	2	8636-A1	0.00018	5	0.0037%		0.0034%	J
9	2-Hexanone	4	8636-B1	0.00025	5	0.0050%		0.0034%	J
9	2-Hexanone	6	8636-C1	0.00026	5	0.0051%		0.0034%	J
9	2-Hexanone	8	8636-D1	0.00023	5	0.0046%		0.0034%	J
9	2-Hexanone	10	8636-E1	0.00021	5	0.0042%		0.0034%	J
9	2-Hexanone	12	8636-F1	0.00019	5	0.0037%		0.0034%	J
9	2-Hexanone	14	8636-G1	0.00017	5	0.0033%		0.0034%	J
9	2-Hexanone	16	8636-H1	0.00021	5	0.0042%		0.0034%	J
9	2-Hexanone	2	8636-A2	0.00016	5	0.0032%	YES	0.0034%	U
9	2-Hexanone	4	8636-B2	0.00015	5	0.0031%	YES	0.0034%	U
9	2-Hexanone	6	8636-C2	0.00015	5	0.0030%	YES	0.0034%	U
9	2-Hexanone	8	8636-D2	0.00016	5	0.0033%	YES	0.0034%	U
9	2-Hexanone	10	8636-E2	0.00017	5	0.0034%	YES	0.0034%	U
9	2-Hexanone	12	8636-F2	0.00016	5	0.0032%	YES	0.0034%	U
9	2-Hexanone	14	8636-G2	0.00015	5	0.0031%	YES	0.0034%	U
9	2-Hexanone	16	8636-H2	0.00015	5	0.0031%	YES	0.0034%	U
11	4-Methyl-2-hexanone	2	8635-A1	0.00007	0.5	0.014%	YES	0.031%	U
11	4-Methyl-2-hexanone	4	8635-B1	0.00007	0.5	0.014%	YES	0.031%	U
11	4-Methyl-2-hexanone	6	8635-C1	0.00008	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	8	8635-D1	0.00008	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	10	8635-E1	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	12	8635-F1	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	14	8635-G1	0.00007	0.5	0.014%	YES	0.031%	U
11	4-Methyl-2-hexanone	16	8635-H1	0.00007	0.5	0.014%	YES	0.031%	U
11	4-Methyl-2-hexanone	2	8635-A2	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	4	8635-B2	0.00007	0.5	0.014%	YES	0.031%	U
11	4-Methyl-2-hexanone	6	8635-C2	0.00008	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	8	8635-D2	0.00008	0.5	0.017%	YES	0.031%	U
11	4-Methyl-2-hexanone	10	8635-E2	0.00008	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	12	8635-F2	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	14	8635-G2	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	16	8635-H2	0.00007	0.5	0.015%	YES	0.031%	U
11	4-Methyl-2-hexanone	2	8636-A1	0.00015	0.5	0.031%	YES	0.031%	U
11	4-Methyl-2-hexanone	4	8636-B1	0.00014	0.5	0.029%	YES	0.031%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
11	4-Methyl-2-hexanone	6	8636-C1	0.00014	0.5	0.028%	YES	0.031%	U
11	4-Methyl-2-hexanone	8	8636-D1	0.00015	0.5	0.031%	YES	0.031%	U
11	4-Methyl-2-hexanone	10	8636-E1	0.00014	0.5	0.029%	YES	0.031%	U
11	4-Methyl-2-hexanone	12	8636-F1	0.00015	0.5	0.029%	YES	0.031%	U
11	4-Methyl-2-hexanone	14	8636-G1	0.00014	0.5	0.028%	YES	0.031%	U
11	4-Methyl-2-hexanone	16	8636-H1	0.00015	0.5	0.029%	YES	0.031%	U
11	4-Methyl-2-hexanone	2	8636-A2	0.00014	0.5	0.029%	YES	0.031%	U
11	4-Methyl-2-hexanone	4	8636-B2	0.00014	0.5	0.028%	YES	0.031%	U
11	4-Methyl-2-hexanone	6	8636-C2	0.00014	0.5	0.027%	YES	0.031%	U
11	4-Methyl-2-hexanone	8	8636-D2	0.00015	0.5	0.030%	YES	0.031%	U
11	4-Methyl-2-hexanone	10	8636-E2	0.00015	0.5	0.031%	YES	0.031%	U
11	4-Methyl-2-hexanone	12	8636-F2	0.00015	0.5	0.029%	YES	0.031%	U
11	4-Methyl-2-hexanone	14	8636-G2	0.00014	0.5	0.028%	YES	0.031%	U
11	4-Methyl-2-hexanone	16	8636-H2	0.00014	0.5	0.028%	YES	0.031%	U
13	3-Buten-2-one	2	8635-A1	0.00058	0.2	0.29%		0.09%	J
13	3-Buten-2-one	4	8635-B1	0.00059	0.2	0.30%		0.09%	J
13	3-Buten-2-one	6	8635-C1	0.00062	0.2	0.31%		0.09%	J
13	3-Buten-2-one	8	8635-D1	0.00061	0.2	0.31%		0.09%	J
13	3-Buten-2-one	10	8635-E1	0.00051	0.2	0.25%		0.09%	J
13	3-Buten-2-one	12	8635-F1	0.00050	0.2	0.25%		0.09%	J
13	3-Buten-2-one	14	8635-G1	0.00045	0.2	0.22%		0.09%	J
13	3-Buten-2-one	16	8635-H1	0.00042	0.2	0.21%		0.09%	J
13	3-Buten-2-one	2	8635-A2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	4	8635-B2	0.00015	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	6	8635-C2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	8	8635-D2	0.00018	0.2	0.09%	YES	0.09%	U
13	3-Buten-2-one	10	8635-E2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	12	8635-F2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	14	8635-G2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	16	8635-H2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	2	8636-A1	0.00046	0.2	0.23%		0.09%	J
13	3-Buten-2-one	4	8636-B1	0.00060	0.2	0.30%		0.09%	J
13	3-Buten-2-one	6	8636-C1	0.00059	0.2	0.30%		0.09%	J
13	3-Buten-2-one	8	8636-D1	0.00056	0.2	0.28%		0.09%	J
13	3-Buten-2-one	10	8636-E1	0.00052	0.2	0.26%		0.09%	J
13	3-Buten-2-one	12	8636-F1	0.00052	0.2	0.26%		0.09%	J
13	3-Buten-2-one	14	8636-G1	0.00045	0.2	0.23%		0.09%	J
13	3-Buten-2-one	16	8636-H1	0.00046	0.2	0.23%		0.09%	J
13	3-Buten-2-one	2	8636-A2	0.00017	0.2	0.09%	YES	0.09%	U
13	3-Buten-2-one	4	8636-B2	0.00017	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	6	8636-C2	0.00016	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	8	8636-D2	0.00018	0.2	0.09%	YES	0.09%	U
13	3-Buten-2-one	10	8636-E2	0.00018	0.2	0.09%	YES	0.09%	U
13	3-Buten-2-one	12	8636-F2	0.00018	0.2	0.09%	YES	0.09%	U
13	3-Buten-2-one	14	8636-G2	0.00017	0.2	0.08%	YES	0.09%	U
13	3-Buten-2-one	16	8636-H2	0.00017	0.2	0.08%	YES	0.09%	U
14	Formaldehyde	2	8635-A1	0.0067	0.3	2.24%		0.61%	
14	Formaldehyde	4	8635-B1	0.0018	0.3	0.62%		0.61%	
14	Formaldehyde	6	8635-C1	0.0018	0.3	0.60%	YES	0.61%	
14	Formaldehyde	8	8635-D1	0.0021	0.3	0.70%		0.61%	
14	Formaldehyde	10	8635-E1	0.0032	0.3	1.06%		0.61%	
14	Formaldehyde	12	8635-F1	0.0030	0.3	0.99%		0.61%	
14	Formaldehyde	14	8635-G1	0.0022	0.3	0.74%		0.61%	
14	Formaldehyde	16	8635-H1	0.0017	0.3	0.58%	YES	0.61%	
14	Formaldehyde	2	8635-A2	0.0017	0.3	0.56%	YES	0.61%	
14	Formaldehyde	4	8635-B2	0.0017	0.3	0.58%	YES	0.61%	
14	Formaldehyde	6	8635-C2	0.0018	0.3	0.61%	YES	0.61%	
14	Formaldehyde	8	8635-D2	0.0018	0.3	0.61%	YES	0.61%	
14	Formaldehyde	10	8635-E2	0.0018	0.3	0.59%	YES	0.61%	
14	Formaldehyde	12	8635-F2	0.0017	0.3	0.58%	YES	0.61%	

