



Analysis of Respirator Cartridge Performance Testing on Hanford Tank AX-101

July 2020

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PACIFIC NORTHWEST NATIONAL LABORATORY
operated by
BATTELLE
for the
UNITED STATES DEPARTMENT OF ENERGY
under Contract DE-AC05-76RL01830

Printed in the United States of America

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Prepared for
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Executive Summary

Washington River Protection Solutions conducted tests on two types of chemical cartridges for use in air purifying respirators (APR) to determine the period of time that the cartridges would provide adequate performance¹ for APRs used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from vapors emanating from the headspace of tank AX-101 on the Hanford Site. The Occupational Safety and Health Administration (OSHA) identifies cartridge testing as a valid approach for establishing cartridge change schedules.[3] 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 9–11, 2016, using headspace vapors from Hanford tank AX-101 under static conditions fed to a respirator cartridge test stand developed by Washington River Protection Solutions 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. Key conclusions from the assessment of the 59 COPCs in this study are described below:

- Based on measured cartridge inlet vapor concentrations from tank AX-101 headspace, only two COPCs, ammonia and N-nitrosodimethylamine (NDMA), exceeded their corresponding Occupational Exposure Limits (OEL).² Six COPCs—mercury, formaldehyde, furan, 2,3-dihydrofuran, N-nitrosomethylethylamine, and N-nitrosomorpholine—were found to have one or more inlet concentration measurements >10% of their corresponding OELs, but <100% of their OELs. All other COPCs inlet and outlet measurements did not exceed 10% of their OELs, except for acetonitrile with a single outlet measurement at 21% of its OEL and N-nitrosodiethylamine with all inlet and outlet measurements below the detection limit (DL)³ of ~23% of the OEL.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 801% of the OEL (200 ppm) during the testing, which was higher than average and maximum historical headspace measurements. For both cartridges tested, ammonia appeared to breakthrough above 10% of its OEL after 2 hours.

¹ “Adequate performance” refers to being below the breakthrough criteria used in this analysis. The breakthrough criteria for this analysis is having sustained cartridge outlet concentrations above 10% of the compound’s OEL. Ultimately, Industrial Hygiene professionals will use these results along with specific hazard assessments to determine service life, change schedules, and cartridge use that provides the necessary performance.

² OELs 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 based on the best available science. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

³ The term “detection limit” is used here to refer either to an analytical reporting limit (RL) or a 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 Appendix F for additional information on the specific use of RLs or DLs for each COPC.

- Cartridge inlet concentration measurements for NDMA reached 932% of its OEL (2.8 ppb), which was higher than average and maximum historical headspace concentrations. All outlet concentrations of NDMA were less than the analytical reporting limit of ~11% of its OEL, except for the final measurement at 16 hours on SCOTT 7422-SC1, which indicated a concentration equivalent to the 14-hour inlet concentration. Sampling error is suspected in this case, possibly the result of swapping the inlet and outlet samples. The other nitrosamines indicated a similar issue. There is no indication of breakthrough for SCOTT 7422-SD1, and the suspect data point for SCOTT 7422-SC1 also provides no compelling indication of breakthrough.
- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant, up to 24% of the OEL, which is comparable to historic AX-101 measurements. Respirator outlet concentrations for mercury were all below its DL, except for the last outlet concentration for SCOTT 7422-SC1 at 16% of the OEL, indicating potential breakthrough after 14 hours of testing.
- Formaldehyde inlet concentrations reached a maximum early in the cartridge test period of ~10% and 14% for SCOTT 7422-SD1 and SCOTT 7422-SC1, respectively, and then declined to less than its DL. All outlet measurements were less than or slightly above the DL, indicating no breakthrough for the test period.
- The respirator cartridge inlet concentrations measured by the Tenax tube method for both furan⁴ and 2,3-dihydrofuran varied from a maximum of 15% and 44% of their OELs, respectively, to less than their DLs. All historic data for these two furan compounds in AX-101 were less than the reporting limit. All outlet concentrations for both cartridges were less than their DLs except for the 16-hour measurement on the SCOTT 7422-SC1 cartridge for both furan and 2,3-dihydrofuran, which showed detectable concentrations of 6.2% and 10% of their OELs, respectively. These data indicate the potential that breakthrough initiated after 14 hours for this cartridge; however, this data point was flagged as having a flow issue that could have contributed to data error.
- A single acetonitrile outlet concentration measurement reached ~20.8% of its OEL for the SCOTT 7422-SC1 cartridge test at 8 hours. The high value could either be due to an error in the single concentration measurement or an error in handling the sample. All other inlet and outlet measurements for these COPCs never exceeded 10% of the OEL, specifically less than 2.5%, indicating no breakthrough.
- Several respirator inlet concentration measurements for N-nitrosomethylethylamine and N-nitrosomorpholine were slightly above their DLs, but less than 16% and 15% of their OELs, respectively. All outlet concentrations were less than the DLs, except for the final measurement at 16 hours on SCOTT 7422-SC1, which showed an elevated outlet concentration more consistent with the preceding inlet concentration at 14 hours. Sampling error is suspected in this case, possibly the result of swapping the inlet and outlet samples. There is no indication of breakthrough for either cartridge at or above the 10% of OEL limit.

⁴ After initial publication of this report (Rev. 0), it was determined that an alternate analytical method using Carbotrap 300 TDUs provided more accurate results. Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 and 16.4% of the OEL for the 7422-SC1 cartridge. Still, furan breakthrough was not observed on either cartridge. The re-evaluation of furans using the Carbotrap 300 TDU is discussed in PNNL-26821 (Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2020. *Overview of 2016 through 2018 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*. PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington).

Based on the measurements taken for this study, breakthrough occurred early in the test sequence for ammonia. Ammonia breakthrough occurred after 2 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). This experimental result supports a 2-hour service life for the use of SCOTT 7422-SC1 and 7422-SD1 cartridges in APRs employed to protect workers at Hanford tank AX-101. However, variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact breakthrough time, especially if OEL thresholds are exceeded. In these circumstances, additional respirator cartridge evaluations may be necessary to determine proper respiratory protection requirements. The inlet ammonia concentrations are close to the upper limits recommended by the Centers for Disease Control and Prevention-National Institute for Occupational Safety and Health recommendations for APR use.⁵

The *Overview of 2016 through 2018 Testing of Air-Purifying Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*, Freeman et.al. [19], provides additional information on the use of the cartridge testing results for the first 28 cartridge tests with the manufacturers service life models.⁶

⁵ CDC-NIOSH Pocket Guide to Chemical Hazards – Ammonia. Available at <https://www.cdc.gov/niosh/npg/npgd0028.html>.

⁶ Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2020. *Overview of 2016 through 2018 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*. PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington

Revision History

Revision Number	Effective Date	Description of Change
0		Initial issue
1	January 2020	<p>This report has been revised to address external peer review comments on the Rev. 0 report and subsequent test reports from 2016 cartridge testing and to correct data reporting errors. The principal changes included:</p> <ol style="list-style-type: none"> Addressing several external peer review comments including: <ul style="list-style-type: none"> Referencing the <i>Overview of 2016 through 2018 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters</i>,⁷ which provided additional information on historic Chemical of Potential Concern source concentrations and the significance of any differences between cartridge-testing results and historic maxima. Adding descriptive information to Appendices A, B, and C to provide additional clarity on the contents and methods applied. Clarifying terminology regarding breakthrough time vs. service life and change-out schedule. A furans analytical methods review was conducted 2018 (“Assessment of the Use of Alternate Furan Measurements for Respirator Cartridge Performance Determinations,” letter report 69802-01). The assessment recommended the use of the Carbotrap 300 TDU tube analytical results for furan, 2,5-dihydrofuran, and 2-methylfuran in lieu of the TDU Tenax TA tube. All furan, 2,5-dihydrofuran, and 2-methylfuran results for the 2016 air purifying respirator cartridge testing have been re-evaluated and documented in Appendix F of PNNL-26821, Revision 1. Therefore values for furan, 2,5-dihydrofuran, and 2-methylfuran have not been updated in this revision of the report. <p>Inlet concentrations for furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 results were similar to those documented in this report.⁸ No breakthrough of these furan compounds was observed during either cartridge tested.</p>

⁷ Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2020. *Overview of 2016 through 2018 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*, PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington.

⁸ Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 and below the detection limit (17.4% of the OEL) for the 7422-SC1 cartridge. Inlet and effluent concentration measurements for 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU Method were all below detection limits. Breakthrough was not observed on either cartridge.

Acronyms and Abbreviations

ALS	ALS Environmental Salt Lake City
APR	Air Purifying Respirator
CAS	Chemical Abstracts Service
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 Limit
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
IH	Industrial Hygiene
NDEA	N-Nitrosodiethylamine
NDMA	N-Nitrosodimethylamine
NIOSH	National Institute of Occupational Safety and Health
NMEA	N-Nitrosomethylethylamine
OEL	Occupational Exposure Limit
OSHA	Occupational Safety and Health Administration
ppm	Parts Per Million
PNNL	Pacific Northwest National Laboratory
RL	Reporting Limit
SAR	Supplied Air Respirator
SCBA	Self-Contained Breathing Apparatus
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 life 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 analyses of cartridge testing on vapors from the headspace of Hanford AX-101 single-shell waste tank.

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 (greater than 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 (approximately 30-pound), 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 change-out schedules.[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 estimated service life of different cartridges for specific chemical compounds. Manufacturers also should be able to provide the exact objective information they used to estimate 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 waste 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. Over the years OSHA and NIOSH have worked 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 (canisters/cartridges) 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:

- Number of cartridges used by the respirator
- Mass of the sorbent used in each cartridge
- Carbon micro-pore volume
- Density of the packed bed
- Maximum temperature
- Maximum relative humidity
- 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 greater than 70°C and the concentration is less than 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 drivers⁹ can help in interpreting the results obtained from experimental testing of respirator cartridges.

⁹ The general drivers (a.k.a., rules of thumb) are applicable to certain compounds but not to all compounds in a mixture, such as those in specific Hanford tank mixtures. However, an Industrial Hygiene professional can use these rules of thumb to support interpretation of results from both experiments and predictions.

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 AX-101 tank.[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 test stands to the tank farms.

The APR cartridge test assembly was designed and constructed to operate to the following environmental conditions without negatively impacting system performance:

- 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.

WRPS developed a testing program with the following conservative conditions to support robust cartridge service life estimates:

- 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 vapor source sampling was performed on headspace or exhaust stack 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. ¹⁰[16] These cartridges were chosen because they can capture 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) concentration measurements were recorded every 2 hours during the 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 >10% of their OELs 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.

¹⁰ SCOTT part numbers 7422-SC1 and 7422-SD1 are multipurpose respirator cartridges for use on Xcel half-mask and all SCOTT full facepieces with NIOSH approval for OV/AM/MA/CL/HF/CD/CD/HF/FM/HS application. The -SD1 cartridge has the same multipurpose features as the -SC1, but also includes a P100 particulate filter. <https://www.3m-scott.com/download/742-series-cartridges-user-instructions-english/>

4.0 Data Analysis

Respirator cartridge testing on the AX-101 tank was conducted from September 9–11, 2016. Each cartridge was tested for approximately 16 hours of continuous run time. Testing and analysis 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 analysis. Appendix C provides the raw data for all of contaminants analyzed during the tests, and Appendix D provides the corresponding calculated concentrations for the detected COPCs. Appendix C also gives the average temperatures of the sample slipstream during testing, which ranged from 54 to 93°F, and the average relative humidity that ranged from 42 to 85%. 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.

Table 1 shows the measured concentrations for all COPCs tested in the current study. This table further provides a summary of the test information. For example, if all of the measurements for a specific compound were less than detection limits (DL), that compound is marked accordingly. Further, if concentrations were detected for a compound, the extent of the detection also is described. Inlet concentrations of two COPCs, ammonia and N-nitrosodimethylamine (NDMA), exceeded their corresponding OELs. Inlet (or outlet) concentrations of seven additional COPCs were lower than their corresponding OELs but still exceeded 10%. These COPCs were mercury, formaldehyde, furan, 2,3-dihydrofuran, acetonitrile, N-nitrosomethylethylamine (NMEA) and N-nitrosomorpholine. In addition, inlet and outlet concentrations for N-nitrosodiethylamine (NDEA) were identified as being >10% of the OEL. However, these values were below the analytical DL for that compound in all cases, which corresponds to ~23% of the OEL. As such, the concern threshold for NDEA was increased from 10% of the OEL to the analytical DL. These 10 COPCs are highlighted in yellow in Table 1 and are discussed in more detail in Section 5.0.