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
14	Formaldehyde	14	8635-G2	0.0017	0.3	0.56%	YES	0.61%	
14	Formaldehyde	16	8635-H2	0.0017	0.3	0.56%	YES	0.61%	
14	Formaldehyde	2	8636-A1	0.0079	0.3	2.64%		0.61%	
14	Formaldehyde	4	8636-B1	0.0026	0.3	0.86%		0.61%	
14	Formaldehyde	6	8636-C1	0.0016	0.3	0.55%	YES	0.61%	
14	Formaldehyde	8	8636-D1	0.0022	0.3	0.74%		0.61%	
14	Formaldehyde	10	8636-E1	0.0033	0.3	1.09%		0.61%	
14	Formaldehyde	12	8636-F1	0.0031	0.3	1.03%		0.61%	
14	Formaldehyde	14	8636-G1	0.0025	0.3	0.84%		0.61%	
14	Formaldehyde	16	8636-H1	0.0026	0.3	0.88%		0.61%	
14	Formaldehyde	2	8636-A2	0.0020	0.3	0.67%		0.61%	
14	Formaldehyde	4	8636-B2	0.0017	0.3	0.58%	YES	0.61%	
14	Formaldehyde	6	8636-C2	0.0016	0.3	0.54%	YES	0.61%	
14	Formaldehyde	8	8636-D2	0.0018	0.3	0.59%	YES	0.61%	
14	Formaldehyde	10	8636-E2	0.0028	0.3	0.95%		0.61%	
14	Formaldehyde	12	8636-F2	0.0018	0.3	0.59%	YES	0.61%	
14	Formaldehyde	14	8636-G2	0.0018	0.3	0.60%	YES	0.61%	
14	Formaldehyde	16	8636-H2	0.0018	0.3	0.60%	YES	0.61%	
15	Acetaldehyde	2	8635-A1	0.017	25	0.067%		0.005%	
15	Acetaldehyde	4	8635-B1	0.017	25	0.068%		0.005%	
15	Acetaldehyde	6	8635-C1	0.016	25	0.065%		0.005%	
15	Acetaldehyde	8	8635-D1	0.016	25	0.064%		0.005%	
15	Acetaldehyde	10	8635-E1	0.016	25	0.064%		0.005%	
15	Acetaldehyde	12	8635-F1	0.015	25	0.061%		0.005%	
15	Acetaldehyde	14	8635-G1	0.016	25	0.062%		0.005%	
15	Acetaldehyde	16	8635-H1	0.016	25	0.063%		0.005%	
15	Acetaldehyde	2	8635-A2	0.006	25	0.026%		0.005%	
15	Acetaldehyde	4	8635-B2	0.010	25	0.040%		0.005%	
15	Acetaldehyde	6	8635-C2	0.010	25	0.040%		0.005%	
15	Acetaldehyde	8	8635-D2	0.010	25	0.041%		0.005%	
15	Acetaldehyde	10	8635-E2	0.010	25	0.040%		0.005%	
15	Acetaldehyde	12	8635-F2	0.010	25	0.040%		0.005%	
15	Acetaldehyde	14	8635-G2	0.010	25	0.042%		0.005%	
15	Acetaldehyde	16	8635-H2	0.010	25	0.039%		0.005%	
15	Acetaldehyde	2	8636-A1	0.017	25	0.067%		0.005%	
15	Acetaldehyde	4	8636-B1	0.016	25	0.064%		0.005%	
15	Acetaldehyde	6	8636-C1	0.017	25	0.066%		0.005%	
15	Acetaldehyde	8	8636-D1	0.016	25	0.062%		0.005%	
15	Acetaldehyde	10	8636-E1	0.016	25	0.064%		0.005%	
15	Acetaldehyde	12	8636-F1	0.015	25	0.060%		0.005%	
15	Acetaldehyde	14	8636-G1	0.012	25	0.049%		0.005%	
15	Acetaldehyde	16	8636-H1	0.015	25	0.058%		0.005%	
15	Acetaldehyde	2	8636-A2	0.008	25	0.033%		0.005%	
15	Acetaldehyde	4	8636-B2	0.008	25	0.034%		0.005%	
15	Acetaldehyde	6	8636-C2	0.010	25	0.041%		0.005%	
15	Acetaldehyde	8	8636-D2	0.010	25	0.040%		0.005%	
15	Acetaldehyde	10	8636-E2	0.012	25	0.047%		0.005%	
15	Acetaldehyde	12	8636-F2	0.011	25	0.045%		0.005%	
15	Acetaldehyde	14	8636-G2	0.011	25	0.044%		0.005%	
15	Acetaldehyde	16	8636-H2	0.011	25	0.042%		0.005%	
16	Butanal	2	8635-A1	0.00125	25	0.0050%		0.0011%	
16	Butanal	4	8635-B1	0.00142	25	0.0057%		0.0011%	
16	Butanal	6	8635-C1	0.00215	25	0.0086%		0.0011%	
16	Butanal	8	8635-D1	0.00128	25	0.0051%		0.0011%	
16	Butanal	10	8635-E1	0.00128	25	0.0051%		0.0011%	
16	Butanal	12	8635-F1	0.00135	25	0.0054%		0.0011%	
16	Butanal	14	8635-G1	0.00111	25	0.0044%		0.0011%	
16	Butanal	16	8635-H1	0.00103	25	0.0041%		0.0011%	J
16	Butanal	2	8635-A2	0.00019	25	0.0007%	YES	0.0011%	U
16	Butanal	4	8635-B2	0.00018	25	0.0007%	YES	0.0011%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
16	Butanal	6	8635-C2	0.00020	25	0.0008%	YES	0.0011%	U
16	Butanal	8	8635-D2	0.00021	25	0.0008%	YES	0.0011%	U
16	Butanal	10	8635-E2	0.00020	25	0.0008%	YES	0.0011%	U
16	Butanal	12	8635-F2	0.00019	25	0.0008%	YES	0.0011%	U
16	Butanal	14	8635-G2	0.00019	25	0.0008%	YES	0.0011%	U
16	Butanal	16	8635-H2	0.00019	25	0.0008%	YES	0.0011%	U
16	Butanal	2	8636-A1	0.00104	25	0.0041%		0.0011%	
16	Butanal	4	8636-B1	0.00131	25	0.0052%		0.0011%	
16	Butanal	6	8636-C1	0.00161	25	0.0064%		0.0011%	
16	Butanal	8	8636-D1	0.00131	25	0.0052%		0.0011%	
16	Butanal	10	8636-E1	0.00124	25	0.0049%		0.0011%	
16	Butanal	12	8636-F1	0.00089	25	0.0036%		0.0011%	
16	Butanal	14	8636-G1	0.00120	25	0.0048%		0.0011%	
16	Butanal	16	8636-H1	0.00116	25	0.0046%		0.0011%	
16	Butanal	2	8636-A2	0.00026	25	0.0011%	YES	0.0011%	U
16	Butanal	4	8636-B2	0.00026	25	0.0010%	YES	0.0011%	U
16	Butanal	6	8636-C2	0.00025	25	0.0010%	YES	0.0011%	U
16	Butanal	8	8636-D2	0.00027	25	0.0011%	YES	0.0011%	U
16	Butanal	10	8636-E2	0.00028	25	0.0011%	YES	0.0011%	U
16	Butanal	12	8636-F2	0.00027	25	0.0011%	YES	0.0011%	U
16	Butanal	14	8636-G2	0.00026	25	0.0010%	YES	0.0011%	U
16	Butanal	16	8636-H2	0.00026	25	0.0010%	YES	0.0011%	U
19	Furan	2	8635-A1	0.000033	0.001	3.31%	YES	5.65%	U
19	Furan	4	8635-B1	0.000033	0.001	3.26%	YES	5.65%	U
19	Furan	6	8635-C1	0.000034	0.001	3.41%	YES	5.65%	U
19	Furan	8	8635-D1	0.000033	0.001	3.35%	YES	5.65%	U
19	Furan	10	8635-E1	0.000035	0.001	3.46%	YES	5.65%	U
19	Furan	12	8635-F1	0.000035	0.001	3.47%	YES	5.65%	U
19	Furan	14	8635-G1	0.000033	0.001	3.34%	YES	5.65%	U
19	Furan	16	8635-H1	0.000033	0.001	3.32%	YES	5.65%	U
19	Furan	2	8635-A2	0.000021	0.001	2.13%	YES	5.65%	U
19	Furan	4	8635-B2	0.000021	0.001	2.08%	YES	5.65%	U
19	Furan	6	8635-C2	0.000022	0.001	2.17%	YES	5.65%	U
19	Furan	8	8635-D2	0.000022	0.001	2.21%	YES	5.65%	U
19	Furan	10	8635-E2	0.000023	0.001	2.27%	YES	5.65%	U
19	Furan	12	8635-F2	0.000023	0.001	2.33%	YES	5.65%	U
19	Furan	14	8635-G2	0.000021	0.001	2.13%	YES	5.65%	U
19	Furan	16	8635-H2	0.000022	0.001	2.15%	YES	5.65%	U
19	Furan	2	8636-A1	0.000054	0.001	5.41%	YES	5.65%	U
19	Furan	4	8636-B1	0.000052	0.001	5.22%	YES	5.65%	U
19	Furan	6	8636-C1	0.000049	0.001	4.88%	YES	5.65%	U
19	Furan	8	8636-D1	0.000054	0.001	5.42%	YES	5.65%	U
19	Furan	10	8636-E1	0.000055	0.001	5.52%	YES	5.65%	U
19	Furan	12	8636-F1	0.000056	0.001	5.65%	YES	5.65%	U
19	Furan	14	8636-G1	0.000053	0.001	5.26%	YES	5.65%	U
19	Furan	16						5.65%	
19	Furan	2	8636-A2	0.000033	0.001	3.30%	YES	5.65%	U
19	Furan	4	8636-B2	0.000037	0.001	3.69%	YES	5.65%	U
19	Furan	6	8636-C2	0.000035	0.001	3.46%	YES	5.65%	U
19	Furan	8	8636-D2	0.000038	0.001	3.79%	YES	5.65%	U
19	Furan	10	8636-E2	0.000039	0.001	3.86%	YES	5.65%	U
19	Furan	12	8636-F2	0.000038	0.001	3.79%	YES	5.65%	U
19	Furan	14	8636-G2	0.000034	0.001	3.36%	YES	5.65%	U
19	Furan	16	8636-H2	0.000035	0.001	3.52%	YES	5.65%	U
20	2,3-Dihydrofuran	2	8635-A1	0.000025	0.001	2.52%		3.03%	J
20	2,3-Dihydrofuran	4	8635-B1	0.000020	0.001	1.97%	YES	3.03%	U
20	2,3-Dihydrofuran	6	8635-C1	0.000021	0.001	2.06%	YES	3.03%	U
20	2,3-Dihydrofuran	8	8635-D1	0.000020	0.001	2.02%	YES	3.03%	U
20	2,3-Dihydrofuran	10	8635-E1	0.000021	0.001	2.09%	YES	3.03%	U
20	2,3-Dihydrofuran	12	8635-F1	0.000021	0.001	2.10%	YES	3.03%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
20	2,3-Dihydrofuran	14	8635-G1	0.000020	0.001	2.02%	YES	3.03%	U
20	2,3-Dihydrofuran	16	8635-H1	0.000020	0.001	2.01%	YES	3.03%	U
20	2,3-Dihydrofuran	2	8635-A2	0.000013	0.001	1.29%	YES	3.03%	U
20	2,3-Dihydrofuran	4	8635-B2	0.000013	0.001	1.26%	YES	3.03%	U
20	2,3-Dihydrofuran	6	8635-C2	0.000013	0.001	1.31%	YES	3.03%	U
20	2,3-Dihydrofuran	8	8635-D2	0.000013	0.001	1.33%	YES	3.03%	U
20	2,3-Dihydrofuran	10	8635-E2	0.000014	0.001	1.37%	YES	3.03%	U
20	2,3-Dihydrofuran	12	8635-F2	0.000014	0.001	1.41%	YES	3.03%	U
20	2,3-Dihydrofuran	14	8635-G2	0.000013	0.001	1.29%	YES	3.03%	U
20	2,3-Dihydrofuran	16	8635-H2	0.000013	0.001	1.30%	YES	3.03%	U
20	2,3-Dihydrofuran	2	8636-A1	0.000029	0.001	2.90%	YES	3.03%	U
20	2,3-Dihydrofuran	4	8636-B1	0.000028	0.001	2.80%	YES	3.03%	U
20	2,3-Dihydrofuran	6	8636-C1	0.000026	0.001	2.62%	YES	3.03%	U
20	2,3-Dihydrofuran	8	8636-D1	0.000029	0.001	2.90%	YES	3.03%	U
20	2,3-Dihydrofuran	10	8636-E1	0.000030	0.001	2.96%	YES	3.03%	U
20	2,3-Dihydrofuran	12	8636-F1	0.000030	0.001	3.03%	YES	3.03%	U
20	2,3-Dihydrofuran	14	8636-G1	0.000028	0.001	2.82%	YES	3.03%	U
20	2,3-Dihydrofuran	16						3.03%	
20	2,3-Dihydrofuran	2	8636-A2	0.000018	0.001	1.77%	YES	3.03%	U
20	2,3-Dihydrofuran	4	8636-B2	0.000020	0.001	1.98%	YES	3.03%	U
20	2,3-Dihydrofuran	6	8636-C2	0.000019	0.001	1.85%	YES	3.03%	U
20	2,3-Dihydrofuran	8	8636-D2	0.000020	0.001	2.03%	YES	3.03%	U
20	2,3-Dihydrofuran	10	8636-E2	0.000021	0.001	2.07%	YES	3.03%	U
20	2,3-Dihydrofuran	12	8636-F2	0.000020	0.001	2.03%	YES	3.03%	U
20	2,3-Dihydrofuran	14	8636-G2	0.000018	0.001	1.80%	YES	3.03%	U
20	2,3-Dihydrofuran	16	8636-H2	0.000019	0.001	1.89%	YES	3.03%	U
21	2,5-Dihydrofuran	2	8635-A1	0.000029	0.001	2.87%	YES	4.26%	U
21	2,5-Dihydrofuran	4	8635-B1	0.000028	0.001	2.82%	YES	4.26%	U
21	2,5-Dihydrofuran	6	8635-C1	0.000030	0.001	2.95%	YES	4.26%	U
21	2,5-Dihydrofuran	8	8635-D1	0.000029	0.001	2.90%	YES	4.26%	U
21	2,5-Dihydrofuran	10	8635-E1	0.000030	0.001	3.00%	YES	4.26%	U
21	2,5-Dihydrofuran	12	8635-F1	0.000030	0.001	3.01%	YES	4.26%	U
21	2,5-Dihydrofuran	14	8635-G1	0.000029	0.001	2.90%	YES	4.26%	U
21	2,5-Dihydrofuran	16	8635-H1	0.000029	0.001	2.88%	YES	4.26%	U
21	2,5-Dihydrofuran	2	8635-A2	0.000018	0.001	1.85%	YES	4.26%	U
21	2,5-Dihydrofuran	4	8635-B2	0.000018	0.001	1.81%	YES	4.26%	U
21	2,5-Dihydrofuran	6	8635-C2	0.000019	0.001	1.88%	YES	4.26%	U
21	2,5-Dihydrofuran	8	8635-D2	0.000019	0.001	1.91%	YES	4.26%	U
21	2,5-Dihydrofuran	10	8635-E2	0.000020	0.001	1.97%	YES	4.26%	U
21	2,5-Dihydrofuran	12	8635-F2	0.000020	0.001	2.02%	YES	4.26%	U
21	2,5-Dihydrofuran	14	8635-G2	0.000018	0.001	1.85%	YES	4.26%	U
21	2,5-Dihydrofuran	16	8635-H2	0.000019	0.001	1.86%	YES	4.26%	U
21	2,5-Dihydrofuran	2	8636-A1	0.000041	0.001	4.08%	YES	4.26%	U
21	2,5-Dihydrofuran	4	8636-B1	0.000039	0.001	3.93%	YES	4.26%	U
21	2,5-Dihydrofuran	6	8636-C1	0.000037	0.001	3.68%	YES	4.26%	U
21	2,5-Dihydrofuran	8	8636-D1	0.000041	0.001	4.09%	YES	4.26%	U
21	2,5-Dihydrofuran	10	8636-E1	0.000042	0.001	4.16%	YES	4.26%	U
21	2,5-Dihydrofuran	12	8636-F1	0.000043	0.001	4.26%	YES	4.26%	U
21	2,5-Dihydrofuran	14	8636-G1	0.000040	0.001	3.96%	YES	4.26%	U
21	2,5-Dihydrofuran	16						4.26%	
21	2,5-Dihydrofuran	2	8636-A2	0.000025	0.001	2.49%	YES	4.26%	U
21	2,5-Dihydrofuran	4	8636-B2	0.000028	0.001	2.78%	YES	4.26%	U
21	2,5-Dihydrofuran	6	8636-C2	0.000026	0.001	2.60%	YES	4.26%	U
21	2,5-Dihydrofuran	8	8636-D2	0.000029	0.001	2.85%	YES	4.26%	U
21	2,5-Dihydrofuran	10	8636-E2	0.000029	0.001	2.91%	YES	4.26%	U
21	2,5-Dihydrofuran	12	8636-F2	0.000029	0.001	2.85%	YES	4.26%	U
21	2,5-Dihydrofuran	14	8636-G2	0.000025	0.001	2.53%	YES	4.26%	U
21	2,5-Dihydrofuran	16	8636-H2	0.000027	0.001	2.65%	YES	4.26%	U
22	2-Methylfuran	2	8635-A1	0.000034	0.001	3.42%	YES	3.58%	U
22	2-Methylfuran	4	8635-B1	0.000034	0.001	3.36%	YES	3.58%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
22	2-Methylfuran	6	8635-C1	0.000035	0.001	3.52%	YES	3.58%	U
22	2-Methylfuran	8	8635-D1	0.000035	0.001	3.45%	YES	3.58%	U
22	2-Methylfuran	10	8635-E1	0.000036	0.001	3.57%	YES	3.58%	U
22	2-Methylfuran	12	8635-F1	0.000036	0.001	3.58%	YES	3.58%	U
22	2-Methylfuran	14	8635-G1	0.000034	0.001	3.45%	YES	3.58%	U
22	2-Methylfuran	16	8635-H1	0.000034	0.001	3.43%	YES	3.58%	U
22	2-Methylfuran	2	8635-A2	0.000022	0.001	2.20%	YES	3.58%	U
22	2-Methylfuran	4	8635-B2	0.000021	0.001	2.15%	YES	3.58%	U
22	2-Methylfuran	6	8635-C2	0.000022	0.001	2.23%	YES	3.58%	U
22	2-Methylfuran	8	8635-D2	0.000023	0.001	2.28%	YES	3.58%	U
22	2-Methylfuran	10	8635-E2	0.000023	0.001	2.34%	YES	3.58%	U
22	2-Methylfuran	12	8635-F2	0.000024	0.001	2.40%	YES	3.58%	U
22	2-Methylfuran	14	8635-G2	0.000022	0.001	2.20%	YES	3.58%	U
22	2-Methylfuran	16	8635-H2	0.000022	0.001	2.22%	YES	3.58%	U
22	2-Methylfuran	2	8636-A1	0.000012	0.001	1.16%	YES	3.58%	U
22	2-Methylfuran	4	8636-B1	0.000011	0.001	1.12%	YES	3.58%	U
22	2-Methylfuran	6	8636-C1	0.000010	0.001	1.08%	YES	3.58%	U
22	2-Methylfuran	8	8636-D1	0.000012	0.001	1.16%	YES	3.58%	U
22	2-Methylfuran	10	8636-E1	0.000012	0.001	1.18%	YES	3.58%	U
22	2-Methylfuran	12	8636-F1	0.000012	0.001	1.21%	YES	3.58%	U
22	2-Methylfuran	14	8636-G1	0.000011	0.001	1.13%	YES	3.58%	U
22	2-Methylfuran	16						3.58%	
22	2-Methylfuran	2	8636-A2	0.000007	0.001	0.71%	YES	3.58%	U
22	2-Methylfuran	4	8636-B2	0.000008	0.001	0.79%	YES	3.58%	U
22	2-Methylfuran	6	8636-C2	0.000007	0.001	0.74%	YES	3.58%	U
22	2-Methylfuran	8	8636-D2	0.000008	0.001	0.81%	YES	3.58%	U
22	2-Methylfuran	10	8636-E2	0.000008	0.001	0.83%	YES	3.58%	U
22	2-Methylfuran	12	8636-F2	0.000008	0.001	0.81%	YES	3.58%	U
22	2-Methylfuran	14	8636-G2	0.000007	0.001	0.72%	YES	3.58%	U
22	2-Methylfuran	16	8636-H2	0.000008	0.001	0.75%	YES	3.58%	U
23	2,5-Dimethylfuran	2	8635-A1	0.000048	0.001	4.76%	YES	4.98%	U
23	2,5-Dimethylfuran	4	8635-B1	0.000047	0.001	4.68%	YES	4.98%	U
23	2,5-Dimethylfuran	6	8635-C1	0.000049	0.001	4.90%	YES	4.98%	U
23	2,5-Dimethylfuran	8	8635-D1	0.000048	0.001	4.80%	YES	4.98%	U
23	2,5-Dimethylfuran	10	8635-E1	0.000050	0.001	4.97%	YES	4.98%	U
23	2,5-Dimethylfuran	12	8635-F1	0.000050	0.001	4.98%	YES	4.98%	U
23	2,5-Dimethylfuran	14	8635-G1	0.000048	0.001	4.80%	YES	4.98%	U
23	2,5-Dimethylfuran	16	8635-H1	0.000048	0.001	4.77%	YES	4.98%	U
23	2,5-Dimethylfuran	2	8635-A2	0.000031	0.001	3.06%	YES	4.98%	U
23	2,5-Dimethylfuran	4	8635-B2	0.000030	0.001	2.99%	YES	4.98%	U
23	2,5-Dimethylfuran	6	8635-C2	0.000031	0.001	3.11%	YES	4.98%	U
23	2,5-Dimethylfuran	8	8635-D2	0.000032	0.001	3.17%	YES	4.98%	U
23	2,5-Dimethylfuran	10	8635-E2	0.000033	0.001	3.27%	YES	4.98%	U
23	2,5-Dimethylfuran	12	8635-F2	0.000033	0.001	3.34%	YES	4.98%	U
23	2,5-Dimethylfuran	14	8635-G2	0.000031	0.001	3.06%	YES	4.98%	U
23	2,5-Dimethylfuran	16	8635-H2	0.000031	0.001	3.09%	YES	4.98%	U
23	2,5-Dimethylfuran	2	8636-A1	0.000017	0.001	1.72%	YES	4.98%	U
23	2,5-Dimethylfuran	4	8636-B1	0.000017	0.001	1.66%	YES	4.98%	U
23	2,5-Dimethylfuran	6	8636-C1	0.000015	0.001	1.55%	YES	4.98%	U
23	2,5-Dimethylfuran	8	8636-D1	0.000017	0.001	1.72%	YES	4.98%	U
23	2,5-Dimethylfuran	10	8636-E1	0.000018	0.001	1.75%	YES	4.98%	U
23	2,5-Dimethylfuran	12	8636-F1	0.000018	0.001	1.79%	YES	4.98%	U
23	2,5-Dimethylfuran	14	8636-G1	0.000017	0.001	1.67%	YES	4.98%	U
23	2,5-Dimethylfuran	16						4.98%	
23	2,5-Dimethylfuran	2	8636-A2	0.000010	0.001	1.05%	YES	4.98%	U
23	2,5-Dimethylfuran	4	8636-B2	0.000012	0.001	1.17%	YES	4.98%	U
23	2,5-Dimethylfuran	6	8636-C2	0.000011	0.001	1.10%	YES	4.98%	U
23	2,5-Dimethylfuran	8	8636-D2	0.000012	0.001	1.20%	YES	4.98%	U
23	2,5-Dimethylfuran	10	8636-E2	0.000012	0.001	1.22%	YES	4.98%	U
23	2,5-Dimethylfuran	12	8636-F2	0.000012	0.001	1.20%	YES	4.98%	U
23	2,5-Dimethylfuran	14	8636-G2	0.000011	0.001	1.07%	YES	4.98%	U
23	2,5-Dimethylfuran	16	8636-H2	0.000011	0.001	1.12%	YES	4.98%	U



COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
27	2-Pentylfuran	2	8635-A1	0.000040	0.001	3.97%	YES	4.16%	U
27	2-Pentylfuran	4	8635-B1	0.000039	0.001	3.90%	YES	4.16%	U
27	2-Pentylfuran	6	8635-C1	0.000041	0.001	4.09%	YES	4.16%	U
27	2-Pentylfuran	8	8635-D1	0.000040	0.001	4.01%	YES	4.16%	U
27	2-Pentylfuran	10	8635-E1	0.000041	0.001	4.14%	YES	4.16%	U
27	2-Pentylfuran	12	8635-F1	0.000042	0.001	4.16%	YES	4.16%	U
27	2-Pentylfuran	14	8635-G1	0.000040	0.001	4.00%	YES	4.16%	U
27	2-Pentylfuran	16	8635-H1	0.000040	0.001	3.98%	YES	4.16%	U
27	2-Pentylfuran	2	8635-A2	0.000026	0.001	2.56%	YES	4.16%	U
27	2-Pentylfuran	4	8635-B2	0.000025	0.001	2.50%	YES	4.16%	U
27	2-Pentylfuran	6	8635-C2	0.000026	0.001	2.60%	YES	4.16%	U
27	2-Pentylfuran	8	8635-D2	0.000026	0.001	2.64%	YES	4.16%	U
27	2-Pentylfuran	10	8635-E2	0.000027	0.001	2.73%	YES	4.16%	U
27	2-Pentylfuran	12	8635-F2	0.000028	0.001	2.79%	YES	4.16%	U
27	2-Pentylfuran	14	8635-G2	0.000026	0.001	2.55%	YES	4.16%	U
27	2-Pentylfuran	16	8635-H2	0.000026	0.001	2.58%	YES	4.16%	U
27	2-Pentylfuran	2	8636-A1	0.000013	0.001	1.33%	YES	4.16%	U
27	2-Pentylfuran	4	8636-B1	0.000013	0.001	1.29%	YES	4.16%	U
27	2-Pentylfuran	6	8636-C1	0.000012	0.001	1.20%	YES	4.16%	U
27	2-Pentylfuran	8	8636-D1	0.000013	0.001	1.34%	YES	4.16%	U
27	2-Pentylfuran	10	8636-E1	0.000014	0.001	1.36%	YES	4.16%	U
27	2-Pentylfuran	12	8636-F1	0.000014	0.001	1.39%	YES	4.16%	U
27	2-Pentylfuran	14	8636-G1	0.000013	0.001	1.29%	YES	4.16%	U
27	2-Pentylfuran	16						4.16%	
27	2-Pentylfuran	2	8636-A2	0.000008	0.001	0.81%	YES	4.16%	U
27	2-Pentylfuran	4	8636-B2	0.000009	0.001	0.91%	YES	4.16%	U
27	2-Pentylfuran	6	8636-C2	0.000009	0.001	0.83%	YES	4.16%	U
27	2-Pentylfuran	8	8636-D2	0.000009	0.001	0.93%	YES	4.16%	U
27	2-Pentylfuran	10	8636-E2	0.000009	0.001	0.95%	YES	4.16%	U
27	2-Pentylfuran	12	8636-F2	0.000009	0.001	0.93%	YES	4.16%	U
27	2-Pentylfuran	14	8636-G2	0.000008	0.001	0.83%	YES	4.16%	U
27	2-Pentylfuran	16	8636-H2	0.000009	0.001	0.87%	YES	4.16%	U
28	2-Heptylfuran	2	8635-A1	0.000032	0.001	3.15%	YES	3.30%	U
28	2-Heptylfuran	4	8635-B1	0.000031	0.001	3.10%	YES	3.30%	U
28	2-Heptylfuran	6	8635-C1	0.000032	0.001	3.25%	YES	3.30%	U
28	2-Heptylfuran	8	8635-D1	0.000032	0.001	3.19%	YES	3.30%	U
28	2-Heptylfuran	10	8635-E1	0.000033	0.001	3.29%	YES	3.30%	U
28	2-Heptylfuran	12	8635-F1	0.000033	0.001	3.30%	YES	3.30%	U
28	2-Heptylfuran	14	8635-G1	0.000032	0.001	3.18%	YES	3.30%	U
28	2-Heptylfuran	16	8635-H1	0.000032	0.001	3.16%	YES	3.30%	U
28	2-Heptylfuran	2	8635-A2	0.000020	0.001	2.03%	YES	3.30%	U
28	2-Heptylfuran	4	8635-B2	0.000020	0.001	1.98%	YES	3.30%	U
28	2-Heptylfuran	6	8635-C2	0.000021	0.001	2.06%	YES	3.30%	U
28	2-Heptylfuran	8	8635-D2	0.000021	0.001	2.10%	YES	3.30%	U
28	2-Heptylfuran	10	8635-E2	0.000022	0.001	2.16%	YES	3.30%	U
28	2-Heptylfuran	12	8635-F2	0.000022	0.001	2.22%	YES	3.30%	U
28	2-Heptylfuran	14	8635-G2	0.000020	0.001	2.03%	YES	3.30%	U
28	2-Heptylfuran	16	8635-H2	0.000020	0.001	2.05%	YES	3.30%	U
28	2-Heptylfuran	2	8636-A1	0.000015	0.001	1.45%	YES	3.30%	U
28	2-Heptylfuran	4	8636-B1	0.000014	0.001	1.40%	YES	3.30%	U
28	2-Heptylfuran	6	8636-C1	0.000013	0.001	1.31%	YES	3.30%	U
28	2-Heptylfuran	8	8636-D1	0.000015	0.001	1.45%	YES	3.30%	U
28	2-Heptylfuran	10	8636-E1	0.000015	0.001	1.48%	YES	3.30%	U
28	2-Heptylfuran	12	8636-F1	0.000015	0.001	1.52%	YES	3.30%	U
28	2-Heptylfuran	14	8636-G1	0.000014	0.001	1.41%	YES	3.30%	U
28	2-Heptylfuran	16						3.30%	
28	2-Heptylfuran	2	8636-A2	0.000009	0.001	0.88%	YES	3.30%	U
28	2-Heptylfuran	4	8636-B2	0.000010	0.001	0.99%	YES	3.30%	U
28	2-Heptylfuran	6	8636-C2	0.000009	0.001	0.93%	YES	3.30%	U
28	2-Heptylfuran	8	8636-D2	0.000010	0.001	1.02%	YES	3.30%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
28	2-Heptylfuran	10	8636-E2	0.000010	0.001	1.03%	YES	3.30%	U
28	2-Heptylfuran	12	8636-F2	0.000010	0.001	1.02%	YES	3.30%	U
28	2-Heptylfuran	14	8636-G2	0.000009	0.001	0.90%	YES	3.30%	U
28	2-Heptylfuran	16	8636-H2	0.000009	0.001	0.94%	YES	3.30%	U
29	2-Propylfuran	2	8635-A1	0.000034	0.001	3.43%	YES	3.60%	U
29	2-Propylfuran	4	8635-B1	0.000034	0.001	3.37%	YES	3.60%	U
29	2-Propylfuran	6	8635-C1	0.000035	0.001	3.53%	YES	3.60%	U
29	2-Propylfuran	8	8635-D1	0.000035	0.001	3.47%	YES	3.60%	U
29	2-Propylfuran	10	8635-E1	0.000036	0.001	3.58%	YES	3.60%	U
29	2-Propylfuran	12	8635-F1	0.000036	0.001	3.60%	YES	3.60%	U
29	2-Propylfuran	14	8635-G1	0.000035	0.001	3.46%	YES	3.60%	U
29	2-Propylfuran	16	8635-H1	0.000034	0.001	3.44%	YES	3.60%	U
29	2-Propylfuran	2	8635-A2	0.000022	0.001	2.21%	YES	3.60%	U
29	2-Propylfuran	4	8635-B2	0.000022	0.001	2.16%	YES	3.60%	U
29	2-Propylfuran	6	8635-C2	0.000022	0.001	2.25%	YES	3.60%	U
29	2-Propylfuran	8	8635-D2	0.000023	0.001	2.29%	YES	3.60%	U
29	2-Propylfuran	10	8635-E2	0.000024	0.001	2.36%	YES	3.60%	U
29	2-Propylfuran	12	8635-F2	0.000024	0.001	2.41%	YES	3.60%	U
29	2-Propylfuran	14	8635-G2	0.000022	0.001	2.21%	YES	3.60%	U
29	2-Propylfuran	16	8635-H2	0.000022	0.001	2.23%	YES	3.60%	U
29	2-Propylfuran	2	8636-A1	0.000012	0.001	1.21%	YES	3.60%	U
29	2-Propylfuran	4	8636-B1	0.000012	0.001	1.17%	YES	3.60%	U
29	2-Propylfuran	6	8636-C1	0.000011	0.001	1.09%	YES	3.60%	U
29	2-Propylfuran	8	8636-D1	0.000012	0.001	1.21%	YES	3.60%	U
29	2-Propylfuran	10	8636-E1	0.000012	0.001	1.23%	YES	3.60%	U
29	2-Propylfuran	12	8636-F1	0.000013	0.001	1.26%	YES	3.60%	U
29	2-Propylfuran	14	8636-G1	0.000012	0.001	1.18%	YES	3.60%	U
29	2-Propylfuran	16						3.60%	
29	2-Propylfuran	2	8636-A2	0.000007	0.001	0.74%	YES	3.60%	U
29	2-Propylfuran	4	8636-B2	0.000008	0.001	0.83%	YES	3.60%	U
29	2-Propylfuran	6	8636-C2	0.000008	0.001	0.77%	YES	3.60%	U
29	2-Propylfuran	8	8636-D2	0.000008	0.001	0.85%	YES	3.60%	U
29	2-Propylfuran	10	8636-E2	0.000009	0.001	0.86%	YES	3.60%	U
29	2-Propylfuran	12	8636-F2	0.000008	0.001	0.85%	YES	3.60%	U
29	2-Propylfuran	14	8636-G2	0.000008	0.001	0.75%	YES	3.60%	U
29	2-Propylfuran	16	8636-H2	0.000008	0.001	0.79%	YES	3.60%	U
33	Diethylphthalate	2	8635-A1	0.00020	0.550	0.036%	YES	0.062%	U
33	Diethylphthalate	4						0.062%	
33	Diethylphthalate	6	8635-C1	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	8	8635-D1	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	10	8635-E1	0.00021	0.550	0.038%	YES	0.062%	U
33	Diethylphthalate	12	8635-F1	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	14	8635-G1	0.00019	0.550	0.034%	YES	0.062%	U
33	Diethylphthalate	16	8635-H1	0.00019	0.550	0.035%	YES	0.062%	U
33	Diethylphthalate	2	8635-A2	0.00020	0.550	0.036%	YES	0.062%	U
33	Diethylphthalate	4	8635-B2	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	6	8635-C2	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	8	8635-D2	0.00021	0.550	0.038%	YES	0.062%	U
33	Diethylphthalate	10	8635-E2	0.00020	0.550	0.037%	YES	0.062%	U
33	Diethylphthalate	12	8635-F2	0.00034	0.550	0.062%	YES	0.062%	U
33	Diethylphthalate	14	8635-G2	0.00018	0.550	0.032%	YES	0.062%	U
33	Diethylphthalate	16	8635-H2	0.00019	0.550	0.034%	YES	0.062%	U
33	Diethylphthalate	2	8636-A1	0.00020	0.550	0.036%	YES	0.062%	U
33	Diethylphthalate	4	8636-B1	0.00019	0.550	0.035%	YES	0.062%	U
33	Diethylphthalate	6	8636-C1	0.00019	0.550	0.035%	YES	0.062%	U
33	Diethylphthalate	8	8636-D1	0.00021	0.550	0.038%	YES	0.062%	U
33	Diethylphthalate	10	8636-E1	0.00021	0.550	0.038%	YES	0.062%	U
33	Diethylphthalate	12	8636-F1	0.00020	0.550	0.036%	YES	0.062%	U
33	Diethylphthalate	14						0.062%	
33	Diethylphthalate	16	8636-H1	0.00019	0.550	0.035%	YES	0.062%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
33	Diethylphthalate	2	8636-A2	0.00021	0.550	0.039%	YES	0.062%	U
33	Diethylphthalate	4	8636-B2	0.00021	0.550	0.038%	YES	0.062%	U
33	Diethylphthalate	6	8636-C2	0.00020	0.550	0.036%	YES	0.062%	U
33	Diethylphthalate	8	8636-D2	0.00021	0.550	0.039%	YES	0.062%	U
33	Diethylphthalate	10	8636-E2	0.00019	0.550	0.035%	YES	0.062%	U
33	Diethylphthalate	12	8636-F2	0.00019	0.550	0.034%	YES	0.062%	U
33	Diethylphthalate	14	8636-G2	0.00019	0.550	0.034%	YES	0.062%	U
33	Diethylphthalate	16	8636-H2	0.00019	0.550	0.034%	YES	0.062%	U
34	Acetonitrile	2	8635-A1	0.0064	20	0.0321%		0.0015%	
34	Acetonitrile	4	8635-B1	0.0044	20	0.0220%		0.0015%	
34	Acetonitrile	6	8635-C1	0.0048	20	0.0238%		0.0015%	
34	Acetonitrile	8	8635-D1	0.0069	20	0.0346%		0.0015%	
34	Acetonitrile	10	8635-E1	0.0018	20	0.0088%		0.0015%	J
34	Acetonitrile	12	8635-F1	0.0014	20	0.0072%		0.0015%	J
34	Acetonitrile	14	8635-G1	0.0025	20	0.0127%		0.0015%	
34	Acetonitrile	16	8635-H1	0.0024	20	0.0120%		0.0015%	
34	Acetonitrile	2	8635-A2	0.0013	20	0.0067%		0.0015%	J
34	Acetonitrile	4	8635-B2	0.0017	20	0.0084%		0.0015%	J
34	Acetonitrile	6	8635-C2	0.0033	20	0.0165%		0.0015%	
34	Acetonitrile	8	8635-D2	0.0011	20	0.0057%		0.0015%	J
34	Acetonitrile	10	8635-E2	0.0012	20	0.0061%		0.0015%	J
34	Acetonitrile	12	8635-F2	0.0009	20	0.0046%		0.0015%	J
34	Acetonitrile	14	8635-G2	0.0008	20	0.0042%		0.0015%	J
34	Acetonitrile	16	8635-H2	0.0009	20	0.0045%		0.0015%	J
34	Acetonitrile	2	8636-A1	0.0397	20	0.1987%		0.0015%	
34	Acetonitrile	4	8636-B1	0.0291	20	0.1456%		0.0015%	
34	Acetonitrile	6	8636-C1	0.0140	20	0.0700%		0.0015%	
34	Acetonitrile	8	8636-D1	0.0197	20	0.0983%		0.0015%	
34	Acetonitrile	10	8636-E1	0.0051	20	0.0256%		0.0015%	
34	Acetonitrile	12	8636-F1	0.0057	20	0.0283%		0.0015%	
34	Acetonitrile	14	8636-G1	0.0045	20	0.0227%		0.0015%	
34	Acetonitrile	16	8636-H1	0.1001	20	0.5007%		0.0015%	E
34	Acetonitrile	2	8636-A2	0.0294	20	0.1471%		0.0015%	
34	Acetonitrile	4	8636-B2	0.0423	20	0.2117%		0.0015%	
34	Acetonitrile	6	8636-C2	0.0333	20	0.1666%		0.0015%	
34	Acetonitrile	8	8636-D2	0.0069	20	0.0343%		0.0015%	
34	Acetonitrile	10	8636-E2	0.0510	20	0.2550%		0.0015%	
34	Acetonitrile	12	8636-F2	0.0614	20	0.3068%		0.0015%	
34	Acetonitrile	14	8636-G2	0.0045	20	0.0226%		0.0015%	
34	Acetonitrile	16	8636-H2	0.2558	20	1.2792%		0.0015%	E
35	Propanenitrile	2	8635-A1	0.00033	6	0.0054%		0.0037%	J
35	Propanenitrile	4	8635-B1	0.00031	6	0.0051%		0.0037%	J
35	Propanenitrile	6	8635-C1	0.00033	6	0.0055%		0.0037%	J
35	Propanenitrile	8	8635-D1	0.00034	6	0.0056%		0.0037%	J
35	Propanenitrile	10	8635-E1	0.00029	6	0.0048%		0.0037%	J
35	Propanenitrile	12	8635-F1	0.00028	6	0.0047%		0.0037%	J
35	Propanenitrile	14	8635-G1	0.00032	6	0.0054%		0.0037%	J
35	Propanenitrile	16	8635-H1	0.00030	6	0.0050%		0.0037%	J
35	Propanenitrile	2	8635-A2	0.00016	6	0.0027%	YES	0.0037%	U
35	Propanenitrile	4	8635-B2	0.00016	6	0.0027%	YES	0.0037%	U
35	Propanenitrile	6	8635-C2	0.00017	6	0.0029%	YES	0.0037%	U
35	Propanenitrile	8	8635-D2	0.00018	6	0.0031%	YES	0.0037%	U
35	Propanenitrile	10	8635-E2	0.00017	6	0.0028%	YES	0.0037%	U
35	Propanenitrile	12	8635-F2	0.00017	6	0.0028%	YES	0.0037%	U
35	Propanenitrile	14	8635-G2	0.00017	6	0.0028%	YES	0.0037%	U
35	Propanenitrile	16	8635-H2	0.00017	6	0.0028%	YES	0.0037%	U
35	Propanenitrile	2	8636-A1	0.00028	6	0.0047%		0.0037%	J
35	Propanenitrile	4	8636-B1	0.00035	6	0.0059%		0.0037%	J
35	Propanenitrile	6	8636-C1	0.00033	6	0.0055%		0.0037%	J
35	Propanenitrile	8	8636-D1	0.00032	6	0.0053%		0.0037%	J

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
35	Propanenitrile	10	8636-E1	0.00032	6	0.0054%		0.0037%	J
35	Propanenitrile	12	8636-F1	0.00034	6	0.0057%		0.0037%	J
35	Propanenitrile	14	8636-G1	0.00027	6	0.0045%		0.0037%	J
35	Propanenitrile	16	8636-H1	0.00030	6	0.0051%		0.0037%	J
35	Propanenitrile	2	8636-A2	0.00021	6	0.0035%	YES	0.0037%	U
35	Propanenitrile	4	8636-B2	0.00020	6	0.0034%	YES	0.0037%	U
35	Propanenitrile	6	8636-C2	0.00019	6	0.0032%	YES	0.0037%	U
35	Propanenitrile	8	8636-D2	0.00021	6	0.0036%	YES	0.0037%	U
35	Propanenitrile	10	8636-E2	0.00022	6	0.0037%	YES	0.0037%	U
35	Propanenitrile	12	8636-F2	0.00021	6	0.0035%	YES	0.0037%	U
35	Propanenitrile	14	8636-G2	0.00020	6	0.0034%	YES	0.0037%	U
35	Propanenitrile	16	8636-H2	0.00020	6	0.0034%	YES	0.0037%	U
36	Butanenitrile	2	8635-A1	0.00016	8	0.0021%		0.0026%	J
36	Butanenitrile	4	8635-B1	0.00015	8	0.0019%		0.0026%	J
36	Butanenitrile	6	8635-C1	0.00019	8	0.0023%		0.0026%	J
36	Butanenitrile	8	8635-D1	0.00014	8	0.0018%		0.0026%	J
36	Butanenitrile	10	8635-E1	0.00014	8	0.0018%		0.0026%	J
36	Butanenitrile	12	8635-F1	0.00014	8	0.0018%		0.0026%	J
36	Butanenitrile	14	8635-G1	0.00013	8	0.0017%		0.0026%	J
36	Butanenitrile	16	8635-H1	0.00015	8	0.0019%		0.0026%	J
36	Butanenitrile	2	8635-A2	0.00011	8	0.0014%	YES	0.0026%	U
36	Butanenitrile	4	8635-B2	0.00011	8	0.0014%	YES	0.0026%	U
36	Butanenitrile	6	8635-C2	0.00012	8	0.0015%	YES	0.0026%	U
36	Butanenitrile	8	8635-D2	0.00013	8	0.0016%	YES	0.0026%	U
36	Butanenitrile	10	8635-E2	0.00012	8	0.0015%	YES	0.0026%	U
36	Butanenitrile	12	8635-F2	0.00011	8	0.0014%	YES	0.0026%	U
36	Butanenitrile	14	8635-G2	0.00011	8	0.0014%	YES	0.0026%	U
36	Butanenitrile	16	8635-H2	0.00011	8	0.0014%	YES	0.0026%	U
36	Butanenitrile	2	8636-A1	0.00021	8	0.0026%	YES	0.0026%	U
36	Butanenitrile	4	8636-B1	0.00019	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	6	8636-C1	0.00019	8	0.0023%	YES	0.0026%	U
36	Butanenitrile	8	8636-D1	0.00020	8	0.0026%	YES	0.0026%	U
36	Butanenitrile	10	8636-E1	0.00019	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	12	8636-F1	0.00021	8	0.0026%		0.0026%	J
36	Butanenitrile	14	8636-G1	0.00019	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	16	8636-H1	0.00020	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	2	8636-A2	0.00019	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	4	8636-B2	0.00019	8	0.0024%	YES	0.0026%	U
36	Butanenitrile	6	8636-C2	0.00018	8	0.0023%	YES	0.0026%	U
36	Butanenitrile	8	8636-D2	0.00020	8	0.0025%	YES	0.0026%	U
36	Butanenitrile	10	8636-E2	0.00021	8	0.0026%	YES	0.0026%	U
36	Butanenitrile	12	8636-F2	0.00020	8	0.0025%	YES	0.0026%	U
36	Butanenitrile	14	8636-G2	0.00019	8	0.0023%	YES	0.0026%	U
36	Butanenitrile	16	8636-H2	0.00019	8	0.0023%	YES	0.0026%	U
37	Pentanenitrile	2	8635-A1	0.00012	6	0.0019%	YES	0.0035%	U
37	Pentanenitrile	4	8635-B1	0.00012	6	0.0019%	YES	0.0035%	U
37	Pentanenitrile	6	8635-C1	0.00013	6	0.0022%	YES	0.0035%	U
37	Pentanenitrile	8	8635-D1	0.00013	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	10	8635-E1	0.00013	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	12	8635-F1	0.00012	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	14	8635-G1	0.00012	6	0.0020%	YES	0.0035%	U
37	Pentanenitrile	16	8635-H1	0.00012	6	0.0020%	YES	0.0035%	U
37	Pentanenitrile	2	8635-A2	0.00012	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	4	8635-B2	0.00012	6	0.0020%	YES	0.0035%	U
37	Pentanenitrile	6	8635-C2	0.00013	6	0.0022%	YES	0.0035%	U
37	Pentanenitrile	8	8635-D2	0.00014	6	0.0023%	YES	0.0035%	U
37	Pentanenitrile	10	8635-E2	0.00013	6	0.0022%	YES	0.0035%	U
37	Pentanenitrile	12	8635-F2	0.00013	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	14	8635-G2	0.00013	6	0.0021%	YES	0.0035%	U
37	Pentanenitrile	16	8635-H2	0.00013	6	0.0021%	YES	0.0035%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
37	Pentanenitrile	2	8636-A1	0.00021	6	0.0035%	YES	0.0035%	U
37	Pentanenitrile	4	8636-B1	0.00020	6	0.0033%	YES	0.0035%	U
37	Pentanenitrile	6	8636-C1	0.00019	6	0.0032%	YES	0.0035%	U
37	Pentanenitrile	8	8636-D1	0.00021	6	0.0035%	YES	0.0035%	U
37	Pentanenitrile	10	8636-E1	0.00020	6	0.0033%	YES	0.0035%	U
37	Pentanenitrile	12	8636-F1	0.00020	6	0.0034%	YES	0.0035%	U
37	Pentanenitrile	14	8636-G1	0.00019	6	0.0032%	YES	0.0035%	U
37	Pentanenitrile	16	8636-H1	0.00020	6	0.0033%	YES	0.0035%	U
37	Pentanenitrile	2	8636-A2	0.00020	6	0.0033%	YES	0.0035%	U
37	Pentanenitrile	4	8636-B2	0.00019	6	0.0032%	YES	0.0035%	U
37	Pentanenitrile	6	8636-C2	0.00019	6	0.0031%	YES	0.0035%	U
37	Pentanenitrile	8	8636-D2	0.00020	6	0.0034%	YES	0.0035%	U
37	Pentanenitrile	10	8636-E2	0.00021	6	0.0035%	YES	0.0035%	U
37	Pentanenitrile	12	8636-F2	0.00020	6	0.0034%	YES	0.0035%	U
37	Pentanenitrile	14	8636-G2	0.00019	6	0.0032%	YES	0.0035%	U
37	Pentanenitrile	16	8636-H2	0.00019	6	0.0032%	YES	0.0035%	U
38	Hexanenitrile	2	8635-A1	0.00009	6	0.0015%		0.0030%	J
38	Hexanenitrile	4	8635-B1	0.00009	6	0.0015%	YES	0.0030%	U
38	Hexanenitrile	6	8635-C1	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	8	8635-D1	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	10	8635-E1	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	12	8635-F1	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	14	8635-G1	0.00009	6	0.0016%	YES	0.0030%	U
38	Hexanenitrile	16	8635-H1	0.00010	6	0.0016%	YES	0.0030%	U
38	Hexanenitrile	2	8635-A2	0.00010	6	0.0016%	YES	0.0030%	U
38	Hexanenitrile	4	8635-B2	0.00010	6	0.0016%	YES	0.0030%	U
38	Hexanenitrile	6	8635-C2	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	8	8635-D2	0.00011	6	0.0019%	YES	0.0030%	U
38	Hexanenitrile	10	8635-E2	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	12	8635-F2	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	14	8635-G2	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	16	8635-H2	0.00010	6	0.0017%	YES	0.0030%	U
38	Hexanenitrile	2	8636-A1	0.00018	6	0.0030%	YES	0.0030%	U
38	Hexanenitrile	4	8636-B1	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	6	8636-C1	0.00016	6	0.0027%	YES	0.0030%	U
38	Hexanenitrile	8	8636-D1	0.00018	6	0.0030%	YES	0.0030%	U
38	Hexanenitrile	10	8636-E1	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	12	8636-F1	0.00017	6	0.0029%	YES	0.0030%	U
38	Hexanenitrile	14	8636-G1	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	16	8636-H1	0.00017	6	0.0029%	YES	0.0030%	U
38	Hexanenitrile	2	8636-A2	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	4	8636-B2	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	6	8636-C2	0.00016	6	0.0027%	YES	0.0030%	U
38	Hexanenitrile	8	8636-D2	0.00018	6	0.0029%	YES	0.0030%	U
38	Hexanenitrile	10	8636-E2	0.00018	6	0.0030%	YES	0.0030%	U
38	Hexanenitrile	12	8636-F2	0.00017	6	0.0029%	YES	0.0030%	U
38	Hexanenitrile	14	8636-G2	0.00017	6	0.0028%	YES	0.0030%	U
38	Hexanenitrile	16	8636-H2	0.00017	6	0.0028%	YES	0.0030%	U
42	Ethylamine	2	8635-A1	0.0045	5	0.09%	YES	0.10%	
42	Ethylamine	4	8635-B1	0.0044	5	0.09%	YES	0.10%	
42	Ethylamine	6	8635-C1	0.0045	5	0.09%	YES	0.10%	
42	Ethylamine	8	8635-D1	0.0045	5	0.09%	YES	0.10%	
42	Ethylamine	10	8635-E1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	12	8635-F1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	14	8635-G1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	16	8635-H1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	2	8635-A2	0.0043	5	0.09%	YES	0.10%	
42	Ethylamine	4	8635-B2	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	6	8635-C2	0.0045	5	0.09%	YES	0.10%	
42	Ethylamine	8	8635-D2	0.0046	5	0.09%	YES	0.10%	