Appendix E shows similar detailed assessments for an additional seven COPCs with respirator cartridge inlet (or outlet) concentrations or DLs less than 10% but >2% of the OEL. These COPCs were 1,3-butadiene, 2,5-dihydrofuran, 2-methylfuran, 2,5-dimethylfuran, 2-pentylfuran, 2-heptylfuran and 2-propylfuran. All of the other COPCs had inlet (or outlet) concentrations or DLs less than 2% or their OELs.¹¹

¹¹ The term “detection limit” is used here to refer either to analytical reporting limit (RL) or DL. The use of either an RL or DL varied among analytical laboratories. The 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 Appendix F for additional information on the specific use of RLs or DLs 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 ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Inorganic						
1 Ammonia	7664-41-7	200 ppm	25 ppm	2.56%		Up to 801% of OEL for inlet values. All outlets <767%.
2 Nitrous Oxide	10024-97-2	Not Measured	50 ppm			
3 Mercury	7439-97-6	6.07 ug/m3	25 ug/m3	7.33%		Up to 24.3% of OEL for inlet values. All outlets <16.3%.
Hydrocarbons						
4 1,3-Butadiene	106-99-0	0.0205 ppm	1 ppm	2.05%	X	
5 Benzene	71-43-2	0.0009 ppm	0.5 ppm	0.021%		Up to 0.2% of OEL for inlet values. All outlets <0.09%.
6 Biphenyl	92-52-4	0.0002 ppm	0.2 ppm	0.096%	X	
Alcohols						
7 1-Butanol	71-36-3	0.0633 ppm	20 ppm	0.004%		Up to 0.3% of OEL for inlet values. All outlets <0.15%.
8 Methanol	67-56-1	Not Measured	200 ppm			
Ketones						
9 2-Hexanone	591-78-6	0.0031 ppm	5 ppm	0.002%		Up to 0.06% of OEL for inlet values. All outlets <0.03%.
10 3-Methyl-2-butanone	814-78-8	Not Detected	0.02 ppm	TIC ²	X	
11 4-Methyl-2-hexanone	105-42-0	0.0001 ppm	0.5 ppm	0.017%		Up to 0.02% of OEL for inlet values. All outlets <DL.
12 6-Methyl-2-heptanone	928-68-7	Not Detected	8 ppm	TIC	X	
13 3-Buten-2-one	78-94-4	0.0034 ppm	0.2 ppm	0.083%		Up to 1.7% of OEL for inlet values. All outlets <0.5%.
Aldehydes						
14 Formaldehyde	50-00-0	0.0431 ppm	0.3 ppm	0.63%		Up to 14.4% of OEL for inlet values. All outlets <0.7%.
15 Acetaldehyde	75-07-0	0.105 ppm	25 ppm	0.005%		Up to 0.4% of OEL for inlet values. All outlets <0.3%.
16 Butanal	123-72-8	0.0042 ppm	25 ppm	0.001%		Up to 0.02% of OEL for inlet values. All outlets <0.01%.
17 2-Methyl-2-butanal	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	

¹ Approximate DL is calculated using the reported DLs (or RLs) from the analytical laboratory and the average volume (from flowrate × time) of vapor exposed to the sorbent tube.

² A TIC entry (Tentatively Identified Compound) 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 ≥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.

³ Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 and less than the DL (17.4% of the OEL) for the 7422-SC1 cartridge. Inlet and effluent concentration measurements for 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU Method were all below detection limits. Breakthrough was not observed on either cartridge.

Table 1. (continued)

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
<i>Furans</i>³						
19 Furan	110-00-9	0.15 ppb	1 ppb	3.61%		Up to 14.7% of OEL for inlet values. All outlets <6.2%.
20 2,3-Dihydrofuran	1191-99-7	0.44 ppb	1 ppb	2.14%		Up to 43.6% OEL for inlet values. All outlets <10.4%.
21 2,5-Dihydrofuran	1708-29-8	0.04 ppb	1 ppb	3.13%		All inlet values <DL. All outlets <4.0%
22 2-Methylfuran	534-22-5	0.04 ppb	1 ppb	3.72%	X	
23 2,5-Dimethylfuran	625-86-5	0.05 ppb	1 ppb	5.19%	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	0.06 ppb	1 ppb	4.33%		Up to 6.3% of OEL for inlet values. All outlets <4.5%.
28 2-Heptylfuran	3777-71-7	0.03 ppb	1 ppb	3.44%		All inlet values <DL. All outlets <2.7%.
29 2-Propylfuran	4229-91-8	0.04 ppb	1 ppb	3.74%	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	
<i>Phthalates</i>						
33 Diethylphthalate	84-66-2	0.0021 mg/m ³	5 mg/m ³	0.042%	X	
<i>Nitriles</i>						
34 Acetonitrile	75-05-8	4.15 ppm	20 ppm	0.002%		Up to 2.6% of OEL for inlet values. All outlets <20.8%.
35 Propanenitrile	107-12-0	0.0096 ppm	6 ppm	0.003%		Up to 0.16% of OEL for inlet values. All outlets <0.08%.
36 Butanenitrile	109-74-0	0.0051 ppm	8 ppm	0.002%		Up to 0.06% of OEL for inlet values. All outlets <0.03%.
37 Pentanenitrile	110-59-8	0.0014 ppm	6 ppm	0.002%		Up to 0.02% of OEL for inlet values. All outlets <0.01%.
38 Hexanenitrile	628-73-9	0.0102 ppm	6 ppm	0.002%		Up to 0.2% of OEL for inlet values. All outlets <0.002%.
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 ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Amines						
42 Ethylamine	75-04-7	0.0049 ppm	5 ppm	0.098%	X	
Nitrosamines						
43 N-Nitrosodimethylamine	62-75-9	2.80 ppb	0.3 ppb	11.2%		Up to 932% of OEL for inlet values. All outlets <644%.
44 N-Nitrosodiethylamine	55-18-5	0.02 ppb	0.1 ppb	23.2%	X	All inlet and outlet values <DL (23.2% of OEL)
45 N-Nitrosomethylethylamine	10595-95-6	0.05 ppb	0.3 ppb	8.95%		Up to 15.5% of OEL for inlet values. All outlets <9.0%.
46 N-Nitrosomorpholine	59-89-2	0.09 ppb	0.6 ppb	3.40%		Up to 14.4% of OEL for inlet values. All outlets <7.9%.
Organophosphates						
47 Tributyl phosphate	126-73-8	0.16 ppb	200 ppb	0.078%	X	
48 Dibutyl butylphosphonate	78-46-6	0.11 ppb	7 ppb	1.51%	X	
Halogenated						
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m ³	TIC	X	
50 2-Fluoropropene	1184-60-7	Not Detected	0.1 ppm	TIC	X	
Pyridines						
51 Pyridine	110-86-1	2.40 ppb	1000 ppb	0.036%		Up to 0.2% of OEL for inlet values. All outlets <0.09%.
52 2,4-Dimethylpyridine	108-47-4	0.23 ppb	500 ppb	0.046%	X	
Organonitrites						
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	
Organonitrates						
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	
Isocyanates						
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 two COPCs—ammonia and NDMA—had measurements that exceeded their OELs. Eight additional COPCs—mercury, formaldehyde, furan, 2,3-dihydrofuran, acetonitrile, NDEA, NMEA, and N-nitrosomorpholine—had measured concentrations or DLs less than their corresponding OELs but >10% of their OELs (see COPCs highlighted in yellow in Table 1). This section provides more detail on these 10 COPCs, along with plots of the corresponding data. Note that Appendix E shows plots and descriptions for other COPCs with measured concentrations or DLs between 2% and 10% of their corresponding OELs.

Ammonia (see Figure 1) – The DL for ammonia corresponds to ~2.6% of the OEL. Inlet concentrations were measured every two hours throughout the testing period. The highest measured value recorded for the SCOTT 7422-SD1 cartridge test was 801% of the OEL. Outlet concentrations for this cartridge exceeded 10% of the OEL after 2 hours of testing, specifically reaching 168% within 4 hours and remained above 340% of the OEL for all subsequent sample times. Outlet concentrations measured for the SCOTT 7422-SC1 cartridge also exceeded 10% of the OEL after 4 hours of testing, specifically exceeding 152% of the OEL. These measurements clearly indicate breakthrough after 2 hours for both the cartridges tested.

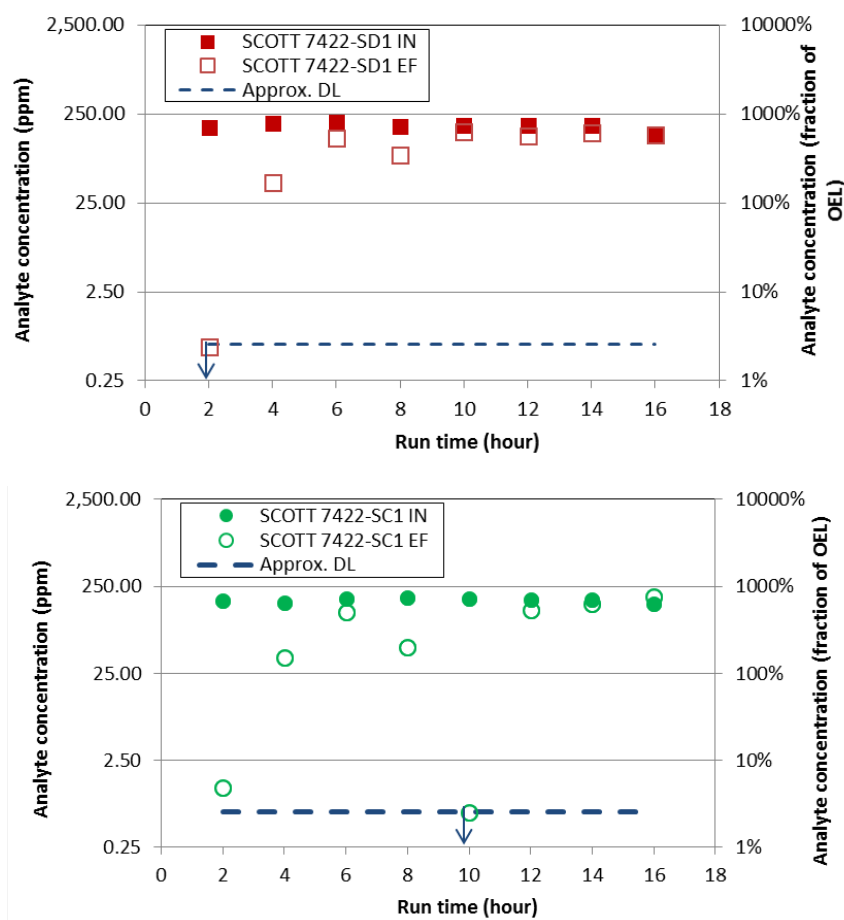


Figure 1. Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Mercury (see Figure 2) – The DL for mercury corresponds to ~7.3% of the OEL. Inlet concentrations for mercury measured throughout the testing period for both cartridges remained relatively similar, with the highest value recorded at 24% of the OEL for SCOTT 7422-SD1. All measured outlet concentrations for cartridge SCOTT 7422-SD1 were below the DL. All measured outlet concentrations for cartridge SCOTT 7422-SC1 were also below the DL, except for the last outlet concentration at 16% of the OEL, indicating potential breakthrough of mercury on that cartridge at the end of the testing period. Note that for this higher outlet concentration, the corresponding inlet was the lowest of any inlet measurement for mercury. This could indicate a sampling or analysis error due to swapped inlet and outlet sorbent tube samples for the 16-hour data set, although this could not be confirmed.

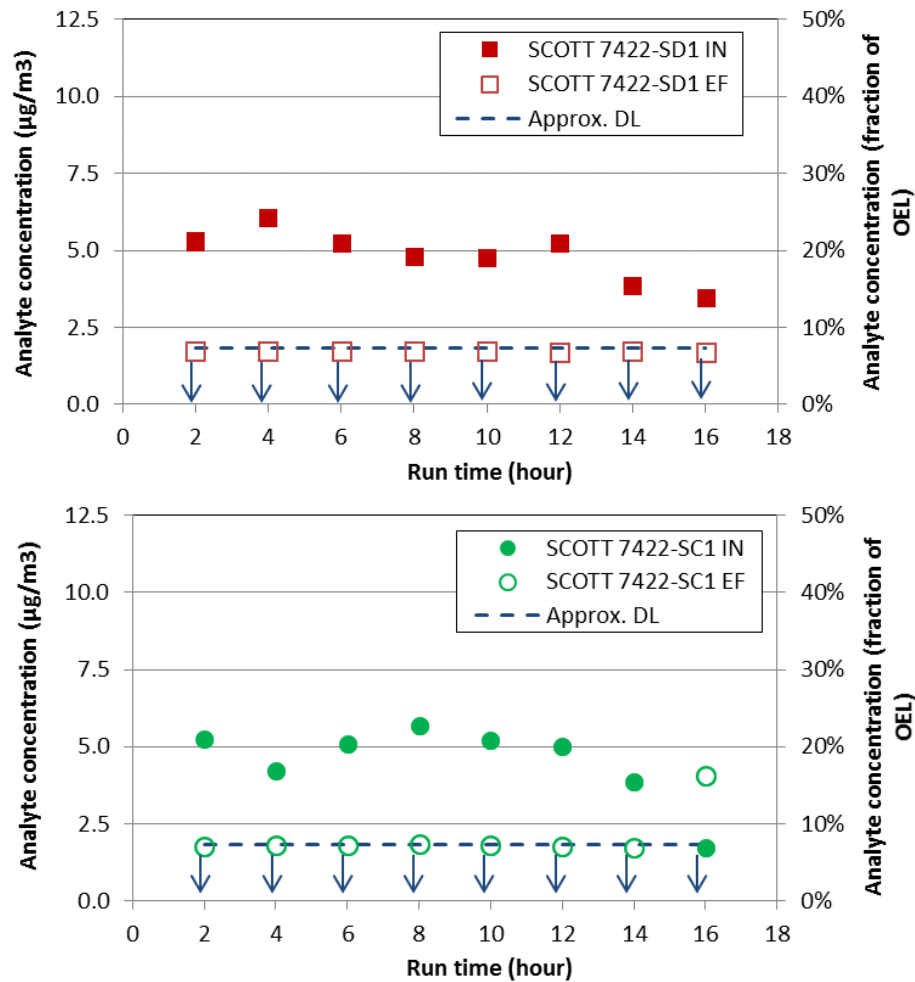


Figure 2. Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Formaldehyde (see Figure 3) – The DL for formaldehyde corresponds to ~0.6% of its OEL. The inlet concentrations measured throughout the testing period for both cartridges were higher than DLs for several early measurements but were at the DL for the last three. The outlet measurements for both cartridges were less than the DLs except for a single measurement (the 4-hour data point for the SCOTT 7422-SD1 cartridge) that was slightly above the DL. Based on this data there is no evidence of breakthrough over the measured time period for either cartridge tested.