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
42	Ethylamine	10	8635-E2	0.0047	5	0.09%	YES	0.10%	
42	Ethylamine	12	8635-F2	0.0047	5	0.09%	YES	0.10%	
42	Ethylamine	14	8635-G2	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	16	8635-H2	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	2	8636-A1	0.0044	5	0.09%	YES	0.10%	
42	Ethylamine	4	8636-B1	0.0043	5	0.09%	YES	0.10%	
42	Ethylamine	6	8636-C1	0.0043	5	0.09%	YES	0.10%	
42	Ethylamine	8	8636-D1	0.0048	5	0.10%	YES	0.10%	
42	Ethylamine	10	8636-E1	0.0049	5	0.10%	YES	0.10%	
42	Ethylamine	12	8636-F1	0.0049	5	0.10%	YES	0.10%	
42	Ethylamine	14	8636-G1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	16	8636-H1	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	2	8636-A2	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	4	8636-B2	0.0044	5	0.09%	YES	0.10%	
42	Ethylamine	6	8636-C2	0.0042	5	0.08%	YES	0.10%	
42	Ethylamine	8	8636-D2	0.0046	5	0.09%	YES	0.10%	
42	Ethylamine	10	8636-E2	0.0047	5	0.09%	YES	0.10%	
42	Ethylamine	12	8636-F2	0.0048	5	0.10%	YES	0.10%	
42	Ethylamine	14	8636-G2	0.0049	5	0.10%	YES	0.10%	
42	Ethylamine	16	8636-H2	0.0046	5	0.09%	YES	0.10%	
43	N-Nitrosodimethylamine	2	8635-A1	0.004522	0.0003	1507%		10.7%	D
43	N-Nitrosodimethylamine	4	8635-B1	0.004604	0.0003	1551%		10.7%	D
43	N-Nitrosodimethylamine	6	8635-C1	0.004689	0.0003	1563%		10.7%	D
43	N-Nitrosodimethylamine	8	8635-D1	0.004913	0.0003	1638%		10.7%	D
43	N-Nitrosodimethylamine	10	8635-E1	0.004285	0.0003	1428%		10.7%	D
43	N-Nitrosodimethylamine	12	8635-F1	0.004457	0.0003	1486%		10.7%	D
43	N-Nitrosodimethylamine	14	8635-G1	0.004176	0.0003	1392%		10.7%	D
43	N-Nitrosodimethylamine	16	8635-H1	0.004013	0.0003	1338%		10.7%	D
43	N-Nitrosodimethylamine	2	8635-A2	0.000025	0.0003	8.33%	YES	10.7%	
43	N-Nitrosodimethylamine	4	8635-B2	0.000024	0.0003	8.08%	YES	10.7%	
43	N-Nitrosodimethylamine	6	8635-C2	0.000025	0.0003	8.33%	YES	10.7%	
43	N-Nitrosodimethylamine	8	8635-D2	0.000025	0.0003	8.44%	YES	10.7%	
43	N-Nitrosodimethylamine	10	8635-E2	0.000025	0.0003	8.26%	YES	10.7%	
43	N-Nitrosodimethylamine	12	8635-F2	0.000024	0.0003	8.16%	YES	10.7%	
43	N-Nitrosodimethylamine	14	8635-G2	0.000024	0.0003	8.12%	YES	10.7%	
43	N-Nitrosodimethylamine	16	8635-H2	0.000024	0.0003	8.10%	YES	10.7%	
43	N-Nitrosodimethylamine	2	8636-A1	0.004309	0.0003	1436%		10.7%	D
43	N-Nitrosodimethylamine	4	8636-B1	0.001729	0.0003	576%		10.7%	D
43	N-Nitrosodimethylamine	6	8636-C1	0.004633	0.0003	1544%		10.7%	D
43	N-Nitrosodimethylamine	8	8636-D1	0.004320	0.0003	1440%		10.7%	D
43	N-Nitrosodimethylamine	10	8636-E1	0.004690	0.0003	1563%		10.7%	D
43	N-Nitrosodimethylamine	12	8636-F1	0.003869	0.0003	1290%		10.7%	D
43	N-Nitrosodimethylamine	14	8636-G1	0.004039	0.0003	1346%		10.7%	D
43	N-Nitrosodimethylamine	16	8636-H1	0.003852	0.0003	1284%		10.7%	D
43	N-Nitrosodimethylamine	2	8636-A2	0.000031	0.0003	10.4%	YES	10.7%	
43	N-Nitrosodimethylamine	4	8636-B2	0.000032	0.0003	10.7%	YES	10.7%	
43	N-Nitrosodimethylamine	6	8636-C2	0.000031	0.0003	10.2%	YES	10.7%	
43	N-Nitrosodimethylamine	8	8636-D2	0.000032	0.0003	10.6%	YES	10.7%	
43	N-Nitrosodimethylamine	10	8636-E2	0.000032	0.0003	10.7%	YES	10.7%	
43	N-Nitrosodimethylamine	12	8636-F2	0.000031	0.0003	10.5%	YES	10.7%	
43	N-Nitrosodimethylamine	14	8636-G2	0.000032	0.0003	10.5%	YES	10.7%	
43	N-Nitrosodimethylamine	16	8636-H2	0.000032	0.0003	10.6%	YES	10.7%	
44	N-Nitrosodiethylamine	2	8635-A1	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	4	8635-B1	0.000023	0.0001	22.7%	YES	23.8%	
44	N-Nitrosodiethylamine	6	8635-C1	0.000023	0.0001	23.1%	YES	23.8%	
44	N-Nitrosodiethylamine	8	8635-D1	0.000023	0.0001	22.7%	YES	23.8%	
44	N-Nitrosodiethylamine	10	8635-E1	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	12	8635-F1	0.000023	0.0001	23.0%	YES	23.8%	
44	N-Nitrosodiethylamine	14	8635-G1	0.000023	0.0001	23.0%	YES	23.8%	
44	N-Nitrosodiethylamine	16	8635-H1	0.000023	0.0001	22.9%	YES	23.8%	

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
44	N-Nitrosodiethylamine	2	8635-A2	0.000023	0.0001	23.5%	YES	23.8%	
44	N-Nitrosodiethylamine	4	8635-B2	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	6	8635-C2	0.000023	0.0001	23.5%	YES	23.8%	
44	N-Nitrosodiethylamine	8	8635-D2	0.000024	0.0001	23.8%	YES	23.8%	
44	N-Nitrosodiethylamine	10	8635-E2	0.000023	0.0001	23.3%	YES	23.8%	
44	N-Nitrosodiethylamine	12	8635-F2	0.000023	0.0001	23.0%	YES	23.8%	
44	N-Nitrosodiethylamine	14	8635-G2	0.000023	0.0001	22.9%	YES	23.8%	
44	N-Nitrosodiethylamine	16	8635-H2	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	2	8636-A1	0.000023	0.0001	22.6%	YES	23.8%	
44	N-Nitrosodiethylamine	4	8636-B1	0.000023	0.0001	22.9%	YES	23.8%	
44	N-Nitrosodiethylamine	6	8636-C1	0.000022	0.0001	21.8%	YES	23.8%	
44	N-Nitrosodiethylamine	8	8636-D1	0.000023	0.0001	23.1%	YES	23.8%	
44	N-Nitrosodiethylamine	10	8636-E1	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	12	8636-F1	0.000023	0.0001	22.9%	YES	23.8%	
44	N-Nitrosodiethylamine	14	8636-G1	0.000023	0.0001	23.4%	YES	23.8%	
44	N-Nitrosodiethylamine	16	8636-H1	0.000023	0.0001	23.1%	YES	23.8%	
44	N-Nitrosodiethylamine	2	8636-A2	0.000023	0.0001	22.7%	YES	23.8%	
44	N-Nitrosodiethylamine	4	8636-B2	0.000023	0.0001	23.2%	YES	23.8%	
44	N-Nitrosodiethylamine	6	8636-C2	0.000022	0.0001	22.1%	YES	23.8%	
44	N-Nitrosodiethylamine	8	8636-D2	0.000023	0.0001	23.1%	YES	23.8%	
44	N-Nitrosodiethylamine	10	8636-E2	0.000023	0.0001	23.2%	YES	23.8%	
44	N-Nitrosodiethylamine	12	8636-F2	0.000023	0.0001	22.8%	YES	23.8%	
44	N-Nitrosodiethylamine	14	8636-G2	0.000023	0.0001	22.9%	YES	23.8%	
44	N-Nitrosodiethylamine	16	8636-H2	0.000023	0.0001	23.0%	YES	23.8%	
45	N-Nitrosomethylethylamine	2	8635-A1	0.000030	0.0003	9.99%		9.18%	
45	N-Nitrosomethylethylamine	4	8635-B1	0.000036	0.0003	12.0%		9.18%	
45	N-Nitrosomethylethylamine	6	8635-C1	0.000039	0.0003	13.0%		9.18%	
45	N-Nitrosomethylethylamine	8	8635-D1	0.000037	0.0003	12.4%		9.18%	
45	N-Nitrosomethylethylamine	10	8635-E1	0.000037	0.0003	12.4%		9.18%	
45	N-Nitrosomethylethylamine	12	8635-F1	0.000035	0.0003	11.7%		9.18%	
45	N-Nitrosomethylethylamine	14	8635-G1	0.000039	0.0003	12.9%		9.18%	
45	N-Nitrosomethylethylamine	16	8635-H1	0.000030	0.0003	10.1%		9.18%	
45	N-Nitrosomethylethylamine	2	8635-A2	0.000027	0.0003	9.07%	YES	9.18%	
45	N-Nitrosomethylethylamine	4	8635-B2	0.000026	0.0003	8.79%	YES	9.18%	
45	N-Nitrosomethylethylamine	6	8635-C2	0.000027	0.0003	9.07%	YES	9.18%	
45	N-Nitrosomethylethylamine	8	8635-D2	0.000028	0.0003	9.18%	YES	9.18%	
45	N-Nitrosomethylethylamine	10	8635-E2	0.000027	0.0003	8.99%	YES	9.18%	
45	N-Nitrosomethylethylamine	12	8635-F2	0.000027	0.0003	8.88%	YES	9.18%	
45	N-Nitrosomethylethylamine	14	8635-G2	0.000027	0.0003	8.81%	YES	9.18%	
45	N-Nitrosomethylethylamine	16	8635-H2	0.000026	0.0003	8.81%	YES	9.18%	
45	N-Nitrosomethylethylamine	2	8636-A1	0.000033	0.0003	11.1%		9.18%	
45	N-Nitrosomethylethylamine	4	8636-B1	0.000025	0.0003	8.44%	YES	9.18%	
45	N-Nitrosomethylethylamine	6	8636-C1	0.000040	0.0003	13.4%		9.18%	
45	N-Nitrosomethylethylamine	8	8636-D1	0.000038	0.0003	12.6%		9.18%	
45	N-Nitrosomethylethylamine	10	8636-E1	0.000042	0.0003	14.0%		9.18%	
45	N-Nitrosomethylethylamine	12	8636-F1	0.000036	0.0003	12.1%		9.18%	
45	N-Nitrosomethylethylamine	14	8636-G1	0.000037	0.0003	12.3%		9.18%	
45	N-Nitrosomethylethylamine	16	8636-H1	0.000033	0.0003	11.0%		9.18%	
45	N-Nitrosomethylethylamine	2	8636-A2	0.000025	0.0003	8.35%	YES	9.18%	
45	N-Nitrosomethylethylamine	4	8636-B2	0.000026	0.0003	8.56%	YES	9.18%	
45	N-Nitrosomethylethylamine	6	8636-C2	0.000024	0.0003	8.16%	YES	9.18%	
45	N-Nitrosomethylethylamine	8	8636-D2	0.000026	0.0003	8.52%	YES	9.18%	
45	N-Nitrosomethylethylamine	10	8636-E2	0.000026	0.0003	8.56%	YES	9.18%	
45	N-Nitrosomethylethylamine	12	8636-F2	0.000025	0.0003	8.42%	YES	9.18%	
45	N-Nitrosomethylethylamine	14	8636-G2	0.000025	0.0003	8.43%	YES	9.18%	
45	N-Nitrosomethylethylamine	16	8636-H2	0.000025	0.0003	8.47%	YES	9.18%	
46	N-Nitrosomorpholine	2	8635-A1	0.000037	0.0006	6.22%		3.48%	
46	N-Nitrosomorpholine	4	8635-B1	0.000037	0.0006	6.21%		3.48%	
46	N-Nitrosomorpholine	6	8635-C1	0.000033	0.0006	5.54%		3.48%	
46	N-Nitrosomorpholine	8	8635-D1	0.000030	0.0006	5.00%		3.48%	

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
46	N-Nitrosomorpholine	10	8635-E1	0.000029	0.0006	4.87%		3.48%	
46	N-Nitrosomorpholine	12	8635-F1	0.000020	0.0006	3.37%	YES	3.48%	
46	N-Nitrosomorpholine	14	8635-G1	0.000020	0.0006	3.38%	YES	3.48%	
46	N-Nitrosomorpholine	16	8635-H1	0.000020	0.0006	3.36%	YES	3.48%	
46	N-Nitrosomorpholine	2	8635-A2	0.000021	0.0006	3.44%	YES	3.48%	
46	N-Nitrosomorpholine	4	8635-B2	0.000020	0.0006	3.34%	YES	3.48%	
46	N-Nitrosomorpholine	6	8635-C2	0.000021	0.0006	3.44%	YES	3.48%	
46	N-Nitrosomorpholine	8	8635-D2	0.000021	0.0006	3.48%	YES	3.48%	
46	N-Nitrosomorpholine	10	8635-E2	0.000020	0.0006	3.41%	YES	3.48%	
46	N-Nitrosomorpholine	12	8635-F2	0.000020	0.0006	3.37%	YES	3.48%	
46	N-Nitrosomorpholine	14	8635-G2	0.000020	0.0006	3.35%	YES	3.48%	
46	N-Nitrosomorpholine	16	8635-H2	0.000020	0.0006	3.34%	YES	3.48%	
46	N-Nitrosomorpholine	2	8636-A1	0.000033	0.0006	5.58%		3.48%	
46	N-Nitrosomorpholine	4	8636-B1	0.000019	0.0006	3.20%	YES	3.48%	
46	N-Nitrosomorpholine	6	8636-C1	0.000028	0.0006	4.64%		3.48%	
46	N-Nitrosomorpholine	8	8636-D1	0.000029	0.0006	4.78%		3.48%	
46	N-Nitrosomorpholine	10	8636-E1	0.000029	0.0006	4.87%		3.48%	
46	N-Nitrosomorpholine	12	8636-F1	0.000024	0.0006	3.97%		3.48%	
46	N-Nitrosomorpholine	14	8636-G1	0.000022	0.0006	3.74%		3.48%	
46	N-Nitrosomorpholine	16	8636-H1	0.000019	0.0006	3.24%	YES	3.48%	
46	N-Nitrosomorpholine	2	8636-A2	0.000019	0.0006	3.17%	YES	3.48%	
46	N-Nitrosomorpholine	4	8636-B2	0.000019	0.0006	3.25%	YES	3.48%	
46	N-Nitrosomorpholine	6	8636-C2	0.000019	0.0006	3.10%	YES	3.48%	
46	N-Nitrosomorpholine	8	8636-D2	0.000019	0.0006	3.23%	YES	3.48%	
46	N-Nitrosomorpholine	10	8636-E2	0.000019	0.0006	3.25%	YES	3.48%	
46	N-Nitrosomorpholine	12	8636-F2	0.000019	0.0006	3.20%	YES	3.48%	
46	N-Nitrosomorpholine	14	8636-G2	0.000019	0.0006	3.20%	YES	3.48%	
46	N-Nitrosomorpholine	16	8636-H2	0.000019	0.0006	3.22%	YES	3.48%	
47	Tributyl phosphate	2	8635-A1	0.00013	0.2	0.066%	YES	0.114%	U
47	Tributyl phosphate	4						0.114%	
47	Tributyl phosphate	6	8635-C1	0.00014	0.2	0.068%	YES	0.114%	U
47	Tributyl phosphate	8	8635-D1	0.00014	0.2	0.068%	YES	0.114%	U
47	Tributyl phosphate	10	8635-E1	0.00014	0.2	0.069%	YES	0.114%	U
47	Tributyl phosphate	12	8635-F1	0.00014	0.2	0.068%	YES	0.114%	U
47	Tributyl phosphate	14	8635-G1	0.00012	0.2	0.062%	YES	0.114%	U
47	Tributyl phosphate	16	8635-H1	0.00013	0.2	0.063%	YES	0.114%	U
47	Tributyl phosphate	2	8635-A2	0.00013	0.2	0.066%	YES	0.114%	U
47	Tributyl phosphate	4	8635-B2	0.00014	0.2	0.068%	YES	0.114%	U
47	Tributyl phosphate	6	8635-C2	0.00014	0.2	0.068%	YES	0.114%	U
47	Tributyl phosphate	8	8635-D2	0.00014	0.2	0.069%	YES	0.114%	U
47	Tributyl phosphate	10	8635-E2	0.00013	0.2	0.067%	YES	0.114%	U
47	Tributyl phosphate	12	8635-F2	0.00023	0.2	0.114%	YES	0.114%	U
47	Tributyl phosphate	14	8635-G2	0.00012	0.2	0.059%	YES	0.114%	U
47	Tributyl phosphate	16	8635-H2	0.00013	0.2	0.063%	YES	0.114%	U
47	Tributyl phosphate	2	8636-A1	0.00013	0.2	0.066%	YES	0.114%	U
47	Tributyl phosphate	4	8636-B1	0.00013	0.2	0.064%	YES	0.114%	U
47	Tributyl phosphate	6	8636-C1	0.00013	0.2	0.065%	YES	0.114%	U
47	Tributyl phosphate	8	8636-D1	0.00014	0.2	0.070%	YES	0.114%	U
47	Tributyl phosphate	10	8636-E1	0.00014	0.2	0.070%	YES	0.114%	U
47	Tributyl phosphate	12	8636-F1	0.00013	0.2	0.065%	YES	0.114%	U
47	Tributyl phosphate	14						0.114%	
47	Tributyl phosphate	16	8636-H1	0.00013	0.2	0.064%	YES	0.114%	U
47	Tributyl phosphate	2	8636-A2	0.00014	0.2	0.071%	YES	0.114%	U
47	Tributyl phosphate	4	8636-B2	0.00014	0.2	0.071%	YES	0.114%	U
47	Tributyl phosphate	6	8636-C2	0.00013	0.2	0.066%	YES	0.114%	U
47	Tributyl phosphate	8	8636-D2	0.00014	0.2	0.071%	YES	0.114%	U
47	Tributyl phosphate	10	8636-E2	0.00013	0.2	0.064%	YES	0.114%	U
47	Tributyl phosphate	12	8636-F2	0.00012	0.2	0.062%	YES	0.114%	U
47	Tributyl phosphate	14	8636-G2	0.00012	0.2	0.062%	YES	0.114%	U
47	Tributyl phosphate	16	8636-H2	0.00013	0.2	0.063%	YES	0.114%	U



COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
48	Dibutyl butylphosphonate	2	8635-A1	0.00009	0.007	1.30%	YES	2.23%	U
48	Dibutyl butylphosphonate	4						2.23%	
48	Dibutyl butylphosphonate	6	8635-C1	0.00009	0.007	1.33%	YES	2.23%	U
48	Dibutyl butylphosphonate	8	8635-D1	0.00009	0.007	1.33%	YES	2.23%	U
48	Dibutyl butylphosphonate	10	8635-E1	0.00009	0.007	1.36%	YES	2.23%	U
48	Dibutyl butylphosphonate	12	8635-F1	0.00009	0.007	1.34%	YES	2.23%	U
48	Dibutyl butylphosphonate	14	8635-G1	0.00008	0.007	1.21%	YES	2.23%	U
48	Dibutyl butylphosphonate	16	8635-H1	0.00009	0.007	1.24%	YES	2.23%	U
48	Dibutyl butylphosphonate	2	8635-A2	0.00009	0.007	1.30%	YES	2.23%	U
48	Dibutyl butylphosphonate	4	8635-B2	0.00009	0.007	1.32%	YES	2.23%	U
48	Dibutyl butylphosphonate	6	8635-C2	0.00009	0.007	1.33%	YES	2.23%	U
48	Dibutyl butylphosphonate	8	8635-D2	0.00009	0.007	1.35%	YES	2.23%	U
48	Dibutyl butylphosphonate	10	8635-E2	0.00009	0.007	1.31%	YES	2.23%	U
48	Dibutyl butylphosphonate	12	8635-F2	0.00016	0.007	2.23%	YES	2.23%	U
48	Dibutyl butylphosphonate	14	8635-G2	0.00008	0.007	1.15%	YES	2.23%	U
48	Dibutyl butylphosphonate	16	8635-H2	0.00009	0.007	1.22%	YES	2.23%	U
48	Dibutyl butylphosphonate	2	8636-A1	0.00009	0.007	1.29%	YES	2.23%	U
48	Dibutyl butylphosphonate	4	8636-B1	0.00009	0.007	1.24%	YES	2.23%	U
48	Dibutyl butylphosphonate	6	8636-C1	0.00009	0.007	1.27%	YES	2.23%	U
48	Dibutyl butylphosphonate	8	8636-D1	0.00010	0.007	1.36%	YES	2.23%	U
48	Dibutyl butylphosphonate	10	8636-E1	0.00010	0.007	1.36%	YES	2.23%	U
48	Dibutyl butylphosphonate	12	8636-F1	0.00009	0.007	1.28%	YES	2.23%	U
48	Dibutyl butylphosphonate	14						2.23%	
48	Dibutyl butylphosphonate	16	8636-H1	0.00009	0.007	1.25%	YES	2.23%	U
48	Dibutyl butylphosphonate	2	8636-A2	0.00010	0.007	1.40%	YES	2.23%	U
48	Dibutyl butylphosphonate	4	8636-B2	0.00010	0.007	1.38%	YES	2.23%	U
48	Dibutyl butylphosphonate	6	8636-C2	0.00009	0.007	1.29%	YES	2.23%	U
48	Dibutyl butylphosphonate	8	8636-D2	0.00010	0.007	1.39%	YES	2.23%	U
48	Dibutyl butylphosphonate	10	8636-E2	0.00009	0.007	1.26%	YES	2.23%	U
48	Dibutyl butylphosphonate	12	8636-F2	0.00008	0.007	1.21%	YES	2.23%	U
48	Dibutyl butylphosphonate	14	8636-G2	0.00009	0.007	1.22%	YES	2.23%	U
48	Dibutyl butylphosphonate	16	8636-H2	0.00009	0.007	1.22%	YES	2.23%	U
51	Pyridine	2	8635-A1	0.00029	1	0.029%	YES	0.035%	U
51	Pyridine	4	8635-B1	0.00029	1	0.029%	YES	0.035%	U
51	Pyridine	6	8635-C1	0.00032	1	0.032%	YES	0.035%	U
51	Pyridine	8	8635-D1	0.00032	1	0.032%	YES	0.035%	U
51	Pyridine	10	8635-E1	0.00032	1	0.032%	YES	0.035%	U
51	Pyridine	12	8635-F1	0.00031	1	0.031%	YES	0.035%	U
51	Pyridine	14	8635-G1	0.00029	1	0.029%	YES	0.035%	U
51	Pyridine	16	8635-H1	0.00030	1	0.030%	YES	0.035%	U
51	Pyridine	2	8635-A2	0.00031	1	0.031%	YES	0.035%	U
51	Pyridine	4	8635-B2	0.00030	1	0.030%	YES	0.035%	U
51	Pyridine	6	8635-C2	0.00033	1	0.033%	YES	0.035%	U
51	Pyridine	8	8635-D2	0.00035	1	0.035%	YES	0.035%	U
51	Pyridine	10	8635-E2	0.00032	1	0.032%	YES	0.035%	U
51	Pyridine	12	8635-F2	0.00031	1	0.031%	YES	0.035%	U
51	Pyridine	14	8635-G2	0.00032	1	0.032%	YES	0.035%	U
51	Pyridine	16	8635-H2	0.00031	1	0.031%	YES	0.035%	U
51	Pyridine	2	8636-A1	0.00024	1	0.024%	YES	0.035%	U
51	Pyridine	4	8636-B1	0.00022	1	0.022%	YES	0.035%	U
51	Pyridine	6	8636-C1	0.00022	1	0.022%	YES	0.035%	U
51	Pyridine	8	8636-D1	0.00024	1	0.024%	YES	0.035%	U
51	Pyridine	10	8636-E1	0.00023	1	0.023%	YES	0.035%	U
51	Pyridine	12	8636-F1	0.00023	1	0.023%	YES	0.035%	U
51	Pyridine	14	8636-G1	0.00022	1	0.022%	YES	0.035%	U
51	Pyridine	16	8636-H1	0.00023	1	0.023%	YES	0.035%	U
51	Pyridine	2	8636-A2	0.00023	1	0.023%	YES	0.035%	U
51	Pyridine	4	8636-B2	0.00022	1	0.022%	YES	0.035%	U
51	Pyridine	6	8636-C2	0.00021	1	0.021%	YES	0.035%	U
51	Pyridine	8	8636-D2	0.00023	1	0.023%	YES	0.035%	U
51	Pyridine	10	8636-E2	0.00024	1	0.024%	YES	0.035%	U
51	Pyridine	12	8636-F2	0.00023	1	0.023%	YES	0.035%	U

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Conc. (% of OEL)	Measurement < DI/RL?	Approx DI/RL	Analytical Flags
51	Pyridine	14	8636-G2	0.00022	1	0.022%	YES	0.035%	U
51	Pyridine	16	8636-H2	0.00022	1	0.022%	YES	0.035%	U
52	2,4-Dimethylpyridine	2	8635-A1	0.00018	0.5	0.037%	YES	0.052%	U
52	2,4-Dimethylpyridine	4	8635-B1	0.00019	0.5	0.037%	YES	0.052%	U
52	2,4-Dimethylpyridine	6	8635-C1	0.00021	0.5	0.042%	YES	0.052%	U
52	2,4-Dimethylpyridine	8	8635-D1	0.00020	0.5	0.041%	YES	0.052%	U
52	2,4-Dimethylpyridine	10	8635-E1	0.00020	0.5	0.040%	YES	0.052%	U
52	2,4-Dimethylpyridine	12	8635-F1	0.00020	0.5	0.040%	YES	0.052%	U
52	2,4-Dimethylpyridine	14	8635-G1	0.00019	0.5	0.038%	YES	0.052%	U
52	2,4-Dimethylpyridine	16	8635-H1	0.00019	0.5	0.038%	YES	0.052%	U
52	2,4-Dimethylpyridine	2	8635-A2	0.00020	0.5	0.039%	YES	0.052%	U
52	2,4-Dimethylpyridine	4	8635-B2	0.00019	0.5	0.039%	YES	0.052%	U
52	2,4-Dimethylpyridine	6	8635-C2	0.00021	0.5	0.042%	YES	0.052%	U
52	2,4-Dimethylpyridine	8	8635-D2	0.00022	0.5	0.045%	YES	0.052%	U
52	2,4-Dimethylpyridine	10	8635-E2	0.00021	0.5	0.041%	YES	0.052%	U
52	2,4-Dimethylpyridine	12	8635-F2	0.00020	0.5	0.040%	YES	0.052%	U
52	2,4-Dimethylpyridine	14	8635-G2	0.00020	0.5	0.040%	YES	0.052%	U
52	2,4-Dimethylpyridine	16	8635-H2	0.00020	0.5	0.040%	YES	0.052%	U
52	2,4-Dimethylpyridine	2	8636-A1	0.00026	0.5	0.052%	YES	0.052%	U
52	2,4-Dimethylpyridine	4	8636-B1	0.00024	0.5	0.048%	YES	0.052%	U
52	2,4-Dimethylpyridine	6	8636-C1	0.00023	0.5	0.047%	YES	0.052%	U
52	2,4-Dimethylpyridine	8	8636-D1	0.00026	0.5	0.051%	YES	0.052%	U
52	2,4-Dimethylpyridine	10	8636-E1	0.00024	0.5	0.049%	YES	0.052%	U
52	2,4-Dimethylpyridine	12	8636-F1	0.00025	0.5	0.049%	YES	0.052%	U
52	2,4-Dimethylpyridine	14	8636-G1	0.00024	0.5	0.047%	YES	0.052%	U
52	2,4-Dimethylpyridine	16	8636-H1	0.00025	0.5	0.049%	YES	0.052%	U
52	2,4-Dimethylpyridine	2	8636-A2	0.00024	0.5	0.049%	YES	0.052%	U
52	2,4-Dimethylpyridine	4	8636-B2	0.00024	0.5	0.047%	YES	0.052%	U
52	2,4-Dimethylpyridine	6	8636-C2	0.00023	0.5	0.046%	YES	0.052%	U
52	2,4-Dimethylpyridine	8	8636-D2	0.00025	0.5	0.050%	YES	0.052%	U
52	2,4-Dimethylpyridine	10	8636-E2	0.00026	0.5	0.052%	YES	0.052%	U
52	2,4-Dimethylpyridine	12	8636-F2	0.00025	0.5	0.049%	YES	0.052%	U
52	2,4-Dimethylpyridine	14	8636-G2	0.00024	0.5	0.047%	YES	0.052%	U
52	2,4-Dimethylpyridine	16	8636-H2	0.00024	0.5	0.047%	YES	0.052%	U

## **Appendix E**

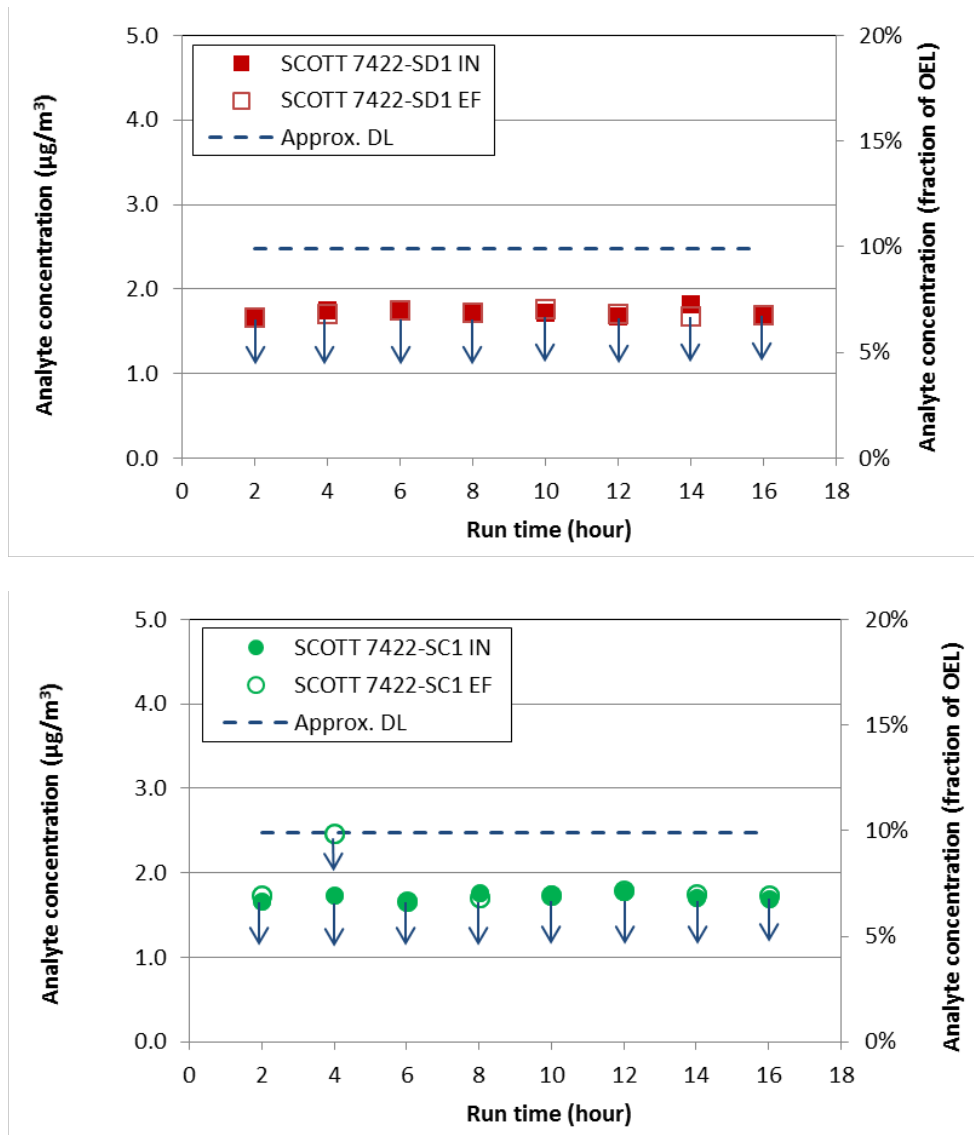
**Plots of Other COPCs with Significant (2–10% of the OEL)  
Detected Values**



## Appendix E

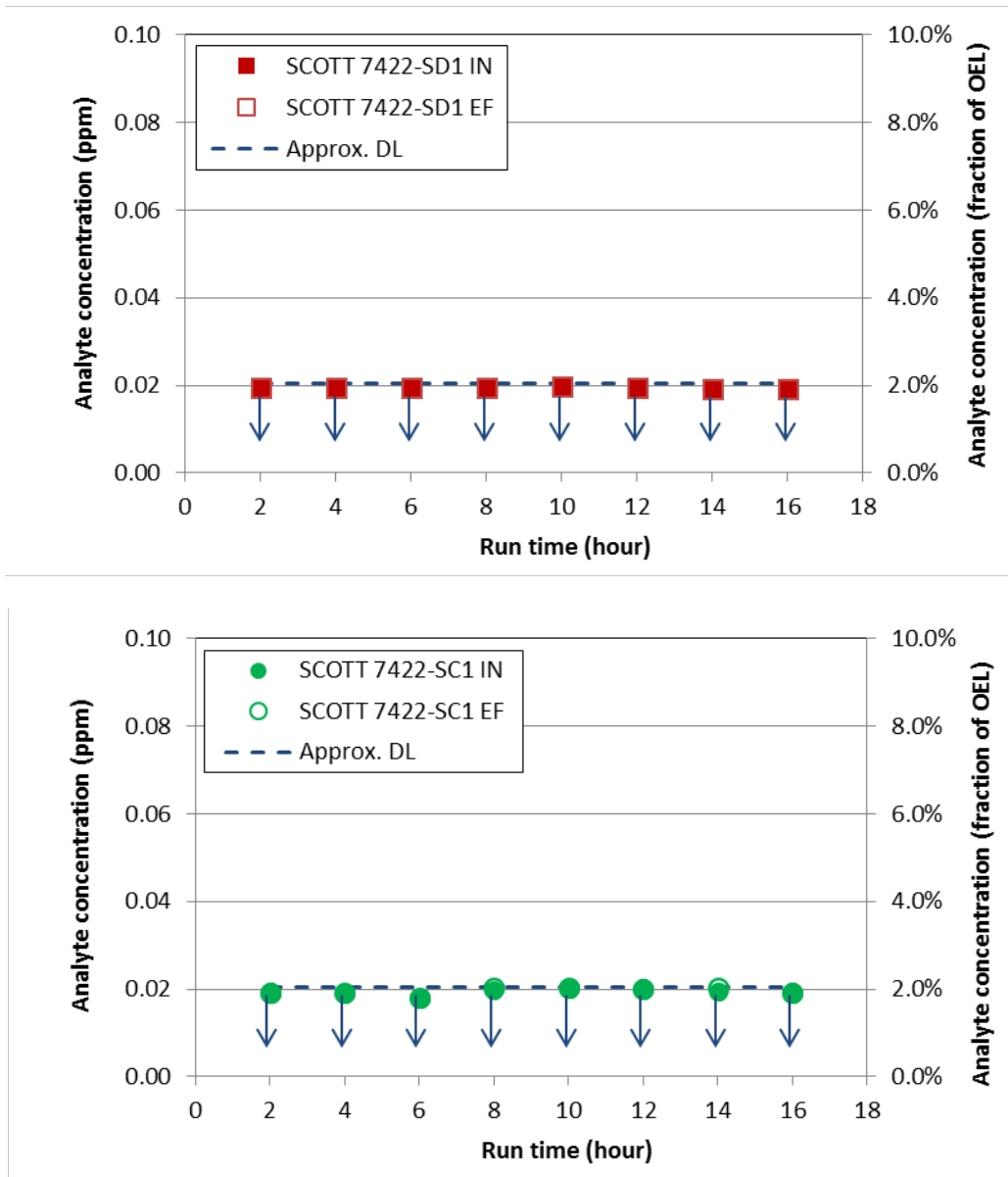
### Plots of Other COPCs with Significant (2–10% of the OEL) Detected Values

**Mercury** (see Figure E.1) – The detection limit (DL) for mercury corresponds to approximately 9.9% of the OEL. All inlet concentrations measured throughout the testing period for both cartridges were less than the analytical DL. Correspondingly, all outlet concentrations were below the DL, indicating no evidence of breakthrough over the measured time period for either cartridge tested.