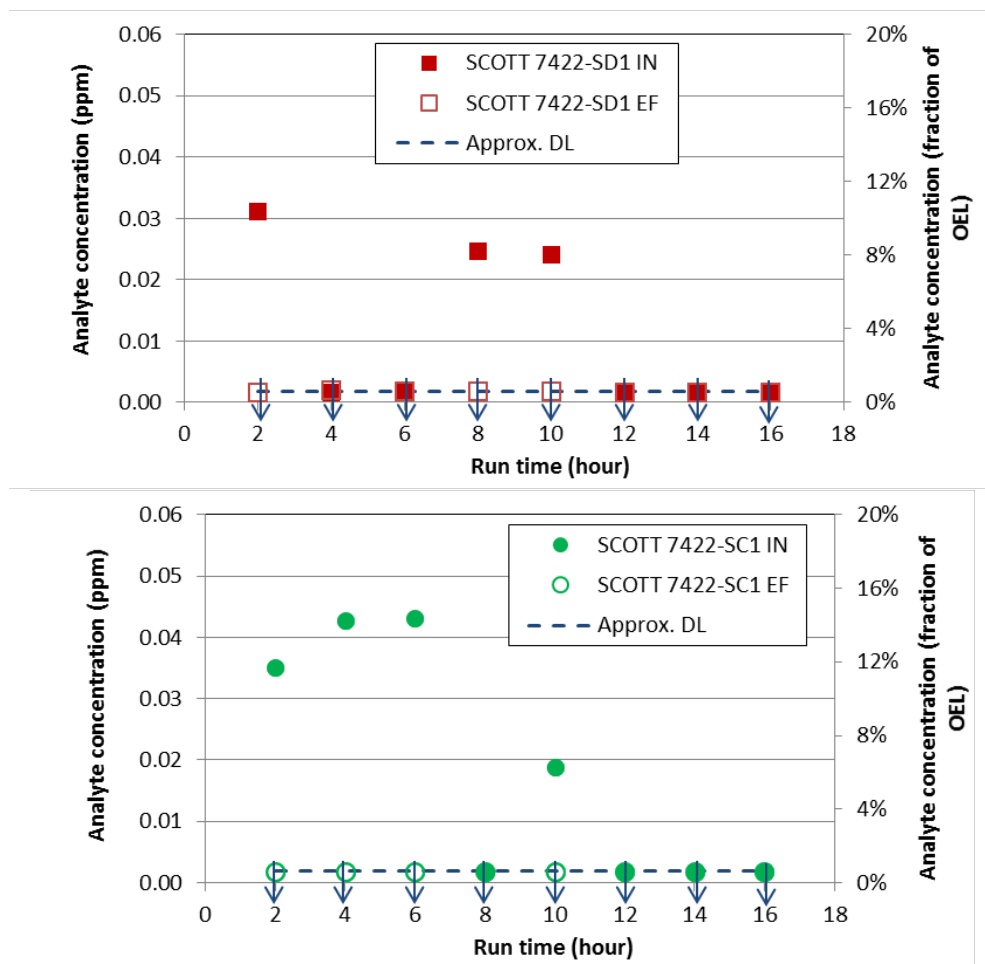


Figure 3. Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet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

Furan (see Figure 4) – The DL for furan corresponds to ~3.6% of its OEL. All inlet and outlet values measured for SCOTT 7422-SD1 cartridge were less than 10% of the OEL, specifically less than the DL.¹² The inlet concentrations measured for SCOTT 7422-SC1 cartridge were >10% of the OEL earlier in the testing but decreased to the DL by the end of testing. The second inlet measurement for SCOTT 7422-SC1 cartridge represented the highest concentration at 15% of the OEL. The measured outlet concentrations were below the DL except for the last outlet concentration for SCOTT 7422-SC1 at 6.2% of the OEL. This single measurement may indicate the beginning of breakthrough for furan on the SCOTT 7422-SC1 cartridge. However, this may also be a result of sampling error given that the flowrate through the sample tube for this data point was flagged as suspect. There was no evidence of breakthrough for the SCOTT 7422-SD1 cartridge.¹³

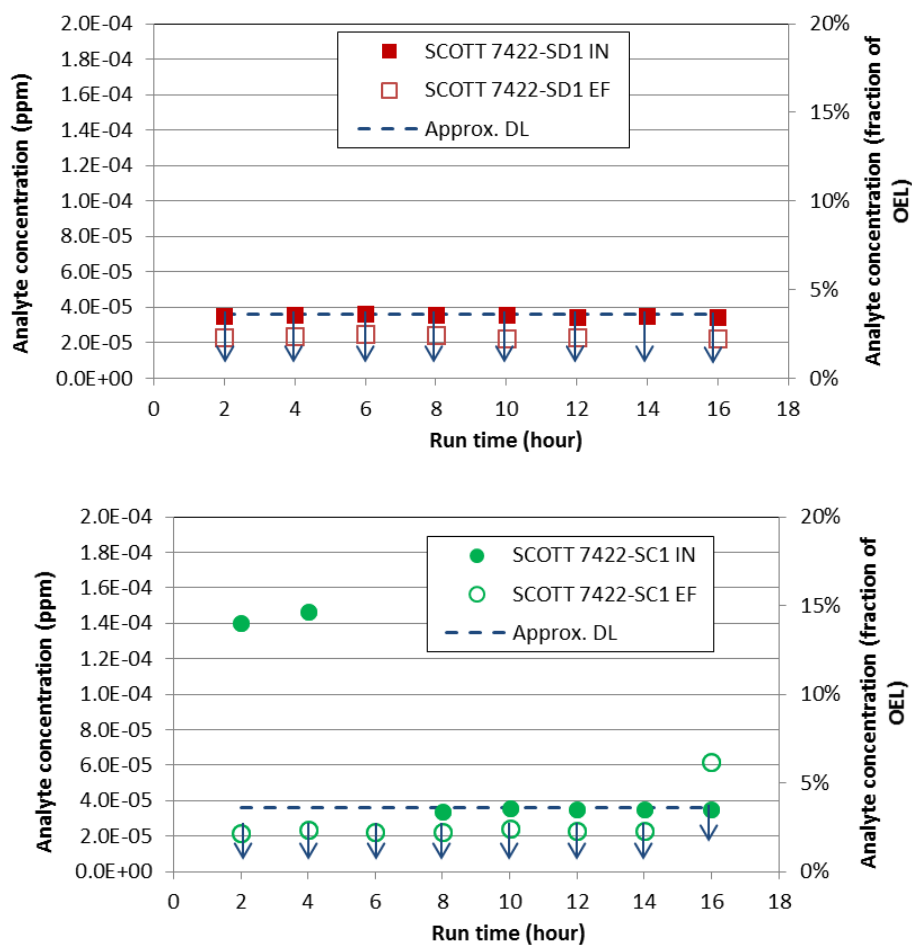


Figure 4. Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

¹² Inlet concentration results for furan and all substituted furans for the 14-hour period (SCOTT 7422-SD1) and 6-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

¹³ Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 and below the DL (17.4% of the OEL) for the 7422-SC1 cartridge.

2,3-Dihydrofuran (see Figure 5) – The DL for 2,3-dihydrofuran corresponds to ~2.1% of its OEL. The inlet concentrations measured for the SCOTT 7422-SD1 cartridge were at or >20% of the OEL earlier in the testing but decreased to near the DL by the end of testing. All measured outlet concentrations for the SCOTT 7422-SD1 cartridge were below the DL, thus there is no evidence of breakthrough over the measured time period for that cartridge. In the case of SCOTT 7422-SC1 cartridge, the inlet concentrations were >20% for two measurements but all outlet concentrations were less than the DL, except for the last outlet concentration at 10.4% of the OEL. This single measurement may indicate the beginning of breakthrough for 2,3-dihydrofuran on the SCOTT 7422-SC1 cartridge. However, this may also be a result of sampling error given that the flowrate through the sample tube for this data point was flagged as suspect.

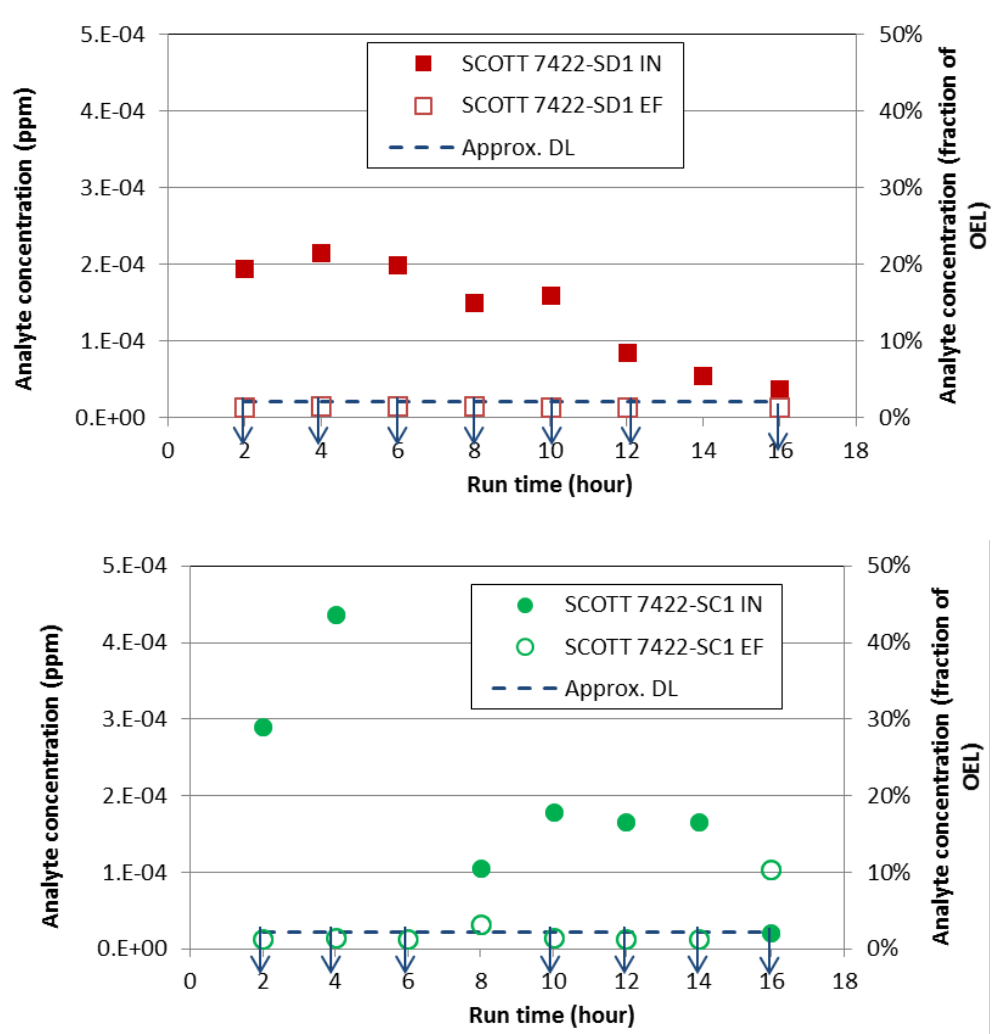


Figure 5. Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Acetonitrile (see Figure 6) – The DL for acetonitrile corresponds to ~0.002% of the OEL. The inlet concentrations for SCOTT 7422-SD1 were higher than DL, but <0.5% of the OEL. The inlet concentrations for SCOTT 7422-SC1 were higher than the concentrations measured for SCOTT-7422-SD1, except for one measurement (at 8 hours) on the SCOTT 7422-SC1 cartridge which was 21% of the OEL. All outlet measurements for the two cartridges were <1% of the OEL, except for one measurement (at 8 hours) on the SCOTT 7422-SC1 cartridge which was 21% of the OEL. Analytical error or flow rate measurement error is suspected in this data point since it is greatly different from the surrounding values. Despite the other outlet measurements being greater than the DL, the data does not support evidence of breakthrough over the measured time period for either cartridge tested.