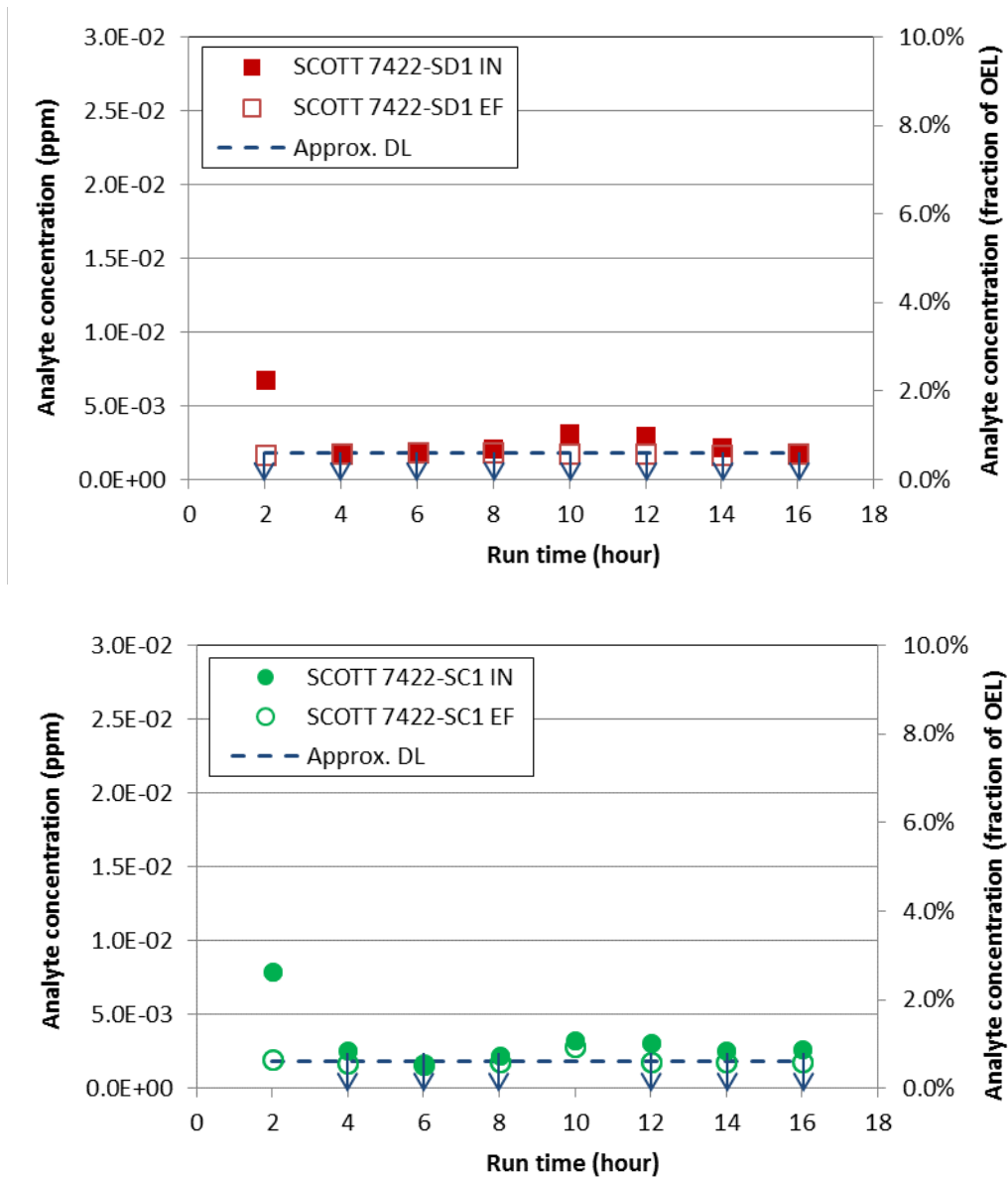
**Figure E.1.** Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

**1,3-Butadiene** (see Figure E.2) – The DL for 1,3-butadiene corresponds to approximately 2.0% of the OEL. All inlet and outlet concentration measurements were below the DL. Based on the data there is no evidence of breakthrough over the measured time period for either cartridge tested.



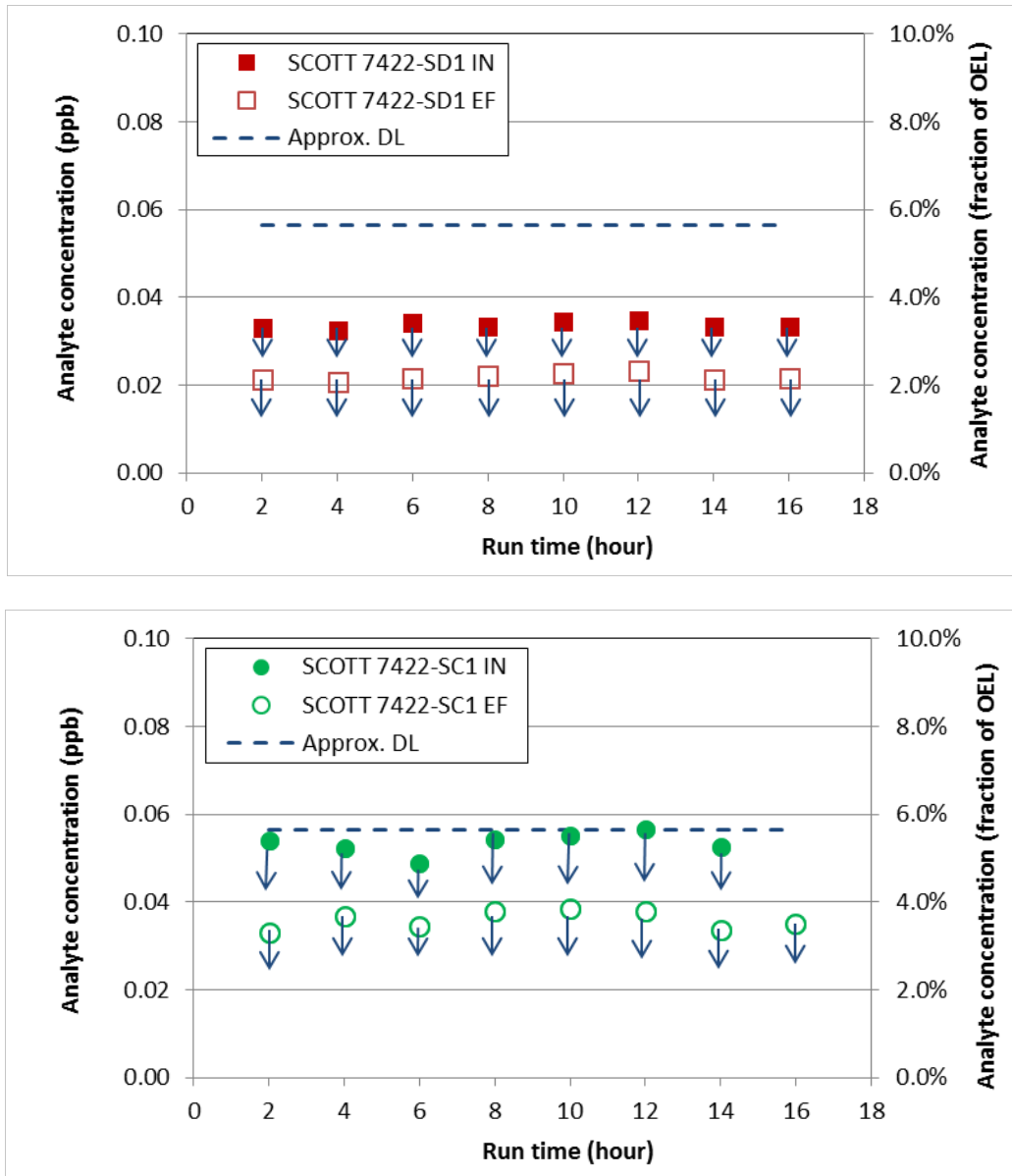
**Figure E.2.** Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL). Outlet data points not visible are obscured by the inlet data points.

**Formaldehyde** (see Figure E.3) – The DL for formaldehyde corresponds to approximately 0.6% of its OEL. All inlet and outlet values measured for both respirator cartridges were less than 10% of the OEL; specifically less than 2.7% of the OEL. The initial inlet concentrations measured throughout the testing period for both cartridges were higher than the DL at the beginning of each cartridge test but decreased after the first inlet measurement. The latter outlet measurements for both cartridges were all less than the DL. This same trend was observed in prior tank analyses, suggesting possible environmental background interference, but this root cause still needs to be confirmed. Nevertheless, all outlet concentrations were less than 1% of the OEL which is significantly lower than 10%. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



**Figure E.3.** Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

**Furan** (see Figure E.4) – The DL for furan corresponds to approximately 5.7% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL;<sup>1</sup> specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

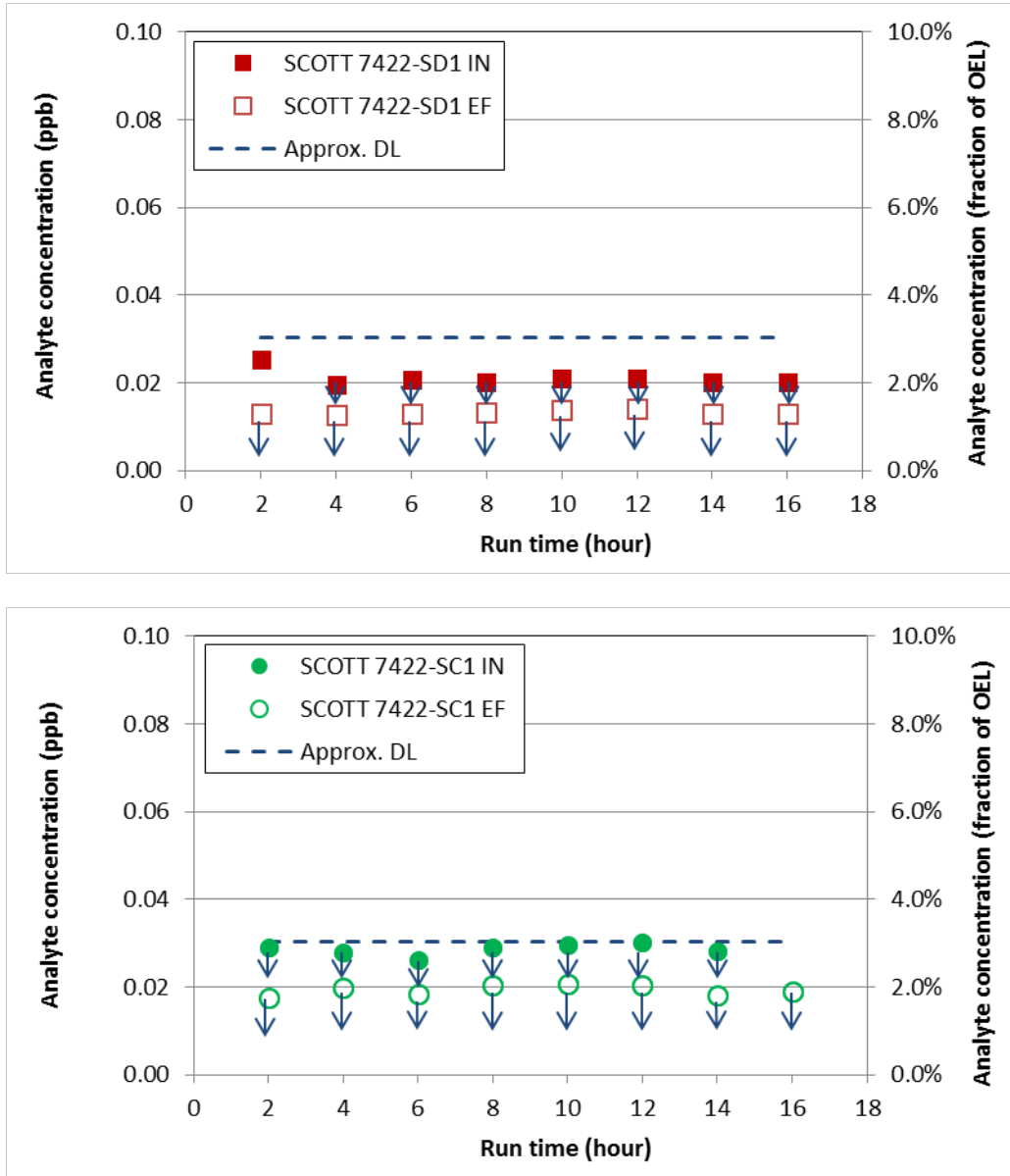


**Figure E.4.** Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

<sup>1</sup> Inlet concentration results for furan and all substituted furans for the 16-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

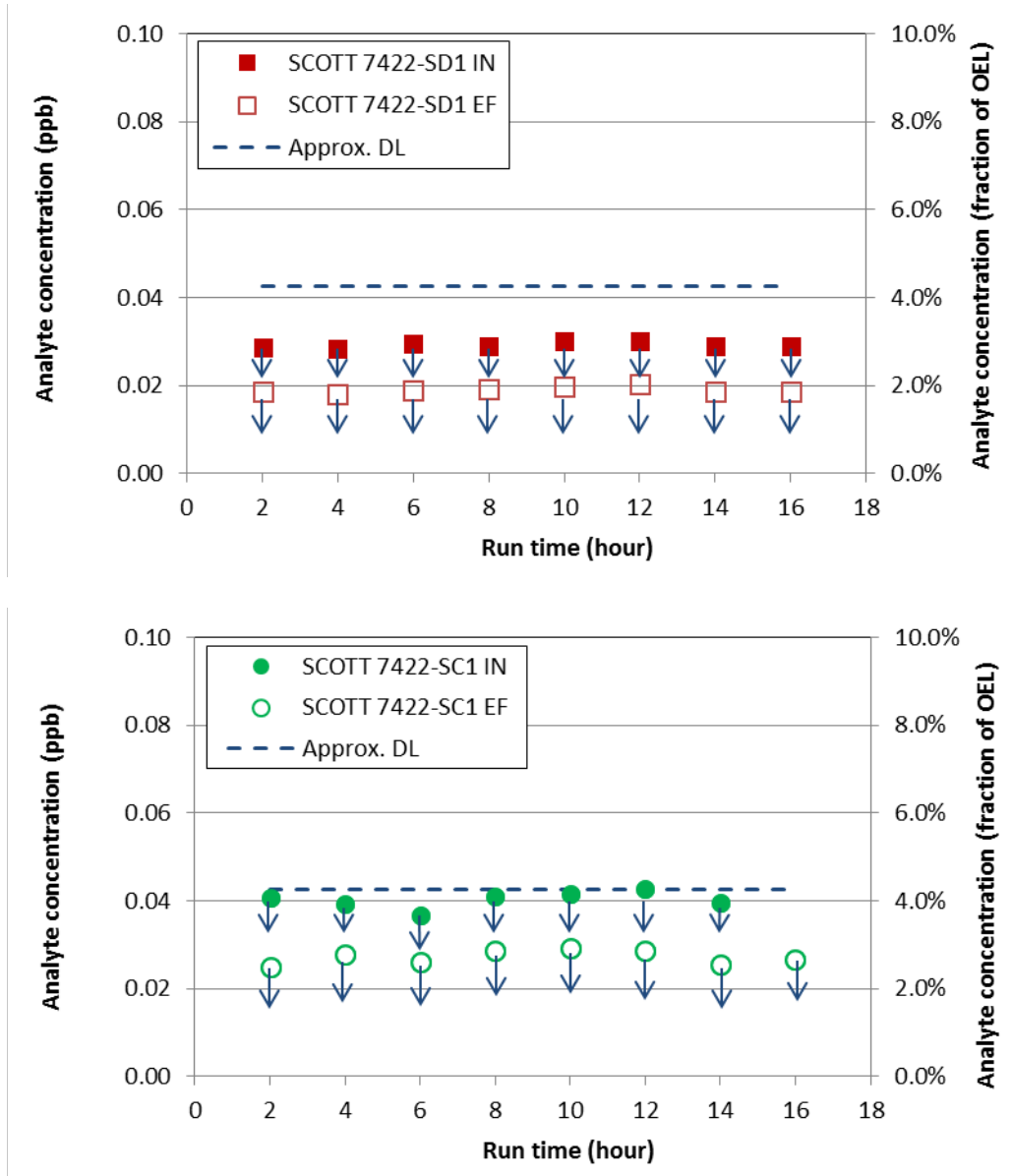


**2,3-Dihydrofuran** (see Figure E.5) – The DL for 2,3-dihydrofuran corresponds to approximately 3.0% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. One exception was the first inlet concentration (2 hour) for the SCOTT 7422-SD1 cartridge, which was greater than DL but still less than 3.0%. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



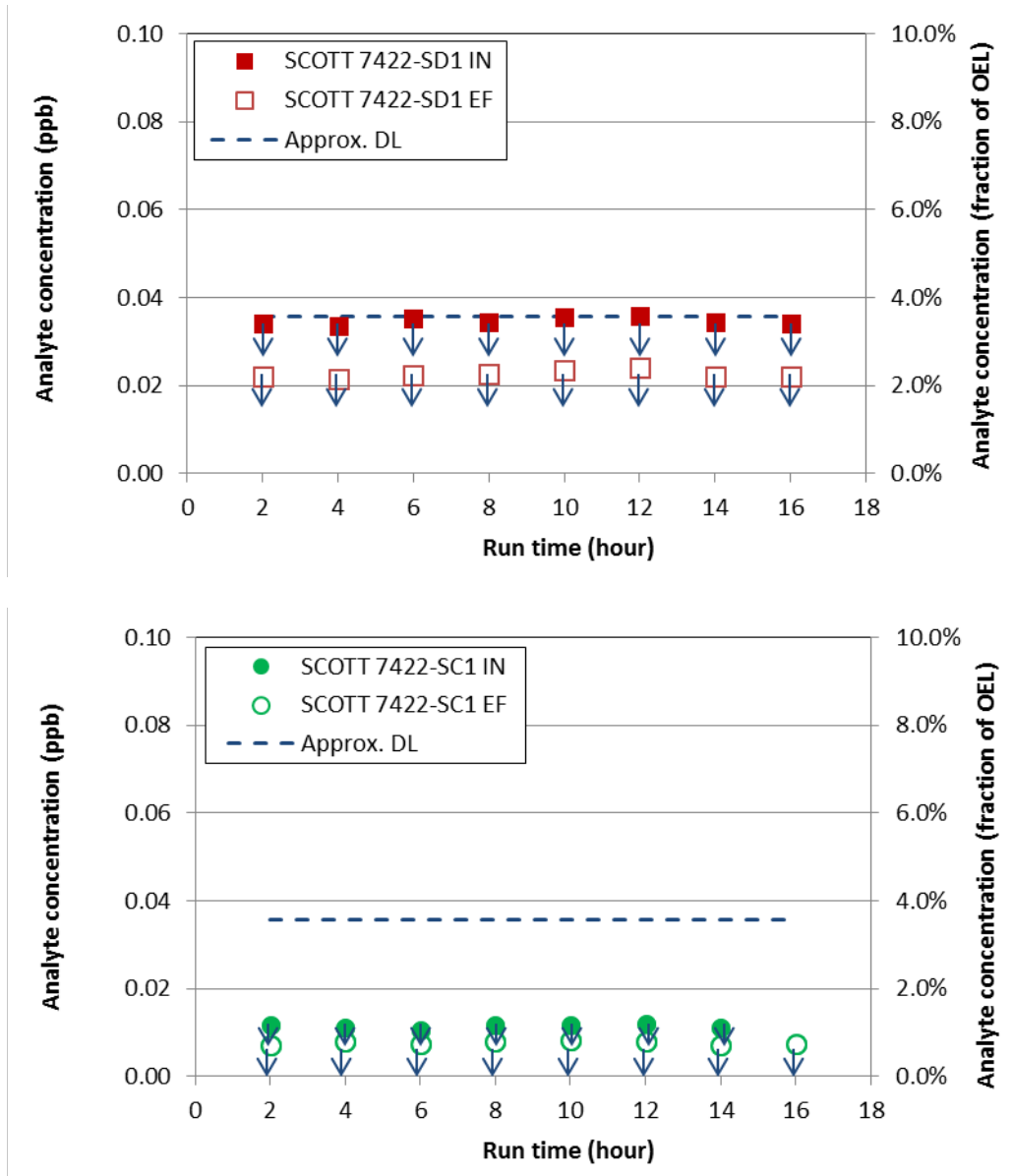
**Figure E.5.** Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2,5-Dihydrofuran** (see Figure E.6) – The DL for 2,5-dihydrofuran corresponds to approximately 4.3% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