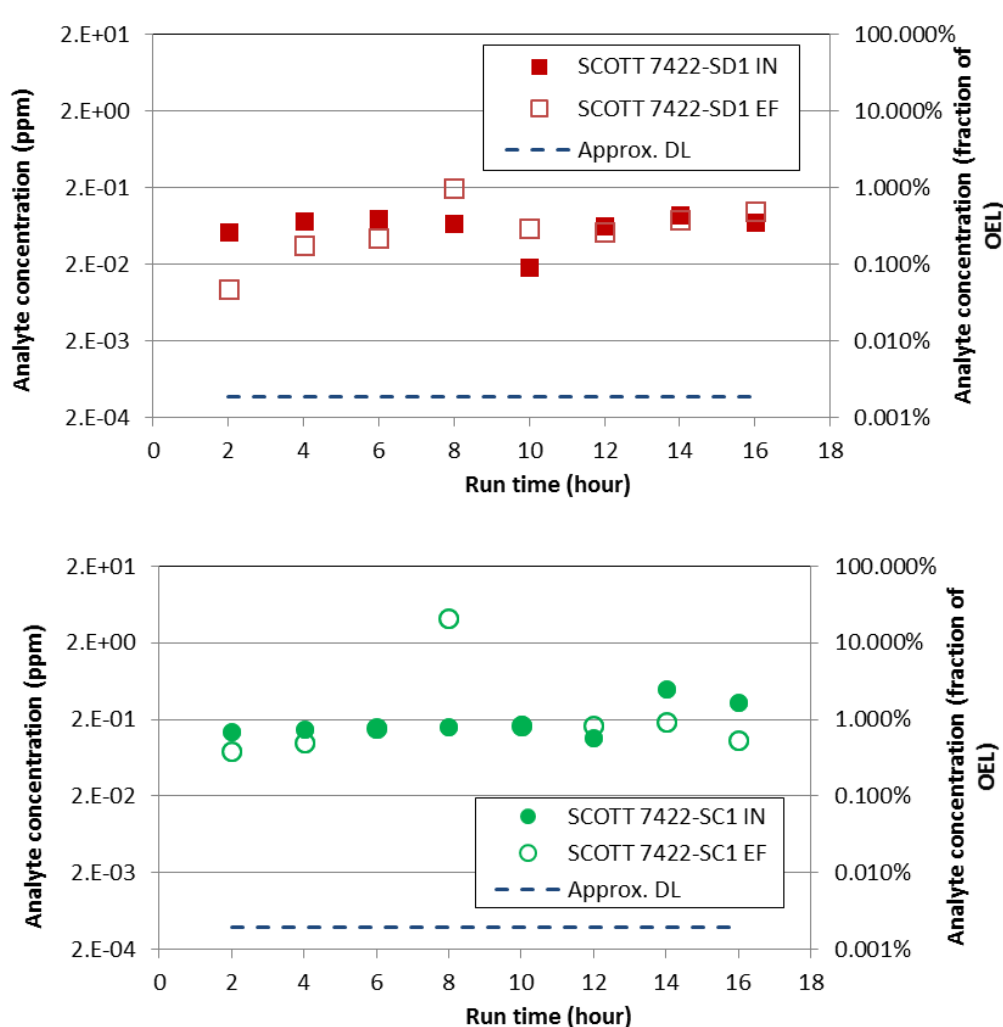


Figure 6. Plot of Measured Acetonitrile Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

N-Nitrosodimethylamine (see Figure 7) – The DL for NDMA corresponds to ~11% of the OEL. Inlet measurements for both cartridge tests were significantly greater than the DL, ranging between 420% and 932% of the OEL. The outlet measurements for both respirator cartridges were below the analytical DL except for the last outlet concentration for cartridge SCOTT 7422-SC1 at 644% of the OEL, indicating potential breakthrough of NDMA at the end of the testing period. Note that for this higher outlet concentration, the corresponding inlet was the lowest of any inlet measurement for NDMA. This could indicate a sampling or analysis error due to swapped inlet and outlet sorbent tube samples for the 16-hour data set, although this could not be confirmed. Thus, there was no evidence of breakthrough for the SCOTT 7422-SD1 cartridge. The possible breakthrough for the SCOTT 7422-SC1 cartridge is based on a highly-suspect data point.

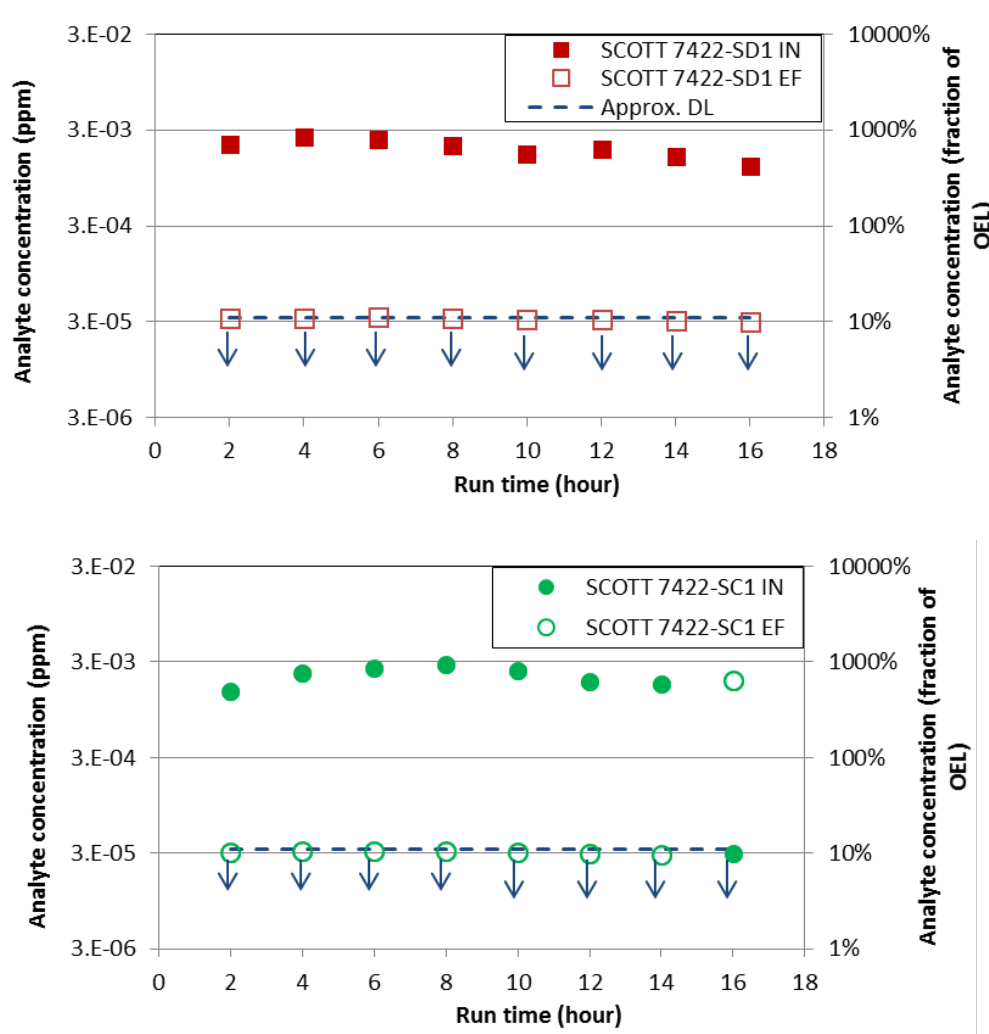


Figure 7. Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosodiethylamine (see Figure 8) – The DL for NDEA corresponds to ~23% of the OEL. All inlet and outlet measurements for both respirator cartridges were less than the analytical DL. Despite the DL being >10% of the OEL, the outlet measurements do not indicate breakthrough over the measured time period for either cartridge tested.

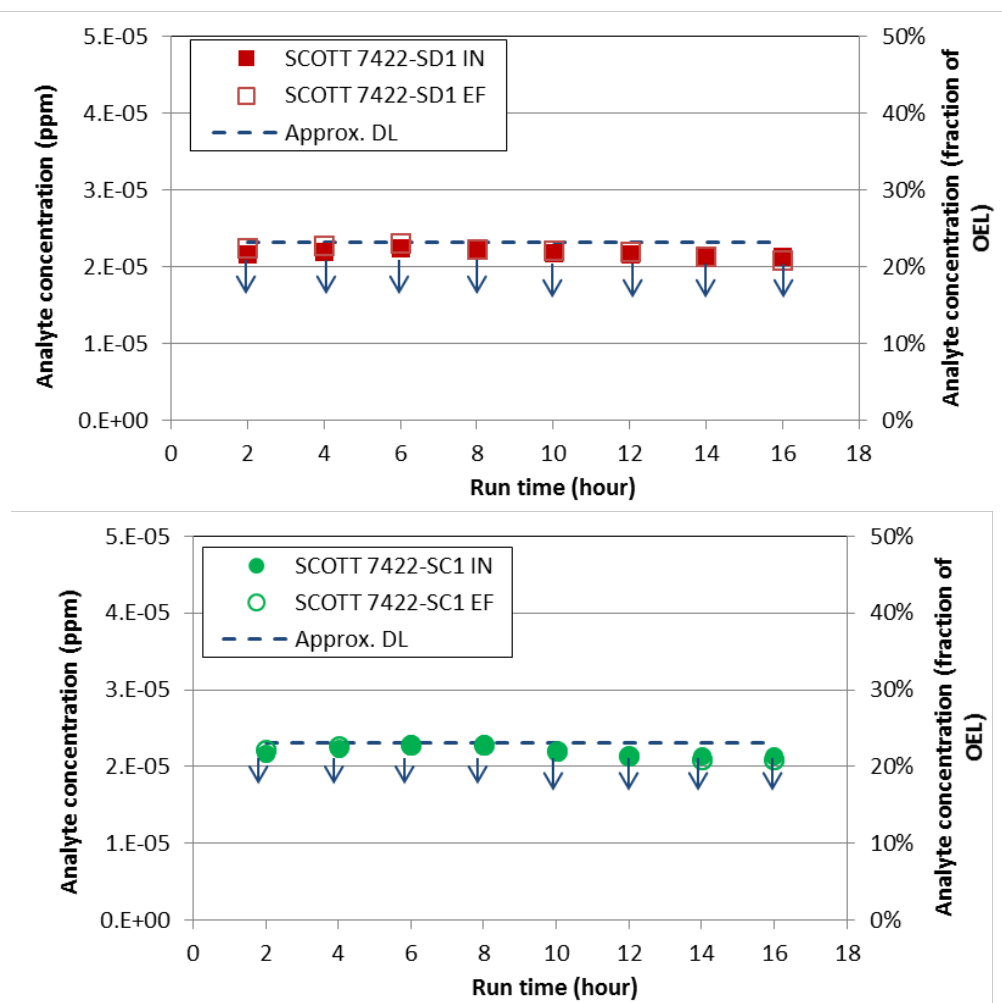


Figure 8. Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

N-Nitrosomethylethylamine (see Figure 9) – The DL for NMEA corresponds to ~9% of the OEL. The inlet concentrations measured throughout the testing period for both cartridges were higher than the DL (as high as 15.5% of the OEL) earlier in the testing for both cartridges but decreased to the DL by the end of testing. All outlet measurements for both respirator cartridges were less than the analytical DL, except for the last outlet concentration for cartridge SCOTT 7422-SC1 at 8% of the OEL. This measurement is from the same suspect sample noted for NDMA above and could indicate a sampling or analysis error due to swapped inlet and outlet sorbent tube samples for the 16-hour data set. Regardless, all outlet concentrations were <10% of the OEL, thus there is no indication of breakthrough over the measured time period for either cartridge tested.

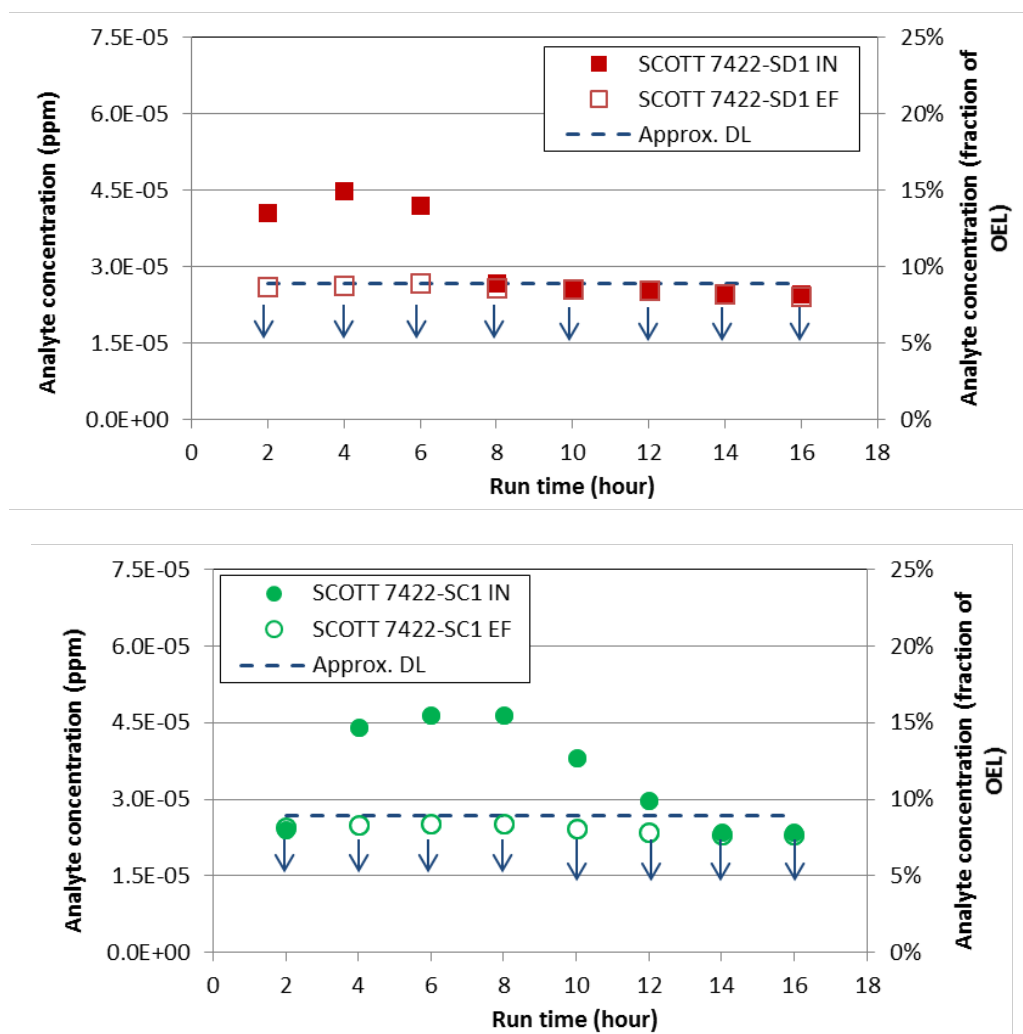


Figure 9. Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

N-Nitrosomorpholine (see Figure 10) – The DL for N-nitrosomorpholine corresponds to ~3.4% of the OEL. The inlet concentrations measured throughout the testing period for both cartridges were higher than the DL (as high as 14.4% of the OEL) early in the testing but decreased to the DL by the end of testing. All outlet measurements for both respirator cartridges were less than the DL, except for the last outlet concentration for the SCOTT 7422-SC1 cartridge, which was 7.9% of the OEL. This could indicate the beginning of cartridge breakthrough at the end of the testing period; however, this measurement is consistent with the NDMA result for the same sample period, where the inlet and outlet values were suspected to have been swapped. Based on the information above, there is no indication of breakthrough for the SCOTT 7422-SD1 cartridge over the measured time period, and no indication of breakthrough for the SCOTT 7422-SC1 cartridge over 10% of the OEL. Further, the early indication of breakthrough for the SCOTT 7422-SC1 cartridge could have been due to a sample error.