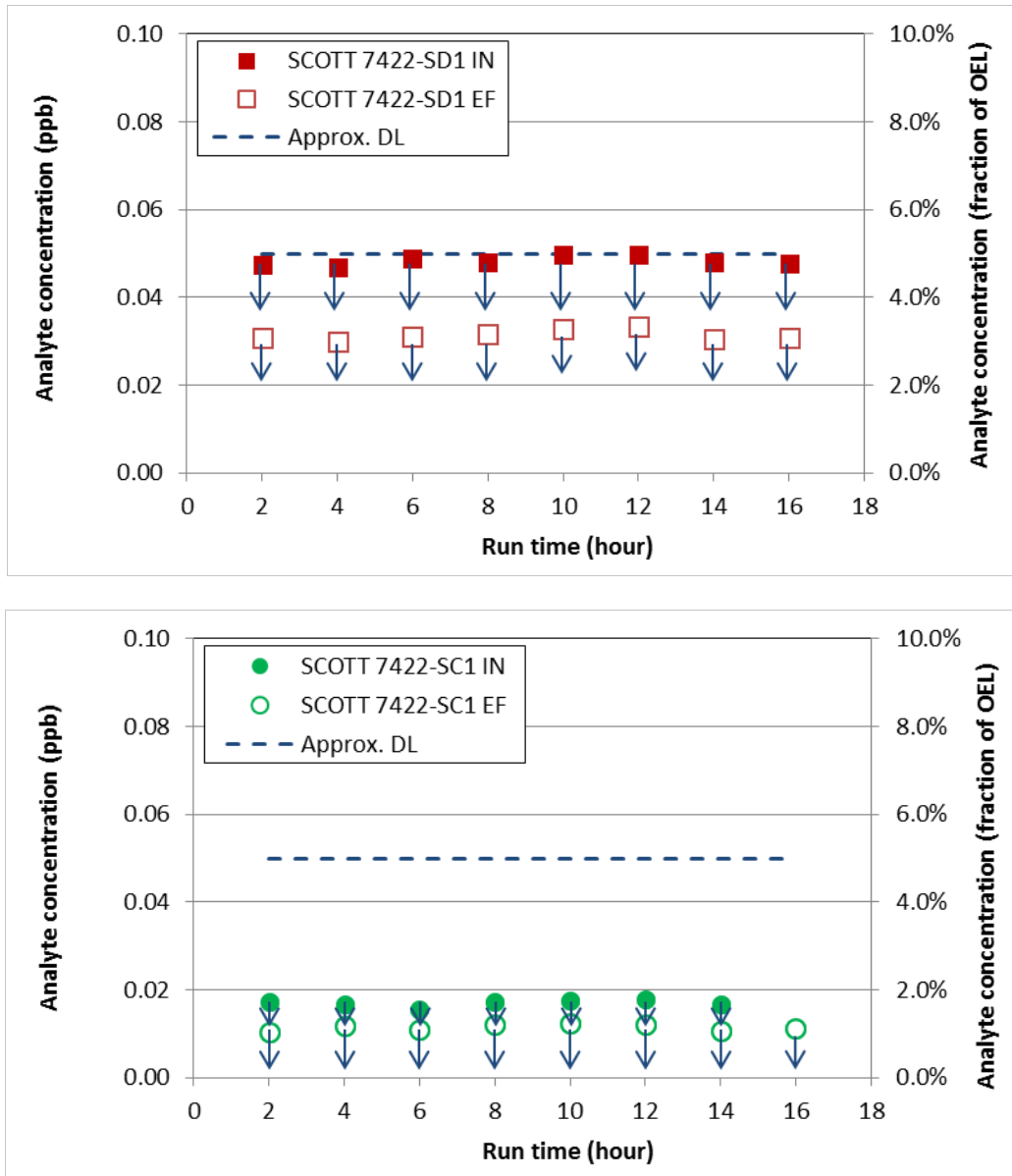
**Figure E.6.** Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2-Methylfuran** (see Figure E.7) – The DL for 2-methylfuran corresponds to approximately 3.6% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



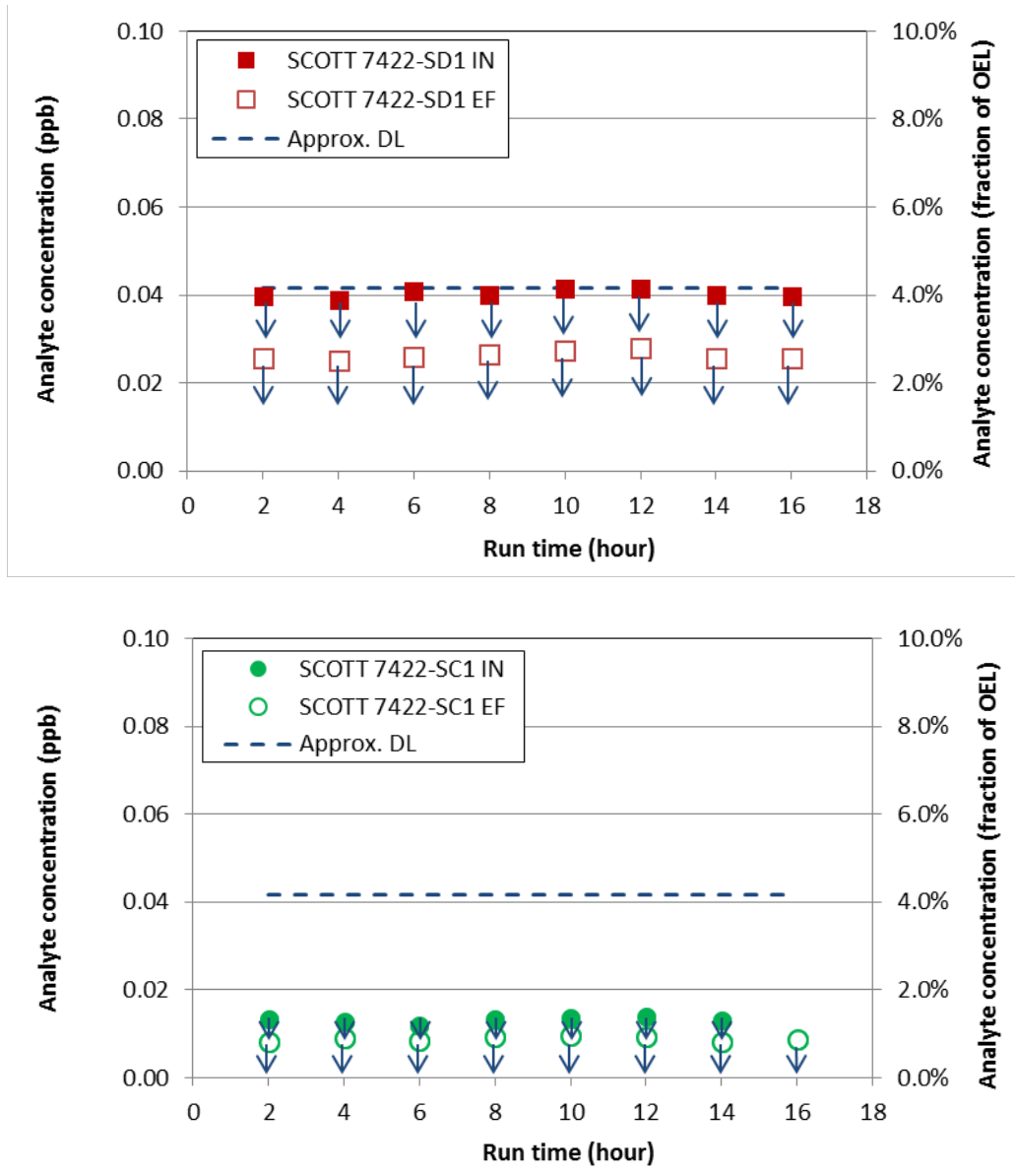
**Figure E.7.** Plot of Measured 2-Methylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2,5-Dimethylfuran** (see Figure E.8) – The DL for 2,5-dimethylfuran corresponds to approximately 5.0% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



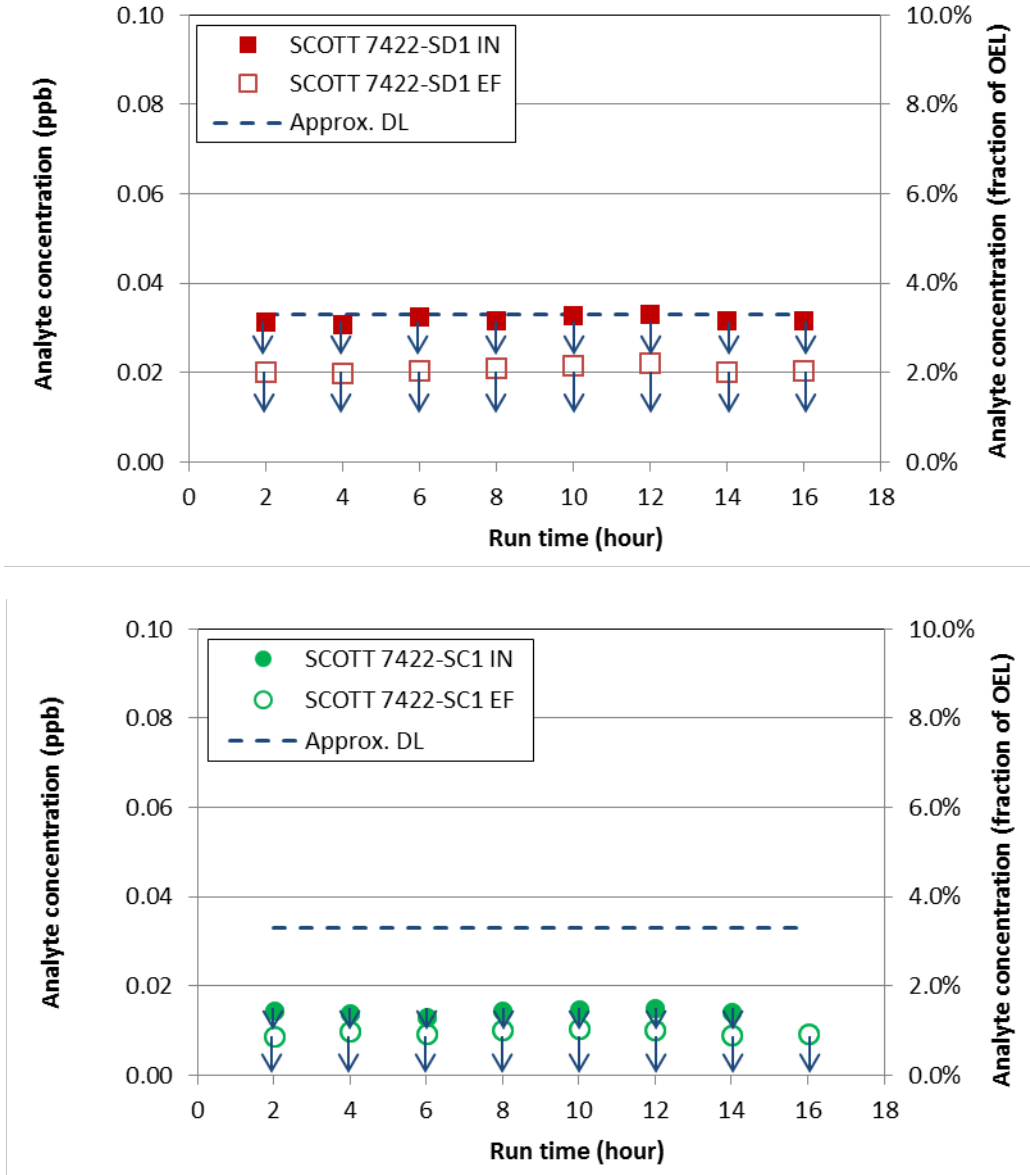
**Figure E.8.** Plot of Measured 2,5-Dimethylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2-Pentylfuran** (see Figure E.9) – The DL for 2-pentylfuran corresponds to approximately 4.2% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



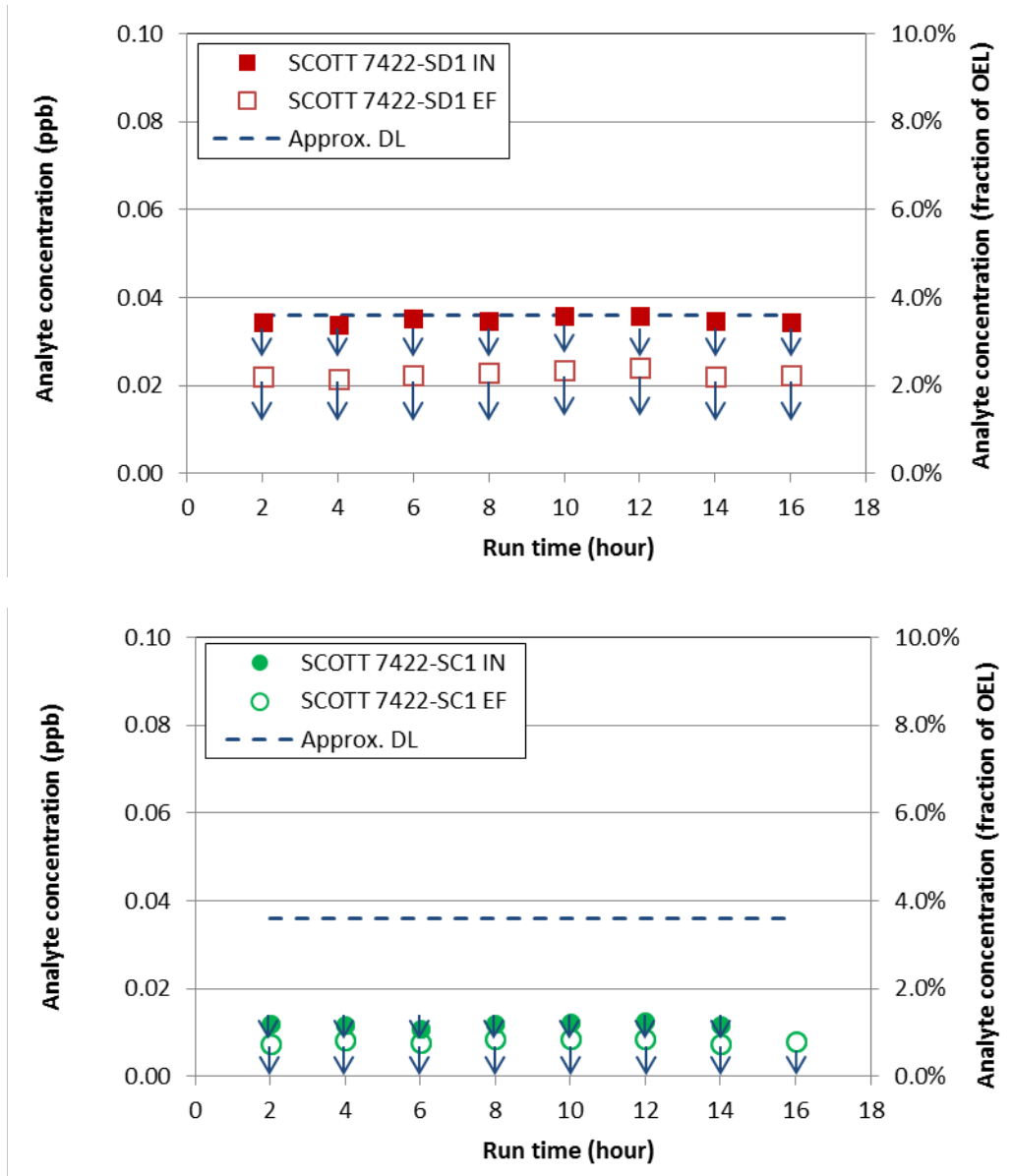
**Figure E.9.** Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2-Heptylfuran** (see Figure E.10) – The DL for 2-heptylfuran corresponds to approximately 3.3% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



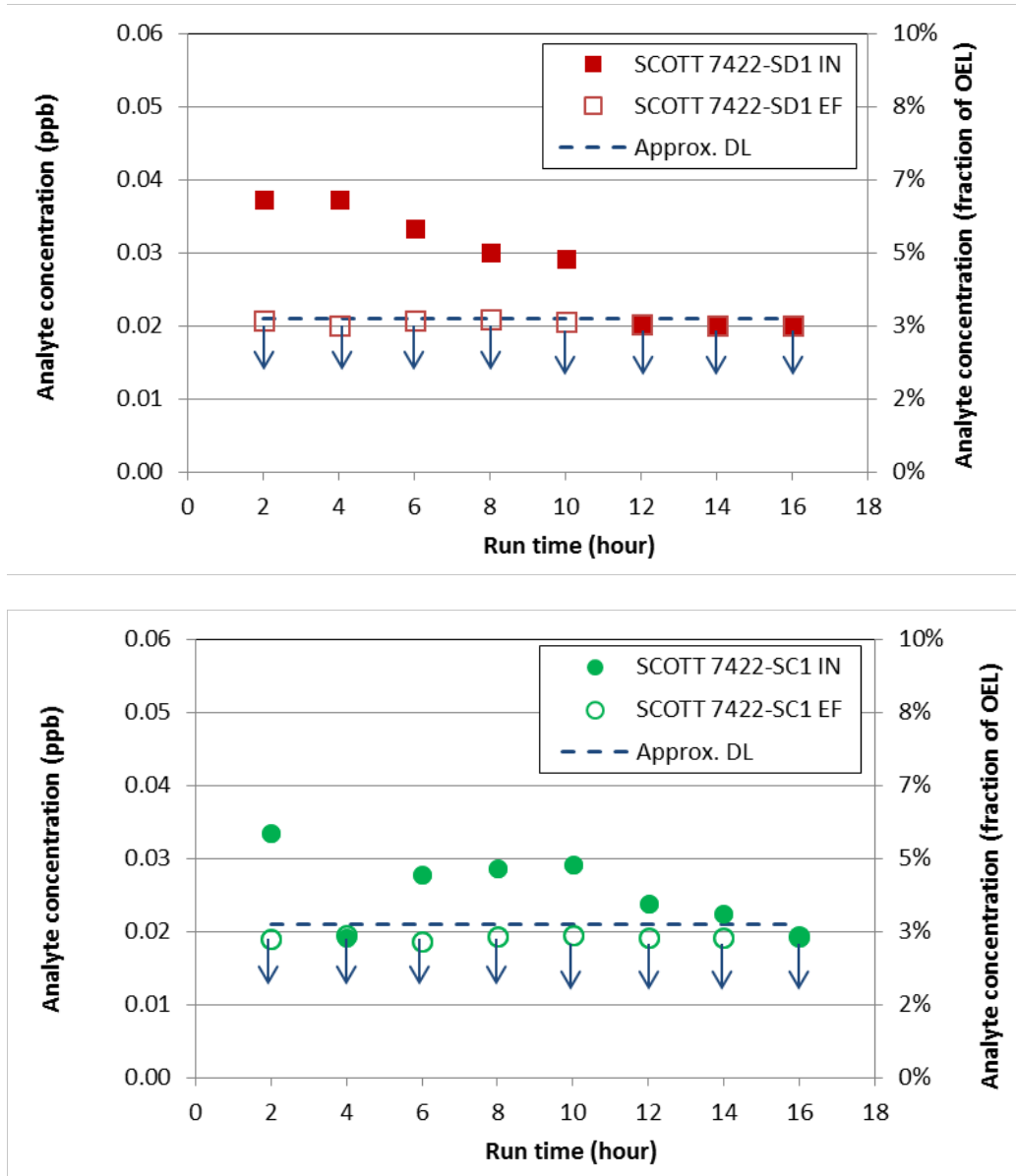
**Figure E.10.** Plot of Measured 2-Heptylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

**2-Propylfuran** (see Figure E.11) – The DL for 2-propylfuran corresponds to approximately 3.6% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