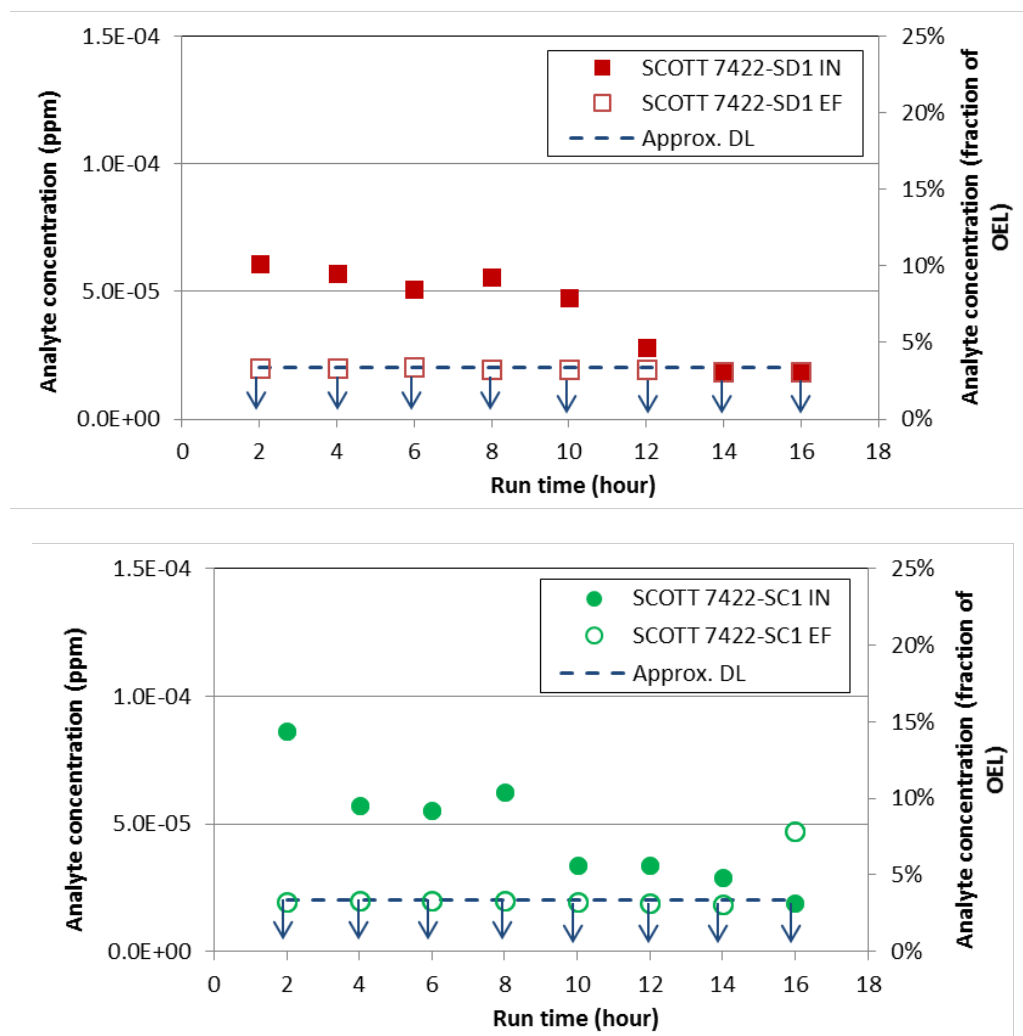


Figure 10. Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet points not visible are obscured by the inlet 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 AX-101 headspace 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, five COPCs—ammonia, mercury, formaldehyde, 2-pentylfuran, and NDMA—have been previously measured in the AX-101 headspace at concentrations above 10% of their respective OELs and above analytical RLs. Of these five COPCs:

- Mercury maximum and average inlet concentrations measured in this cartridge study were generally consistent¹⁴ with historic headspace measurements.
- Ammonia and NDMA maximum inlet concentrations measured in this cartridge study were ~110% and 75% higher, respectively than the historic maximum headspace measurements. Average cartridge inlet concentrations were even higher (i.e., 466% higher for ammonia and 240% higher for NDMA) than historic headspace average measurements.
- Most of the historic headspace data for furan¹⁵ and substituted furans reported measured concentrations less than RLs. Only 2-pentylfuran reported higher concentrations from pre-2006 TWINS headspace data, with average and maximum results of 160% and 274% of the OEL, respectively. In contrast, the average and maximum inlet concentrations from cartridge testing measured ~4.4 and 6.3% of the OEL, respectively, which are substantially lower than older historic data, but generally consistent with the more recent results that are less than the RL.
- Formaldehyde concentrations have been measured in previous headspace samples at an average of 12% of the OEL. The average inlet concentration observed in this cartridge study was ~60% lower at 4.9% of the OEL. The maximum inlet concentration of 14.4% of the OEL was comparable to the historic headspace average.

In addition to the five COPCs listed above with historic concentrations exceeding 10% of their OELs, four additional COPCs were detected in this study at inlet concentrations exceeding 10% of their OELs. Furan, 2,3-dihydrofuran, NMEA, and N-nitrosomorpholine maximum inlet concentrations in the current study exceeded the historic headspace measurements, which were all less than their RLs.

¹⁴ Inlet concentrations were considered generally consistent if they were within a factor of 2 (–50% to +100%) of historic maximum or average headspace measurements.

¹⁵ Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 cartridge and below the DL (17.4% of the OEL) for the 7422-SC1 cartridge. Inlet and effluent concentration measurements for 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU Method were all below DLs. Breakthrough was not observed on either cartridge.

Table 2. Historical AX-101 Headspace Data for COPCs with Boiling Points <70°C (158°F)

COPC Number and Name	CAS Number	Boiling Point (°F)	Occupational Exposure Limit (OEL)	Historical Measurements ¹					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	1	<RL	<RL	<RL	<RL	Not Measured	
1 Ammonia	7664-41-7	-28	25 ppm	3	93.9	31.6*	376%	126%*	801%	767%
50 2-Fluoropropene	1184-60-7	-11	0.1 ppm	1	<RL	<RL	<RL	<RL	Not Detected - TIC	
14 Formaldehyde	50-00-0	-6	0.3 ppm	5	<RL	0.0353*	<RL	12%*	14.4%	0.67%
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	5	<RL	<RL	<RL	<RL	2.0% (RL) ²	2.1% (RL)
42 Ethylamine	75-04-7	62	5 ppm	2	<RL	<RL	<RL	<RL	0.097% (RL)	0.098% (RL)
15 Acetaldehyde	75-07-0	69	25 ppm	2	<RL	<RL	<RL	<RL	0.42%	0.32%
19 Furan	110-00-9	88	1 ppb	5	<RL	<RL	<RL	<RL	14.7%	6.2%
59 Methyl Isocyanate	624-83-9	103	0.02 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	
20 2,3-Dihydrofuran	1191-99-7	130	1 ppb	2	<RL	<RL	<RL	<RL	43.6%	10.4%
22 2-Methylfuran	534-22-5	147	1 ppb	4	<RL	<RL	<RL	<RL	3.7% (DL)	2.6% (DL)
8 Methanol	67-56-1	148	200 ppm	0	n/a	n/a	n/a	n/a	Not Measured	
21 2,5-Dihydrofuran	1708-29-8	152	1 ppb	5	<RL	<RL	<RL	<RL	3.1% (DL)	4.0%

¹ 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

² "(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 from September 9–11, 2016, using headspace vapors from Hanford tank AX-101 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. PNNL was tasked to independently analyze the collected data and make recommendations based on the results for respiratory cartridge performance and service life.

The AX-101 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 headspace vapor stream ranged from 54 to 93°F, and the average relative humidity ranged from 42 to 85%. The inlet concentrations measured are shown in Table 1. Thus, any conclusions on respirator cartridge performance pertain to the above-stated conditions.

The key conclusions from the analysis are described below:

- Based on measured cartridge inlet vapor concentrations from tank AX-101, only two COPCs, ammonia and NDMA, exceeded their corresponding OELs.¹⁶ Six COPCs—mercury, formaldehyde, furan, 2,3-dihydrofuran, NMEA, and N-nitrosomorpholine—reported one or more inlet concentration measurements >10% of their corresponding OELs, but <100% of their OELs. Inlet and outlet measurements for all other COPCs did not exceed 10% of their OELs, except for acetonitrile that had a single outlet measurement at 21% of its OEL, and NDEA that had inlet and outlet measurements below the DL of ~23% of the OEL.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 801% of the OEL (200 ppm) during the testing, which was higher than average and maximum historical headspace measurements. For both cartridges tested, ammonia appeared to breakthrough, above 10% of its OEL, after 2 hours.
- Cartridge inlet concentration measurements for NDMA reached 932% of its OEL (2.8 ppb), which was higher than average and maximum historical headspace concentrations. All outlet concentrations were less than the analytical RL of ~11% of the OEL, except for the final measurement at 16 hours on SCOTT 7422-SC1, which indicated a concentration equivalent to the 14-hour inlet concentration. Sampling error likely is the reason for this suspect data point, possibly the result of swapping the inlet and outlet samples. The other nitrosamines indicated a similar sample issue. There is no indication of breakthrough for SCOTT 7422-SD1, and the suspect data point for SCOTT 7422-SC1 provides no compelling indication of breakthrough.

¹⁶ 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.

- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant, up to 24% of the OEL, which is comparable to historic AX-101 measurements. Respirator outlet concentrations for mercury were all below the DL, except for the last outlet concentration for SCOTT 7422-SC1 at 16% of the OEL, indicating potential breakthrough after 14 hours of testing.
- Formaldehyde inlet concentrations reached a maximum early in the test period of ~10% and 14% for SCOTT 7422-SD1 and SCOTT 7422-SC1 cartridges, respectively, and then declined to less than the DL. All outlet measurements were less than or slightly above the DL, indicating no breakthrough during the test period.
- The respirator cartridge inlet concentrations for both furan¹⁷ and 2,3-dihydrofuran varied from a maximum of 15% and 44% of their OELs, respectively, to less than DLs. All historic data for these two furan compounds in AX-101 were less than their RLs. Outlet concentrations for both cartridges were less than DLs except for the 16-hour measurement on the SCOTT 7422-SC1 cartridge for both furan and 2,3-dihydrofuran, which showed detectable concentrations of 6.2% and 10% of the OELs, respectively. These data indicate the potential that breakthrough initiated after 14 hours for the SCOTT 7422-SC1 cartridge; however, this data point was flagged as having a flow issue that could have contributed to data error.
- A single acetonitrile outlet concentration measurement reached ~20.8% of its OEL for the SCOTT 7422-SC1 cartridge test at 8 hours. The high value could either be due to an error in the single concentration measurement or an error in handling the sample. All other inlet and outlet measurements for these COPCs never exceeded 10% of the OEL, specifically <2.6%, indicating no breakthrough.
- Several respirator inlet concentration measurements for NMEA and N-Nitrosomorpholine were slightly above their DLs, but <18% and 14%, respectively. All outlet concentrations were less than the DLs, except for the final measurement at 16 hours on SCOTT 7422-SC1 that showed an elevated outlet concentration more consistent with preceding inlet concentrations at 14 hours. Sampling error is suspected in this case, possibly caused by swapping of the inlet and outlet samples. There is no indication of breakthrough for either cartridge at or above the 10% of OEL limit.

¹⁷ After initial publication of this report (Rev. 0), it was determined that an alternate analytical method using Carbotrap 300 TDUs provided more accurate results. Inlet maximum concentrations for furan using the Carbotrap 300 TDU results were 23.7% of the OEL for the 7422-SD1 and 16.4% of the OEL for the 7422-SC1 cartridge. Still, furan breakthrough was not observed on either cartridge. The re-evaluation of furans using the Carbotrap 300 TDU is discussed in Freeman et. al. [19].

8.0 Recommendations

- Based on the measurements taken for this study, breakthrough occurred early in the A-101 test sequence for ammonia. Ammonia breakthrough above 10% of the OEL occurred after 2 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). However, the inlet ammonia concentrations are close to the upper limits recommended by the Centers for Disease Control and Prevention-National Institute for Occupational Safety and Health recommendations for APR use.¹⁸
- Variations in humidity, temperature, or cartridge inlet concentration for any COPCs, compared to those measured in the current study, could impact breakthrough time, especially if OEL thresholds are exceeded.
- Additional recommendations related to NDMA and NDEA DLs, TICs, further data assessments, and future testing documented in PNNL-25860 for respirator cartridge testing on a slipstream from the Hanford AP tank exhausters also are relevant to the AX-101 headspace. 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.

¹⁸ *CDC-NIOSH Pocket Guide to Chemical Hazards – Ammonia*. Available at <https://www.cdc.gov/niosh/npg/npgd0028.html>.

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Appendix A

Description of Respirator Cartridge Testing Setup

Appendix A

Description of Respirator Cartridge Testing Setup

Washington River Protection Solutions and HiLine Engineering (Richland, Washington) developed the respirator cartridge-testing system as a way to comprehensively test cartridge performance with actual Hanford tank headspace or exhauster slip stream gases. Tank headspace or exhauster slip stream vapors are pulled directly from the source through a flexible hose connecting the tank or exhauster sampling port within the tank farm/exhauster fence line to the respirator cartridge testing system outside the tank farm.[13,14] Multiple inline particulate filters are installed in the line between the tank/exhauster and test system to remove potential radioactive particulates. Each filter unit contains a hydrophobic Fluoropore™ polytetrafluoroethylene filter (Millipore Sigma, Billerica, Massachusetts) that is required pursuant to the radiological work permit. This polytetrafluoroethylene filter medium, which is the same material used for routine tank vapor area monitoring and for sampling and analysis of sources (headspace and exhausters), was selected because of its broad chemical compatibility that minimizes sorption of, or reactions with, chemical compounds. The filter medium is not expected to adversely impact the test objectives because all tank farm vapor sampling uses this type of filter medium.

The test equipment allows for sampling the vapor stream both before and after the cartridge, so that performance for a given Chemical of Potential Concern (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 is 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, COPCs are essentially captured or 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. DryCal flow meters also were used downstream of the sorbent tubes to measure the flow through each sorbent tube. 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 are used 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.

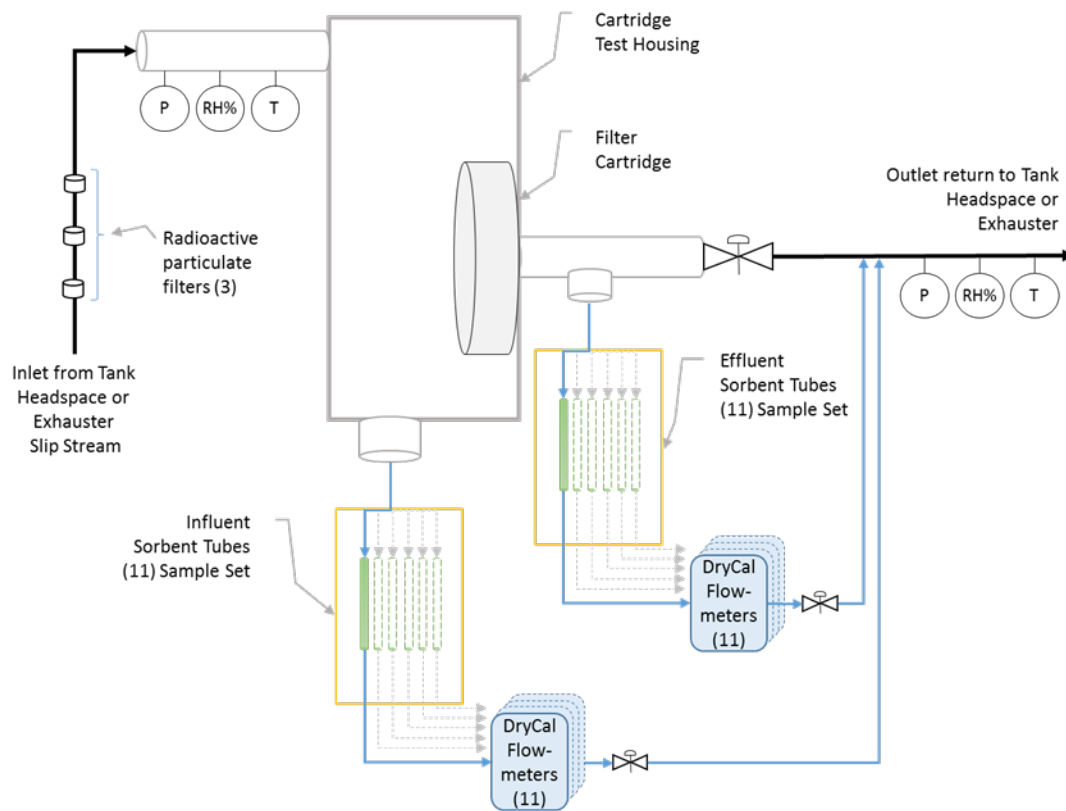


Figure A.1. General Schematic of Respirator Cartridge Test Apparatus

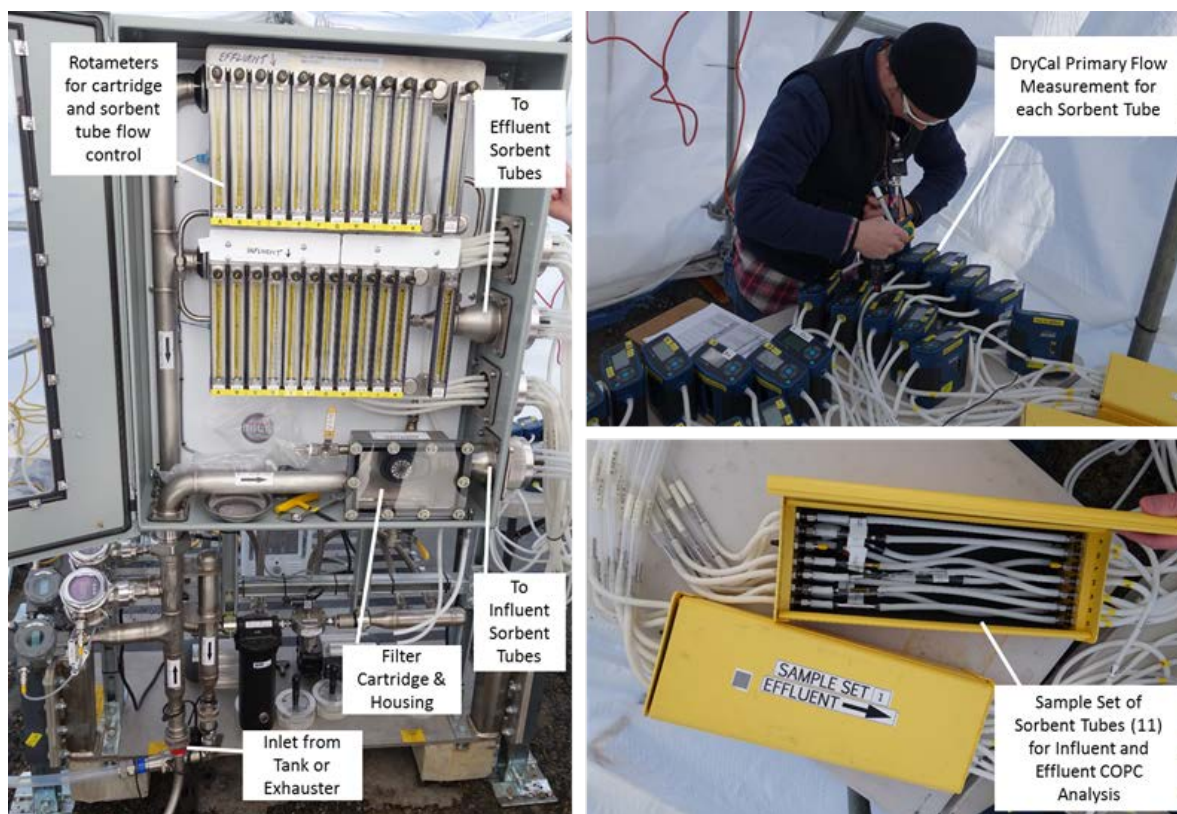


Figure A.2. Photographs of the Respirator Cartridge Test Equipment

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 ^a	Instrument Used ^b	Analysis Location ^c
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-226-01offsite	1000	NIOSH-1613	GC-FID	ALS

Analyte	Media	Flow Rate (mL/min)	Analytical Method^a	Instrument Used^b	Analysis Location^c
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

^a Analytical Method

NIOSH: National Institute of Occupation Safety and Health

EPA: U.S. Environmental Protection Agency

OSHA: Occupational Safety and Health Administration

^b 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

^c 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

C.1 Description

This appendix includes raw data of flow rate, temperature, pressure, and humidity, as well as analytical data for the AX-101 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 measurements 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 limit (DL)/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 a 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 (i.e. fresh air not tank vapor) running through the test system before initiation of tank vapor testing.

'7837' designations correspond to testing with the SCOTT 7422-SD1 respirator cartridge, whereas '8068' designations correspond to testing with the SCOTT 7422-SC1 respirator cartridge.

Position designations 'A1' and 'A2' 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 (1) and outlet (2): B1/B2 (2 to 4 hours), C1/C2 (4 to 6 hours), D1/D2 (6 to 8 hours), E1/E2 (8 to 10 hours), F1/F2 (10 to 12 hours), G1/G2 (12 to 14 hours), and H1/H2 (14 to 16 hours).

The sample IDs embed the information given above. For example, sample ID 16-07837-5-A1 corresponds to the first cartridge survey (16-07837), sample line 5, and the first (0 to 2 hours) influent sample bundle (A1).

The flow rate passing through the respirator cartridge was ~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 'AX Exhauster 9-9 through 9-10 Flow Rates.xlsx' for the first survey with SCOTT 7422-SD1 and 'AX Exhauster 9-10 through 9-11 Flow Rates.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 'AX Exhauster DRI 9-9 through 9-10.xls' and 'AX Exhauster DRI 9-10 through 9-11.xls.' The information is shown in the tables provided in this appendix. Note that the file names for flow rates and temperature and humidity information were mislabeled, referring to an AX "Exhauster" rather than "AX-101" tank headspace. 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 VOCs are from a sampling location between the respirator cartridge and the effluent sorbent tube samples.
- The DRI measurements for ammonia and VOCs 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).
- Prior to testing with the waste tank vapors, a 2 hour "baseline" sample is collected by running ambient outside air through the sampling system before each cartridge is installed for testing. 'BASE' means measurements obtained for ambient air (fresh air not tank vapor) running through the test system before initiation of tank vapor testing.
- 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.
- The raw analytical data for chemicals in each category are summarized together. Examples of chemicals in each category follow:
 - SVOC: Biphenyl, Diethylphthalate, Tributyl phosphate, Dibutyl butylphosphonate, Dodecane, Hexadecane
 - SVOCTIC: Undecane, Cyclotetrasiloxane, octamethyl, Decamethylcyclopentasiloxane, Dodecane, 4,6-dimethyl
 - VOC: 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: 2,6-Dimethyldecane, Decane, 2,3,5,8-tetramethyl-, Decane, 3,7-dimethyl-, Methenamine, Undecane, 2,6-dimethyl-

- Furans: 2,3-Dihydrofuran, 2-Pentylfuran, Furan, Tetrahydrofuran
- 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.

C.2 Experimental Parameters

C.2.1 Flow Rates

SCOTT 7422-SD1 Cartridge (9/9/16 - 9/10/16) AX-101 Headspace

		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	4.04	4.07	3.84	3.82	3.80	3.80	3.75	3.77	3.64	3.71	3.72	3.67	3.71	3.87	3.91	3.88	4.14	3.90
VOC	B	4.20	3.89	3.87	3.64	4.00	3.58	3.62	3.68	3.65	3.94	3.73	3.94	3.73	4.01	3.88	3.93	3.93	
Furans	C	4.14	6.08	3.78	5.83	3.73	5.54	3.68	5.38	3.70	5.47	3.72	5.91	3.87	5.83	3.81	5.93	3.89	5.91
Ethylamine	D	12.1	12.4	12.2	11.7	11.8	11.4	11.6	11.1	11.4	11.8	11.9	12.0	11.8	11.4	11.7	12.3	12.0	12.3
Acetonitrile	E	12.2	13.0	12.2	12.2	11.3	11.5	11.0	11.2	11.1	11.3	11.6	11.6	11.4	11.6	12.0	12.0	12.0	12.0
Mercury	F	29.4	29.4	30.0	28.6	28.0	29.1	27.5	28.8	28.8	28.9	28.8	28.7	29.1	29.5	29.4	29.1	29.8	29.4
Ammonia	G	24.2	24.8	24.0	23.6	23.5	23.3	23.3	22.9	22.9	22.6	23.6	23.0	23.4	23.2	23.7	23.4	23.9	23.4
Aldehyde	H	23.9	24.1	23.8	23.3	23.6	23.1	23.2	22.6	23.0	22.2	23.2	22.7	23.2	22.9	23.6	23.1	23.6	23.4
1,3-Butadiene	I	24.3	23.9	23.4	23.5	23.2	22.0	22.9	22.5	22.8	22.3	22.9	22.8	23.4	23.6	23.5	23.1	23.5	23.3
Pyridine	J	126	125	118	113	114	112	109	110	113	111	115	111	111	116	120	113	125	116
Nitrosamines	K	248	242	232	224	229	221	224	217	226	225	229	228	232	228	233	236	236	241

		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	33.6	33.9	33.6	33.7	33.6	33.9	33.2	33.6	31.9	32.8	32.3	32.1	31.9	33.6	33.4	33.4	35.1	33.3
VOC	B	35.0	32.4	33.8	32.0	35.2	31.8	30.7	32.2	32.0	32.0	34.0	32.5	33.7	32.2	34.1	33.2	33.1	33.4
Furans	C	34.5	50.6	32.6	50.6	32.4	48.6	32.0	47.2	31.9	47.4	31.7	50.8	32.7	49.7	32.0	50.2	32.4	49.6
Ethylamine	D	101	103	105	101	102	100	101	96.7	98.0	102	101	103	99.4	96.8	97.5	104	99.1	103
Acetonitrile	E	102	108	105	106	98.4	101	95.7	98.1	95.0	98.1	98.6	100	96.3	98.4	101	101	100	101
Mercury	F	245	245	260	250	246	257	241	254	249	252	248	248	248	254	249	248	250	249
Ammonia	G	202	207	206	204	204	204	202	201	196	196	201	198	198	197	198	198	199	196
Aldehyde	H	199	201	207	205	208	205	204	200	200	195	201	197	199	197	200	198	199	199
1,3-Butadiene	I	202	199	203	206	203	195	200	198	197	195	196	197	199	202	198	196	197	197
Pyridine	J	1050	1045	1055	1020	1025	1015	980	1000	1005	995	1020	990	975	1025	1045	995	1080	1010
Nitrosamines	K	2070	2020	2035	1980	2030	1975	1985	1940	1985	1990	1995	1995	1995	1985	1995	2035	2000	2060

SCOTT 7422-SC1 Cartridge (9/10/16 - 9/11/16) AX-101 Headspace

Volumes Air Collected (L)