**Figure E.11.** Plot of Measured 2-Propylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

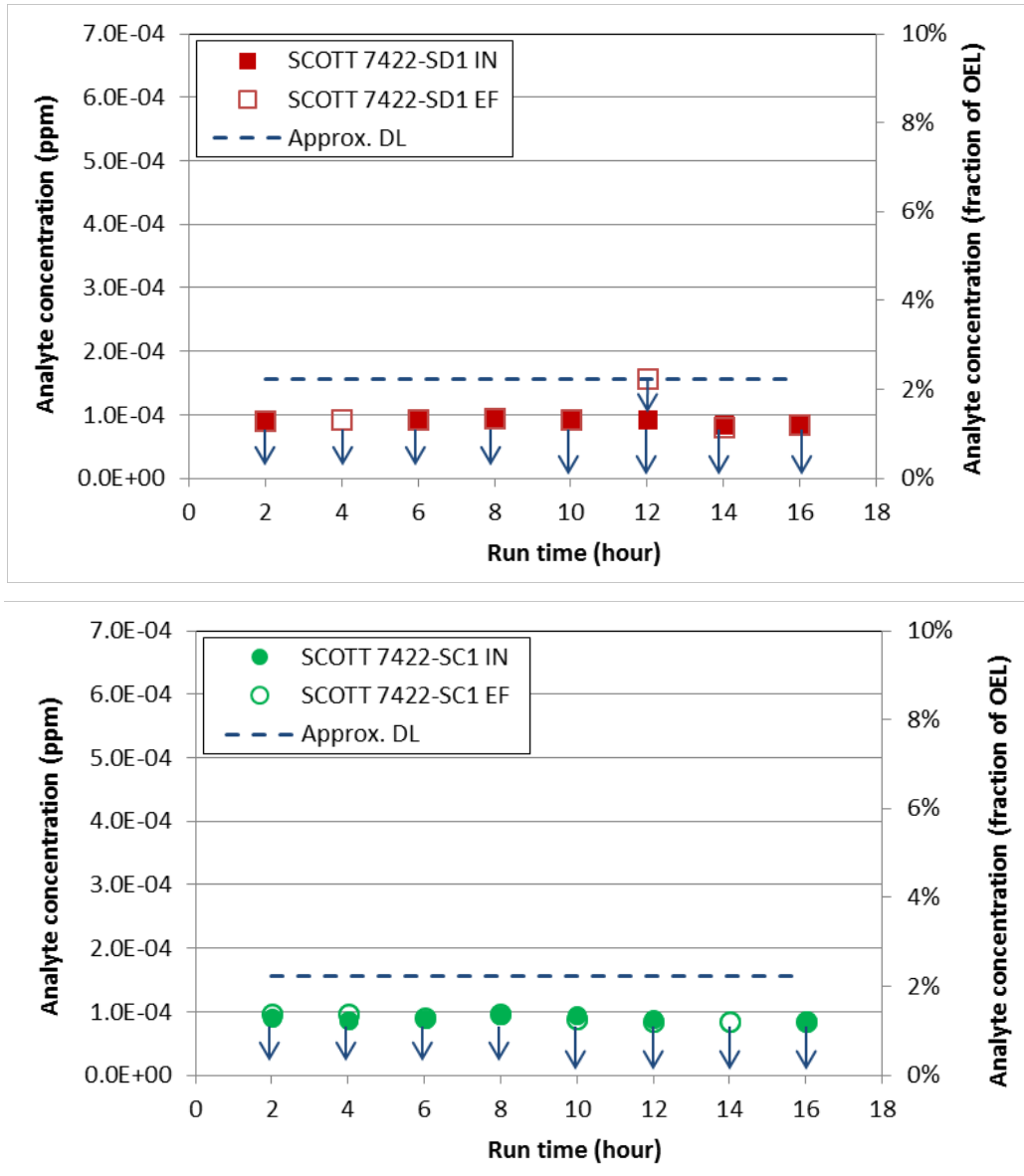
*N-Nitrosomorpholine* (see Figure E.12) – The DL for N-Nitrosomorpholine corresponds to approximately 3.5% of its OEL. The respirator cartridge inlet N-Nitrosomorpholine concentrations for both cartridges were as high 6.2% of the OEL at the beginning of testing and then decreased gradually, reaching the analytical DL by the end of testing for both cartridges. All outlet concentrations were less than the analytical reporting limit, indicating no breakthrough for either cartridge.



**Figure E.12.** Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.



**Dibutyl butylphosphonate** (see Figure E.13) – The DL for dibutyl butylphosphonate corresponds to approximately 2.2% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than 10% of the OEL; specifically less than the analytical DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.



**Figure E.13.** Plot of Dibutyl butylphosphonate Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.



## **Appendix F**

### **Historical Data Comparison**



## Appendix F

### Historical Data Comparison

Headspace-characterization data and industrial-hygiene (IH) data—hereafter referred to as “TWINS HS” and “TWINS IH”—were obtained from the Tank Characterization Database via the Tank Waste Information Network System (TWINS). All vapor analysis results for the AW exhaust were obtained via a TWINS query on June 20, 2016, for TWINS HS,<sup>(1)</sup> and another query on December 21, 2016, for TWINS IH. More recent headspace data were also obtained from the Site-Wide Industrial Hygiene Database (SWIHD) by a query on December 21, 2016, that obtained all headspace data that were present as of that date, producing a set referred to as “SWIHD HS.”

TWINS HS and TWINS IH data were eliminated from consideration if they were

- Quality Assurance samples (blanks, laboratory control samples, or spikes)
- Marked as suspect (Data Qualifier flag S)
- Associated with a contaminant in a blank, trip blank, or field blank (Data Qualifier flags B, T, or F)
- A laboratory control sample that was out of range (Data Qualifier flag a)
- An excessive relative percent difference (Data Qualifier flag c)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (Data Qualifier flags L or Y).

Flags a, c, and L were found only in the TWINS IH database, not in TWINS HS.

The exclusions for the SWIHD HS data set were similar:

- Having a laboratory control sample that was out of range (flag a)
- Associated with a contaminant in a blank (flags b or B)
- Having an excessive relative percent difference or relative standard deviation (flags c or d)
- Having an excessive difference between the sample result and its serial dilution (flag e)
- Having a failed mass spectrometer reading on the sample but not on its serial dilution (flag f)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (flags L or Y).

TWINS HS results associated with chemicals that were ambiguously identified (e.g., “alkane,” “unknown,” “C6 ketone”) were deleted unless the molecular weight of one of the chemicals could be unambiguously specified (e.g., “octanenitrile and others” was kept). In these mixture cases, where the Chemical ID consisted of a Chemical Abstracts Service (CAS) number followed by M, the molecular weight of the identified chemical was added to the data record, the CAS number was used for the

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<sup>1</sup> No data have been added to TWINS HS since April 2005, so the June 2016 download does not require updating.

Chemical ID, and the concentration expressed in parts per million (absent from the downloaded database) was calculated from the concentration in milligrams per cubic meter at 25°C and the molecular weight.

A number of chemicals in the TWINS IH data set had “needs conversion” notes in the concentration (mg/m<sup>3</sup> and ppm) columns, rather than numbers, and required calculations to supply these concentrations. The calculations made use of values already in the database: the molecular weight, the Reported Value and its units, and the Sample Volume and its units. A temperature of 25°C and a pressure of 1 atm were assumed.

The method described above was consistent with that used in PNNL-25880, except that measurements that were non-reports – less than the reporting limit (RL) for the analyte – were excluded in PNNL-25880 and were not excluded in this study.

For comparison to cartridge tests that were made using a gas stream from AW Stack, only exhaust measurements were appropriate. The TWINS HS database contained data identified as having the location “AW Ventilation”, which were included as part of this analysis. The SWIHD HS database contained no data for the AW stack. The TWINS IH database required sorting, as described below, so that only exhaust data were used.

The AW Farm data in the TWINS IH database that were used in analysis all had the location “Primary Exhauster” listed. Data where the location was an individual tank name, “CAM Cabinet”, or “Inside Farm” were not used. Survey titles for the “Inside Farm” location included descriptors such as “evaporator pot dump”, “motor housing”, or “inlet filter AWxxx”, none of which seemed relevant to in-stack concentrations. Of the data with location “Primary Exhauster”, all were used except for those whose survey title included “fan motor housing sampling.” The data that were used almost all had “stack” somewhere in the survey title.

Maximum and average<sup>(1)</sup> exhaust concentrations were found for each analyte for the combined TWINS IH and SWIHD HS databases.<sup>(2)</sup> These maxima and averages are given in Table F.1, together with Occupational Exposure Limits (OELs) and counts of the number of samples. The notation “n/a” is used where there were no measurements of the analyte.

Because the TWINS HS data were older, they were considered less representative of the vapors present during cartridge testing and the default was to omit them from calculations. However, in some cases the maximum and average for an analyte were considerably different if they were determined from a combination of all three databases. Whenever this was the case, the results for the three-database combination are tabulated along with those for the default two-database combination. That is, Table F.1 contains two rows for the chemical instead of one, with the upper row (the default two-database combination) in normal font and the lower row (the two-database combination) in italics. The two criteria for tabulating this extra information were (1) that at least one concentration for the chemical exceeded the OEL, and (2) that there was a significant difference between the value obtained from the two-database combination and that from the three-database combination. The significant difference could be either that there were data for the three-database set but no data for the two-database set (i.e., data only in TWINS HS), or that there was a difference of a factor of three or more, in either direction, between the value obtained from the two-database combination and that from the three-database combination.

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<sup>1</sup> Arithmetic average.

<sup>2</sup> Because the SWIHD HS database contained no stack data, the TWINS IH data were the only concentrations present in the two-database combination.

Because the reporting limits on concentrations in the historical database were generally higher than the reporting limits or detection limits in the cartridge tests, it was necessary to analyze data in a way that would let the effect of < RL historical data be recognized. To do this, it was assumed that all of the non-reports in the databases had concentrations equal to the measurements' RLs. Then the following rules were applied:

1. If a maximum value was a non-report, it was marked as "< RL" in the table.
2. If all the data contributing to an average were non-reports, the average was marked as "< RL".
3. If the presence of non-reports in an average caused it to be more than a factor of two different, in either direction, from the value it would have had if only the reported concentrations were averaged, the average was marked with an asterisk ("\*").

**Table F.1. COPC Comparison to Historical AW Exhauster Measurements**

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements <sup>1</sup>				Measurements in this study				
					Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL <sup>13</sup> (%OEL)
<i>Inorganic</i>													
1 Ammonia	7664-41-7	-28	Poling et al., 2007 <sup>2</sup>	25 ppm	25	161	39.5	644%	158%	106%	94%	16.6%	2.49% (RL)
2 Nitrous Oxide	10024-97-2	-127	Poling et al., 2007	50 ppm	2	11.3	8	23%	16%	Not Measured			
3 Mercury	7439-97-6	674	Poling et al., 2007	0.025 mg/m <sup>3</sup>	24	0.296	0.0292	1184%	117%	7.29%	6.91%	<RL	9.89% (RL)
<i>Hydrocarbons</i>													
4 1,3-Butadiene	106-99-0	24	Poling et al., 2007	1 ppm	27	<RL	0.0846	<RL	8.5%	<RL	<RL	<RL	2.03% (RL)
5 Benzene	71-43-2	176	Poling et al., 2007	0.5 ppm	22	<RL	0.0022*	<RL	0.44%*	0.044%	0.029%	<DL	0.026%
6 Biphenyl	92-52-4	491	Poling et al., 2007	0.2 ppm	19	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.14%
<i>Alcohols</i>													
7 1-Butanol	71-36-3	243	NIOSH	20 ppm	14	1.29	0.305	6.5%	1.5%	1.06%	0.83%	0.007%	0.004%
8 Methanol	67-56-1	148	Poling et al., 2007	200 ppm	17	<RL	0.829*	<RL	0.41%*	Not Measured			
<i>Ketones</i>													
9 2-Hexanone	591-78-6	262	NIOSH	5 ppm	22	<RL	0.00301	<RL	0.06%	0.005%	0.004%	<DL	0.003%
10 3-Methyl-2-butanone	814-78-8	208	CRC Handbook 1989 <sup>4</sup>	0.02 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC <sup>12</sup>			
11 4-Methyl-2-hexanone	105-42-0	282	Predicted ACD/Labs <sup>5</sup>	0.5 ppm	11	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.031%
12 6-Methyl-2-heptanone	928-68-7	333	Predicted ACD/Labs	8 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
13 3-Buten-2-one	78-94-4	179	CRC Handbook 1989	0.2 ppm	18	<RL	0.00257	<RL	1.3%	0.31%	0.26%	<DL	0.092%
<i>Aldehydes</i>													
14 Formaldehyde	50-00-0	-6	NIOSH	0.3 ppm	32	<RL	0.0215*	<RL	7.2%*	2.64%	1.01%	0.95%	0.61% (RL)
15 Acetaldehyde	75-07-0	69	NIOSH	25 ppm	17	<RL	0.0774*	<RL	0%*	0.068%	0.063%	0.047%	0.005% (RL)
16 Butanal	123-72-8	167	Oxford safety data <sup>6</sup>	25 ppm	30	<RL	0.0279*	<RL	0.11%*	0.009%	0.005%	<DL	0.001%
17 2-Methyl-2-butenal	1115-11-3	244	United Nations <sup>7</sup>	0.03 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
18 2-Ethyl-hex-2-enal	645-62-5	347	Predicted ACD/Labs	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			



**Table F.1. (continued)**

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements <sup>1</sup>				Measurements in this study				
					Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL <sup>13</sup> (%OEL)
<b>Furans</b>													
19 Furan	110-00-9	88	Poling et al., 2007	1 ppb	22	<RL	1.27	<RL	127%	<DL	<DL	<DL	5.65%
20 2,3-Dihydrofuran	1191-99-7	130	Alfa Aesar <sup>8</sup>	1 ppb	9	<RL	<RL	<RL	<RL	2.52%	<DL	<DL	3.03%
21 2,5-Dihydrofuran	1708-29-8	152	Aldrich <sup>9</sup>	1 ppb	22	<RL	0.576*	<RL	58%*	<DL	<DL	<DL	4.26%
22 2-Methylfuran	534-22-5	147	Oxford safety data	1 ppb	22	<RL	<RL	<RL	<RL	<DL	<DL	<DL	3.58%
23 2,5-Dimethylfuran	625-86-5	199	Alfa Aesar	1 ppb	8	<RL	<RL	<RL	<RL	<DL	<DL	<DL	4.99%
24 2-Ethyl-5-methylfuran	1703-52-2	246	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
25 4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	328	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	306	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
27 2-Pentylfuran	3777-69-3	333	Alfa Aesar	1 ppb	9	<RL	<RL	<RL	<RL	<DL	<DL	<DL	4.16%
28 2-Heptylfuran	3777-71-7	410	Alfa Aesar	1 ppb	8	<RL	<RL	<RL	<RL	<DL	<DL	<DL	3.31%
29 2-Propylfuran	4229-91-8	231	Alfa Aesar	1 ppb	9	<RL	<RL	<RL	<RL	<DL	<DL	<DL	3.60%
30 2-Octylfuran	4179-38-8	452	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	605	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not available	Not available	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC	Not Detected - TIC	Not Detected - TIC	
<b>Phthalates</b>													
33 Diethylphthalate	84-66-2	563	NIOSH	5 mg/m <sup>3</sup>	17	0.0196	0.00251	0.39%	0.05%	<DL	<DL	<DL	0.062%

**Table F.1. (continued)**

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements <sup>1</sup>					Measurements in this study			
					Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL <sup>1,3</sup> (%OEL)
<b>Nitriles</b>													
34 Acetonitrile	75-05-8	179	NIOSH	20 ppm	18	0.385	0.0823	1.9%	0.41%	0.50%	0.078%	1.28%	0.001%
35 Propanenitrile	107-12-0	207	NIOSH	6 ppm	18	<RL	0.00219	<RL	0.04%	0.006%	0.005%	<DL	0.004%
36 Butanenitrile	109-74-0	244	NIOSH	8 ppm	17	<RL	0.00246	<RL	0.03%	0.003%	0.002%	<DL	0.003%
37 Pentanenitrile	110-59-8	284	Alfa Aesar	6 ppm	17	0.00495	0.000861*	0.08%	0.01%*	<DL	<DL	<DL	0.004%
38 Hexanenitrile	628-73-9	328	Predicted ACD/Labs	6 ppm	17	0.00757	0.00134*	0.13%	0.02%*	0.002%	0.002%	<DL	0.003%
39 Heptanenitrile	629-08-3	368	Alfa Aesar	6 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
40 2-Methylene butanenitrile	1647-11-6	Not available	Not available	0.3 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
41 2,4-Pentadienenitrile	1615-70-9	278	Predicted ACD/Labs	0.3 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
<b>Amines</b>													
42 Ethylamine	75-04-7	62	Poling et al., 2007	5 ppm	17	0.609	0.0644*	12%	1.3%*	<RL	<RL	<RL	0.099% (RL)
<b>Nitrosamines</b>													
43 N-Nitrosodimethylamine	62-75-9	306	NIOSH	0.3 ppb	24	6.49	2.89	2163%	963%	1638%	1399%	<RL	10.7% (RL)
44 N-Nitrosodiethylamine	55-18-5	351	Oxford safety data	0.1 ppb	24	<RL	0.1*	<RL	100%*	<RL	<RL	<RL	23.8% (RL)
45 N-Nitrosomethylethylamine	10595-95-6	310	Predicted ACD/Labs	0.3 ppb	24	<RL	0.12*	<RL	40%*	14.0%	11.8%	<RL	9.18% (RL)
46 N-Nitrosomorpholine	59-89-2	435	Oxford safety data	0.6 ppb	24	<RL	0.0917*	<RL	15%*	6.22%	4.50%	<RL	3.48% (RL)
<b>Organophosphates</b>													
47 Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	19	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.11%
48 Dibutyl butylphosphonate	78-46-6	602	Predicted ACD/Labs	0.007 ppm	19	<RL	<RL	<RL	<RL	<DL	<DL	<DL	2.23%
<b>Halogenated</b>													
49 Chlorinated Biphenyls	Varies	Varies	Varies	1 mg/m <sup>3</sup>	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
50 2-Fluoropropene	1184-60-7	-11	SynQuest <sup>11</sup>	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			

**Table F.1. (continued)**

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements <sup>1</sup>				Measurements in this study			
					Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)
<b>Pyridines</b>												
51 Pyridine	110-86-1	240	NIOSH	1 ppm	29	<RL	0.0125	<RL	1.3%	<RL	<RL	0.035% (RL)
52 2,4-Dimethylpyridine	108-47-4	318	Alfa Aesar	0.5 ppm	28	<RL	0.00887*	<RL	1.8%*	<RL	<RL	0.052% (RL)
<b>Organonitriles</b>												
53 Methyl nitrite	624-91-9	10	Oxford safety data	0.1 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
54 Butyl nitrite	544-16-1	172	Alfa Aesar	0.1 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
<b>Organonitrates</b>												
55 Butyl nitrate	928-45-0	276	Predicted ACD/Labs	2.5 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
56 1,4-Butanediol, dinitrate	3457-91-8	499	Predicted ACD/Labs	0.05 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
57 2-Nitro-2-methylpropane	594-70-7	260	Alfa Aesar	0.3 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	338	Predicted ACD/Labs	0.05 ppm	0	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC	
<b>Isocyanates</b>												
59 Methyl isocyanate	624-83-9	103	NIOSH	0.02 ppm	1	<RL	<RL	<RL	<RL	<RL	Not Detected - TIC	

<sup>1</sup> Historical data from TWINS industrial hygiene vapor database and SWIH database; see text for links and dates of queries. Values in italics include those data plus data from the TWINS headspace database, all samples earlier than May 2005.

\* indicates that the value of the average would differ by a factor of 2 or more (in either direction) if non-reports were excluded.

"<RL" indicates that all pertinent measurements of the analyte were less than the reporting limit

Plain font in the table indicates that only the recent databases (SWIHD headspace and TWINS Industrial Hygiene) were included. Italics mean that the pre-2006 TWINS headspace data were also included.

"n/a" indicates no historical data was found in the databases

<sup>2</sup> Poling, B. E.; Prausnitz, J. M.; O'Connell, J. P. *The Properties of Gases and Liquids*. McGraw Hill, 2007.

<sup>3</sup> NIOSH: National Institute of Occupational Safety and Health

<sup>4</sup> CRC Handbook of Chemistry and Physics, CRC Press, 1989.

<sup>5</sup> ACD/Labs software <http://www.acdlabs.com/products/percepta/predictors.php>

<sup>6</sup> Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

<sup>7</sup> Food and Agriculture Organization of the United Nations

<sup>8</sup> Alfa Aesar: <https://www.alfa.com/>

<sup>9</sup> Aldrich: <https://www.sigmaaldrich.com/>

<sup>10</sup> OSHA: Occupational Safety and Health Administration

<sup>11</sup> SynQuest: <http://synquestlabs.com/product/id/8330.html>

<sup>12</sup> TIC: Tentatively Identified Compounds that were not observed in this study using the specified analytical methods.

<sup>13</sup> Approximate Detection Limit (DL) is calculated using the reported detection limit (or reporting limit) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.



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