Sample Box Number		Mach.	Mach.																
Analyte	Line	Base 1	Base 2	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
SVOC	A	3.94	3.80	0.00	3.69	3.68	3.71	3.52	3.55	3.32	3.59	3.57	3.65	3.69	3.70	3.77	3.69	3.73	3.68
VOC	B	3.61	4.15	3.85	3.92	3.80	3.34	3.86	3.48	3.58	3.30	3.50	3.55	3.75	3.93	3.74	3.83	3.67	4.74
Furans	C	3.89	6.45	3.84	6.15	3.92	5.68	3.93	5.92	3.94	5.93	3.70	5.49	3.79	5.83	3.77	5.80	3.76	6.37
Ethylamine	D	12.9	12.9	12.5	11.9	11.2	11.0	11.2	11.0	11.2	11.0	11.2	11.1	11.4	11.3	11.4	11.3	11.5	11.3
Acetonitrile	E	12.6	13.4	12.6	11.9	11.1	11.7	11.2	11.7	11.4	11.6	11.3	11.3	11.4	11.4	11.4	11.3	11.4	11.2
Mercury	F	29.9	31.7	29.2	28.4	29.0	27.8	28.3	27.6	27.8	27.3	28.1	27.8	28.3	28.2	28.8	28.9	29.2	28.3
Ammonia	G	25.0	25.0	22.8	22.9	22.7	23.1	22.6	22.7	22.6	22.6	22.5	22.4	23.1	22.8	23.3	22.8	23.5	23.1
Aldehyde	H	24.7	25.4	23.2	23.1	22.8	23.2	22.6	21.8	22.2	21.6	22.1	21.9	22.8	22.5	23.0	22.6	22.7	22.8
1,3-Butadiene	I	24.4	25.0	23.3	23.1	23.4	22.7	23.1	22.5	22.6	22.2	22.4	22.4	22.8	22.4	23.4	22.7	22.9	23.0
Pyridine	J	130	127	120	117	113	114	112	114	112	113	114	113	113	113	114	115	114	118
Nitrosamines	K	230	243	220	215	214	211	209	209	209	210	219	217	224	224	224	228	224	228

Flow Rates (ml/min)

Sample Box Number		Mach.	Mach.																
Analyte	Line	Base 1	Base 2	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
SVOC	A	32.9	31.6		33.0	33.3	33.8	32.3	32.8	30.4	33.1	32.0	33.0	32.5	32.9	33.1	32.6	32.6	32.5
VOC	B	30.1	34.6	34.0	34.9	34.3	30.3	35.2	32.0	32.7	30.3	31.2	32.0	33.0	34.8	32.7	33.7	32.0	41.6
Furans	C	32.4	53.8	33.5	54.1	34.9	51.0	35.4	53.7	35.5	53.9	32.6	48.8	32.9	51.0	32.5	50.4	32.3	55.3
Ethylamine	D	107	108	108	104	99.4	98.5	100	100	100	100	98.4	98.0	98.6	98.5	98.1	97.9	98.5	97.7
Acetonitrile	E	105	112	110	105	99.0	105	101	106	102	105	100	100	98.8	99.8	97.8	97.8	98.1	96.8
Mercury	F	249	265	257	252	260	251	257	252	252	250	249	249	247	249	250	253	253	247
Ammonia	G	208	208	199	201	202	207	203	206	203	204	198	199	200	199	201	198	202	200
Aldehyde	H	206	211	205	206	206	211	206	201	202	198	197	197	200	199	200	199	198	201
1, 3-Butadiene	I	204	208	205	204	209	205	209	205	205	203	198	200	199	197	203	198	198	201
Pyridine	J	1080	1055	1085	1065	1040	1065	1045	1075	1045	1065	1040	1040	1015	1025	1020	1035	1015	1065
Nitrosamines	K	1915	2025	1955	1930	1945	1935	1915	1935	1915	1940	1965	1965	1985	1995	1970	2025	1960	2015

C.2.2 Temperature, Pressure, and Relative Humidity

SCOTT 7422-SD1 Cartridge (9/9/16 - 9/10/16) AX-101 Headspace

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	42.7	83.8	66.7	59.3	65.6	77.5	74.1	72.2	84.5
Temperature	F	72.9	73.6	79	81.6	77.4	69.4	65.6	61.8	57.1
Pressure	Torr	745	739	738	737	736	737	736	735	736
NH3	ppm									
VOC	ppm									

Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	42.2	63.8	57.9	64.3	77.51	77.8	77.2	84.9	85.2
Temperature	F	73.3	79.2	82.7	78.0	69.7	69.1	61.8	57.9	54.4
Pressure	Torr	744	738	737	736	736	736	735	735	735
NH3	ppm		99+	0						
VOC	ppm		10	0						

Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	23.4	24.1	31.9	27.5	29.7	33.5	33.8	37.5	41.9
Temperature	F	73.6	73.1	80.5	84.1	79.0	70.0	66.2	63.2	57.6
Pressure	Torr	451	435	446	456	457	436	443	453	447
NH3	ppm									
VOC	ppm									

Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	22.4	29.9	27.8	29.8	34.3	30.7	37.5	43.1	45.8
Temperature	F	76.2	82.7	85.3	80.6	71.5	69.7	63.2	58.4	54.9
Pressure	Torr	455	458	462	461	460	459	453	451	447
NH3	ppm		6	83+						
VOC	ppm		1.35	4.95						

SCOTT 7422-SC1 Cartridge (9/10/16 - 9/11/16) AX-101 Headspace

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	75.9	82.2	59.0	51.5	42.2	51.8	67.2	74.2	78.2
Temperature	F	59.5	71.5	85.6	91.0	93.3	85.8	74.8	70.5	69.0
Pressure	Torr	739	732	731	729	727	727	729	730	729
NH3	ppm									
VOC	ppm									
Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	66.8	60.3	47.9	45.0	47.4	67.2	79.4	78.2	81.3
Temperature	F	69.4	84.7	90.6	93.4	89.6	75.2	70.9	69.0	67.9
Pressure	Torr	741	731	730	727	727	728	729	729	729
NH3	ppm		99+	99+	99+					
VOC	ppm		3.3	11.1	10+					
Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	35.7	29.6	29.9	25.4	20.3	30.7	29.8	38.0	37.0
Temperature	F	59.5	71.2	87.6	92.8	98.2	78.4	77.0	71.4	69.8
Pressure	Torr	430	440	445	453	460	457	449	445	441
NH3	ppm									
VOC	ppm									
Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	28.2	30.1	24.3	20.4	21.6	30.7	36.9	37.0	40.0
Temperature	F	69.6	87.6	84.1	100.0	95.4	78.4	72.0	69.8	69.2
Pressure	Torr	452	458	461	463	462	457	454	441	451
NH3	ppm		3.0	99+	99+					
VOC	ppm		3.6	4.3	10+					

C.3 Raw Analytical Data

C.3.1 SVOC and SVOCTIC

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Cartridge Evaluation Data Summary Report

John Dugan
10/20/16

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BASE-EFF
Customer Sample ID: 16-07837-1-BASE-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029731			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	n/a U
S16T029731			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a U
S16T029731			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029731			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a U
S16T029731			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a U
S16T029731			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a U
S16T029731			112-40-3	Dodecane	NGS	98	<0.60	37	n/a	n/a	n/a	n/a	0.55	n/a	n/a
S16T029731			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T029731			629-59-4	Tetradecane	NGS	110	<3.9	5.1	n/a	n/a	n/a	n/a	3.9	n/a	n/a J
S16T029731			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029731			629-50-5	Tridecane	NGS	96	<1.6	19	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029731			629-76-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T029731			629-62-9	Pentadecane	NGS	120	<3.0	5.1	n/a	n/a	n/a	n/a	3.0	n/a	n/a J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BASE-IN

Customer Sample ID: 16-07837-1-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029732			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
S16T029732			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029732			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029732			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029732			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029732			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029732			112-40-3	Dodecane	NGS	98	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029732			544-76-3	Hexadecane-	NGS	130	<3.3	3.5	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T029732			629-59-4	Tetradecane	NGS	110	<3.9	4.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029732			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029732			629-50-5	Tridecane	NGS	96	<1.6	7.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029732			629-78-7	Heptadecane	NGS	100	<2.4	3.0	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029732			629-62-9	Pentadecane	NGS	120	<3.0	7.8	n/a	n/a	n/a	n/a	3.0	n/a	J

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

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BLANK1

Customer Sample ID: 16-07837-1-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029733			3891-98-3	2,6,10-Trimethylidodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029733			85-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029733			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029733			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029733			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029733			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029733			112-40-3	Dodecane	NGS	98	<0.60	1.4	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029733			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029733			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029733			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029733			629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029733			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029733			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
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N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BLANK2

Customer Sample ID: 16-07837-1-BLANK2

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cat Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029734			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	n/a
S16T029734			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a
S16T029734			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a
S16T029734			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a
S16T029734			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a
S16T029734			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a
S16T029734			112-40-3	Dodecane	NGS	98	<0.60	1.2	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029734			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a
S16T029734			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a
S16T029734			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a
S16T029734			629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029734			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a
S16T029734			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	n/a

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-A

Customer Sample ID: 16-07837-1-EFF-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029735			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
S16T029735			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029735			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029735			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029735			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029735			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029735			112-40-3	Dodecane	NGS	98	<0.60	44	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029735			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029735			629-59-4	Tetradecane	NGS	110	<3.9	5.0	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029735			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029735			629-50-5	Tridecane	NGS	96	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029735			629-78-7	Heptadecane	NGS	100	<2.4	2.7	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029735			629-62-9	Pentadecane	NGS	120	<3.0	5.4	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747
SDG Number:
Customer Sample ID: 16-07837-1-EFF-B
Customer Sample ID: 16-07837-1-EFF-B

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029736			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
S16T029736			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029736			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029736			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029736			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029736			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029736			112-40-3	Dodecane	NGS	98	<0.60	52	n/a	n/a	n/a	n/a	0.55	n/a	E
S16T029736			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029736			629-59-4	Tetradecane	NGS	110	<3.9	5.5	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029736			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029736			629-50-5	Tridecane	NGS	96	<1.6	20	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029736			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029736			629-62-9	Pentadecane	NGS	120	<3.0	5.2	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-C

Customer Sample ID: 16-07837-1-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029737			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029737			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029737			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029737			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029737			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029737			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029737			112-40-3	Dodecane	NGS	98	<0.60	42	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029737			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029737			629-59-4	Tetradecane	NGS	110	<3.9	4.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029737			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029737			629-50-5	Tridecane	NGS	96	<1.6	19	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029737			629-78-7	Heptadecane	NGS	100	<2.4	3.1	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029737			629-62-9	Pentadecane	NGS	120	<3.0	7.3	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-D

Customer Sample ID: 16-07837-1-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029738			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029738			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029738			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029738			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029738			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029738			84-86-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029738			112-40-3	Dodecane	NGS	98	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029738			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029738			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029738			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029738			629-50-5	Tridecane	NGS	96	<1.6	6.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029738			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029738			629-62-9	Pentadecane	NGS	120	<3.0	4.4	n/a	n/a	n/a	n/a	3.0	n/a	J

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-E

Customer Sample ID: 16-07837-1-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029739			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
S16T029739			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029739			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029739			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029739			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029739			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029739			112-40-3	Dodecane	NGS	98	<0.60	17	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029739			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029739			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029739			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029739			629-50-5	Tridecane	NGS	96	<1.6	6.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029739			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029739			629-62-9	Pentadecane	NGS	120	<3.0	4.4	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-F

Customer Sample ID: 16-07837-1-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029740			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029740			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029740			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029740			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029740			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029740			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029740			112-40-3	Dodecane	NGS	98	<0.60	23	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029740			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029740			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029740			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029740			629-50-5	Tridecane	NGS	96	<1.6	6.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029740			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029740			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
E - Outside Calibration Range

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-G

Customer Sample ID: 16-07837-1-EFF-G

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029741			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029741			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029741			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029741			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029741			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029741			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029741			112-40-3	Dodecane	NGS	98	<0.60	33	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029741			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029741			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029741			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029741			629-50-5	Tridecane	NGS	96	<1.6	3.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029741			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029741			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
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-H

Customer Sample ID: 16-07837-1-EFF-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029742			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029742			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029742			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029742			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029742			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029742			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029742			112-40-3	Dodecane	NGS	98	<0.60	17	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029742			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029742			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029742			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029742			629-50-5	Tridecane	NGS	96	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029742			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029742			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
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-A

Customer Sample ID: 16-07837-1-IN-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029743			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
S16T029743			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T029743			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T029743			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T029743			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T029743			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T029743			112-40-3	Dodecane	NGS	98	<0.60	42	n/a	n/a	n/a	n/a	0.55		n/a
S16T029743			544-76-3	Hexadecane-	NGS	130	<3.3	4.1	n/a	n/a	n/a	n/a	3.3		n/a J
S16T029743			629-59-4	Tetradecane	NGS	110	<3.9	6.2	n/a	n/a	n/a	n/a	3.9		n/a J
S16T029743			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T029743			629-50-5	Tridecane	NGS	96	<1.6	19	n/a	n/a	n/a	n/a	1.6		n/a
S16T029743			629-78-7	Heptadecane	NGS	100	<2.4	5.1	n/a	n/a	n/a	n/a	2.4		n/a J
S16T029743			629-62-9	Pentadecane	NGS	120	<3.0	6.7	n/a	n/a	n/a	n/a	3.0		n/a J

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-B

Customer Sample ID: 16-07837-1-IN-B

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029744			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029744			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029744			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029744			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029744			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029744			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029744			112-40-3	Dodecane	NGS	98	<0.60	72	n/a	n/a	n/a	n/a	0.55	n/a	E
S16T029744			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029744			629-59-4	Tetradecane	NGS	110	<3.9	9.3	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029744			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029744			629-50-5	Tridecane	NGS	96	<1.6	23	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029744			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029744			629-62-9	Pentadecane	NGS	120	<3.0	6.5	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-C

Customer Sample ID: 16-07837-1-IN-C

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029745			3891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	5.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029745			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029745			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029745			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029745			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029745			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029745			112-40-3	Dodecane	NGS	98	<0.60	41	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029745			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029745			629-59-4	Tetradecane	NGS	110	<3.9	11	n/a	n/a	n/a	n/a	3.9	n/a	
S16T029745			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029745			629-50-5	Tridecane	NGS	96	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029745			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029745			629-62-9	Pentadecane	NGS	120	<3.0	6.0	n/a	n/a	n/a	n/a	3.0	n/a	J

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-D

Customer Sample ID: 16-07837-1-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029746			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
S16T029746			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029746			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029746			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029746			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029746			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029746			112-40-3	Dodecane	NGS	98	<0.60	32	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029746			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029746			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029746			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029746			629-50-5	Tridecane	NGS	96	<1.6	7.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029746			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029746			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
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-E

Customer Sample ID: 16-07837-1-IN-E

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029747			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
S16T029747			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029747			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029747			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029747			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029747			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029747			112-40-3	Dodecane	NGS	98	<0.60	9.6	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029747			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029747			629-59-4	Tetradecane	NGS	110	<3.9	7.2	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029747			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029747			629-50-5	Tridecane	NGS	96	<1.6	4.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029747			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029747			629-62-9	Pentadecane	NGS	120	<3.0	4.2	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-F

Customer Sample ID: 16-07837-1-IN-F

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029748			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
S16T029748			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029748			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029748			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029748			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029748			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029748			112-40-3	Dodecane	NGS	98	<0.60	20	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029748			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029748			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029748			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029748			629-50-5	Tridecane	NGS	96	<1.6	3.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029748			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029748			629-62-9	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
E - Outside Calibration Range

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-G

Customer Sample ID: 16-07837-1-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029749			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
S16T029749			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029749			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029749			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029749			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029749			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029749			112-40-3	Dodecane	NGS	98	<0.60	9.8	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029749			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029749			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029749			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029749			629-50-5	Tridecane	NGS	96	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029749			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029749			629-62-9	Pentadecane	NGS	120	<3.0	3.2	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-H

Customer Sample ID: 16-07837-1-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029750			3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029750			95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029750			108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029750			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029750			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029750			84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029750			112-40-3	Dodecane	NGS	98	<0.60	15	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029750			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029750			629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029750			126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029750			629-50-5	Tridecane	NGS	96	<1.6	7.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029750			629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029750			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
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

John Dug
10/20/14

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BASE-EFF

Customer Sample ID: 16-07837-1-BASE-EFF

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029731				Hydroxylamine, O-decyl-	29812-79-1	3.66	NGS	39 JNT	
S16T029731				Cyclotetrasiloxane, octamethyl	556-67-2	4.38	NGS	280 JNT	
S16T029731				Cyclohexene, 1-methyl-5-(1-met	1461-27-4	4.86	NGS	78 JNT	
S16T029731				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	22 JNT	
S16T029731				Acetophenone	98-86-2	5.18	NGS	12 JNT	
S16T029731				Undecane	1120-21-4	5.45	NGS	61 JNT	
S16T029731				Heptane, 2,4,6-trimethyl-	2613-61-8	5.50	NGS	34 JNT	
S16T029731				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	88 JNT	
S16T029731				Benzothiazole	95-16-9	6.60	NGS	46 JNT	
S16T029731				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.18	NGS	28 JNT	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BASE-IN

Customer Sample ID: 16-07837-1-BASE-IN

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029732				Hexanal	86-25-1	2.80	NGS	26	JNT
S16T029732				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	76	JNT
S16T029732				Hexanal, 5-methyl-	1860-39-5	3.67	NGS	51	JNT
S16T029732				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	270	JNT
S16T029732				D-Limonene	5989-27-5	4.86	NGS	72	JNT
S16T029732				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	23	JNT
S16T029732				Acetophenone	98-86-2	5.18	NGS	15	JNT
S16T029732				Undecane	1120-21-4	5.45	NGS	47	JNT
S16T029732				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	89	JNT
S16T029732				Benzothiazole	95-16-9	6.59	NGS	31	JNT
S16T029732				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	17	JNT
S16T029732				Undecane, 2-methyl-	7045-71-8	7.26	NGS	15	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-BLANK2

Customer Sample ID: 16-07837-1-BLANK2

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029734				Cyclotrisiloxane, hexamethyl-	541-05-9	2.85	NGS	32	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-A

Customer Sample ID: 16-07837-1-EFF-A

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029735				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	93	JNT
S16T029735				2,4,6-Tetramethyl-1-undecene	59920-26-2	3.66	NGS	48	JNT
S16T029735				Benzaldehyde	100-52-7	4.25	NGS	28	JNT
S16T029735				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	220	JNT
S16T029735				Phenol	108-95-2	4.41	NGS	65	JNT
S16T029735				D-Limonene	5989-27-5	4.86	NGS	110	JNT
S16T029735				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	34	JNT
S16T029735				Acetophenone	98-86-2	5.19	NGS	31	JNT
S16T029735				Octane, 2,3,6,7-tetramethyl-	52670-34-5	5.39	NGS	28	JNT
S16T029735				Undecane	1120-21-4	5.45	NGS	81	JNT
S16T029735				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	75	JNT
S16T029735				Benzothiazole	95-16-9	6.61	NGS	45	JNT
S16T029735				Dodecane, 2,7,10-trimethyl-	74645-98-0	6.90	NGS	31	JNT
S16T029735				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	8.6	JNT
S16T029735				Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	27	JNT
S16T029735				Undecane, 3,7-dimethyl-	17301-29-0	7.26	NGS	28	JNT
S16T029735				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.19	NGS	59	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-B

Customer Sample ID: 16-07837-1-EFF-B

Sample#	R	AF	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029736				Hexanal	66-25-1	2.80	NGS	26 JNT	
S16T029736				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	71 JNT	
S16T029736				Propane, 2-methyl-1-nitro-	625-74-1	3.23	NGS	91 JNT	
S16T029736				Propanoic acid, 2,2-dimethyl-	75-98-9	3.23	NGS	92 JNT	
S16T029736				Hexanal, 5-methyl-	1860-39-5	3.67	NGS	93 JNT	
S16T029736				Benzaldehyde	100-52-7	4.25	NGS	32 JNT	
S16T029736				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	360 JNT	
S16T029736				Phenol	108-95-2	4.41	NGS	46 JNT	
S16T029736				D-Limonene	5989-27-5	4.86	NGS	150 JNT	
S16T029736				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	44 JNT	
S16T029736				Acetophenone	98-86-2	5.19	NGS	48 JNT	
S16T029736				2,3-Dimethyldecane	17312-44-6	5.39	NGS	33 JNT	
S16T029736				Undecane	1120-21-4	5.45	NGS	140 JNT	
S16T029736				Ethanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	25 JNT	
S16T029736				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	100 JNT	
S16T029736				Benzothiazole	95-16-9	6.61	NGS	68 JNT	
S16T029736				Dodecane,4,6-dimethyl	61141-72-8	6.90	NGS	42 JNT	
S16T029736				Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	31 JNT	
S16T029736				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.26	NGS	34 JNT	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-C

Customer Sample ID: 16-07837-1-EFF-C

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029737				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	63	JNT
S16T029737				Propane, 2-methyl-1-nitro-	625-74-1	3.17	NGS	33	JNT
S16T029737				2,4,6-Tetramethyl-1-undecane	59920-26-2	3.66	NGS	41	JNT
S16T029737				Benzaldehyde	100-52-7	4.24	NGS	27	JNT
S16T029737				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	160	JNT
S16T029737				Phenol	108-95-2	4.40	NGS	38	JNT
S16T029737				D-Limonene	5989-27-5	4.86	NGS	100	JNT
S16T029737				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	32	JNT
S16T029737				Acetophenone	96-86-2	5.19	NGS	36	JNT
S16T029737				Undecane	1120-21-4	5.45	NGS	82	JNT
S16T029737				Ethanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	30	JNT
S16T029737				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	50	JNT
S16T029737				Benzothiazole	95-16-9	6.60	NGS	37	JNT
S16T029737				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	21	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-D

Customer Sample ID: 16-07837-1-EFF-D

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029738				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	68	JNT
S16T029738				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	140	JNT
S16T029738				D-Limonene	5989-27-5	4.86	NGS	76	JNT
S16T029738				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	21	JNT
S16T029738				Undecane	1120-21-4	5.45	NGS	53	JNT
S16T029738				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	74	JNT
S16T029738				Benzothiazole	95-16-9	6.59	NGS	27	JNT
S16T029738				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	17	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-E

Customer Sample ID: 16-07837-1-EFF-E

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029739				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	27 JNT	
S16T029739				Hydroxylamine, O-decyl-	29812-79-1	3.67	NGS	29 JNT	
S16T029739				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	120 JNT	
S16T029739				Phenol	108-95-2	4.40	NGS	31 JNT	
S16T029739				D-Limonene	5989-27-5	4.86	NGS	59 JNT	
S16T029739				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	16 JNT	
S16T029739				Undecane	1120-21-4	5.45	NGS	43 JNT	
S16T029739				Heptane, 2,4,6-trimethyl-	2613-61-8	5.51	NGS	16 JNT	
S16T029739				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	58 JNT	
S16T029739				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	14 JNT	
S16T029739				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.18	NGS	41 JNT	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-F

Customer Sample ID: 16-07837-1-EFF-F

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029740				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	30 JNT	
S16T029740				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	110 JNT	
S16T029740				D-Limonene	5989-27-5	4.86	NGS	50 JNT	
S16T029740				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	13 JNT	
S16T029740				Undecane	1120-21-4	5.45	NGS	57 JNT	
S16T029740				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	64 JNT	
S16T029740				Benzothiazole	95-16-9	6.59	NGS	28 JNT	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-G

Customer Sample ID: 16-07837-1-EFF-G

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029741				Cyclotrisiloxane, hexamethyl-	541-05-9	2.92	NGS	170	JNT
S16T029741				Heptane, 2,4-dimethyl-	2213-23-2	2.98	NGS	52	JNT
S16T029741				Octane, 4-methyl-	2216-34-4	3.34	NGS	35	JNT
S16T029741				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	190	JNT
S16T029741				1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	36	JNT
S16T029741				D-Limonene	5989-27-5	4.86	NGS	58	JNT
S16T029741				Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	80	JNT
S16T029741				2,3-Dimethyldecane	17312-44-6	5.39	NGS	30	JNT
S16T029741				Undecane	1120-21-4	5.46	NGS	170	JNT
S16T029741				2,6-Dimethyldecane	13150-81-7	5.50	NGS	27	JNT
S16T029741				Decamethylcyclopentasiloxane	541-02-6	5.72	NGS	51	JNT
S16T029741				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	15	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-EFF-H

Customer Sample ID: 16-07837-1-EFF-H

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029742				Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	73 JNT	
S16T029742				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	80 JNT	
S16T029742				Cyclohexane, 1-methyl-5-(1-met	1461-27-4	4.86	NGS	40 JNT	
S16T029742				Undecane	1120-21-4	5.44	NGS	31 JNT	
S16T029742				Decane, 2,4,6-trimethyl-	62108-27-4	5.50	NGS	14 JNT	
S16T029742				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	49 JNT	
S16T029742				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.18	NGS	53 JNT	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-A

Customer Sample ID: 16-07837-1-IN-A

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029743				Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	110 JNT	
S16T029743				Propane, 2-methyl-1-nitro-	625-74-1	3.20	NGS	57 JNT	
S16T029743				Heptane, 4-methyl-	589-53-7	3.40	NGS	29 JNT	
S16T029743				3-Hexanone, 5-methyl-	623-56-3	3.53	NGS	150 JNT	
S16T029743				2,4,6-Tetramethyl-1-undecene	59920-26-2	3.66	NGS	66 JNT	
S16T029743				Benzaldehyde	100-52-7	4.25	NGS	30 JNT	
S16T029743				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	350 JNT	
S16T029743				Phenol	108-95-2	4.41	NGS	46 JNT	
S16T029743				1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	25 JNT	
S16T029743				D-Limonene	9899-27-5	4.86	NGS	150 JNT	
S16T029743				2,6-Dimethyldecane	13150-81-7	5.10	NGS	54 JNT	
S16T029743				Acetophenone	98-86-2	5.19	NGS	52 JNT	
S16T029743				Undecane	1120-21-4	5.45	NGS	160 JNT	
S16T029743				Decane, 2,4,6-trimethyl-	82108-27-4	5.50	NGS	24 JNT	
S16T029743				Ethanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	27 JNT	
S16T029743				Decamethylcyclopentasiloxane	541-02-6	5.72	NGS	110 JNT	
S16T029743				Ethanol, 2-phenoxy-	122-99-6	6.52	NGS	55 JNT	
S16T029743				Benzothiazole	95-16-9	6.60	NGS	47 JNT	
S16T029743				Dodecane, 2,7,10-trimethyl-	74645-98-0	6.90	NGS	47 JNT	
S16T029743				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.96	NGS	12 JNT	
S16T029743				Dodecamethylcyclotrihexasiloxane	540-97-6	7.07	NGS	39 JNT	
S16T029743				Undecane, 3,7-dimethyl-	17301-29-0	7.26	NGS	30 JNT	
S16T029743				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.19	NGS	70 JNT	

NA = Not Analyzed, ND = Not Detected
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: 20162747

SDG Number:

Customer Sample ID: 16-07837-1-IN-H

Customer Sample ID: 16-07837-1-IN-H

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029750				Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	41	JNT
S16T029750				3-Hexanone, 5-methyl-	623-56-3	3.53	NGS	130	JNT
S16T029750				3-Hexanol, 5-methyl-	623-55-2	3.63	NGS	38	JNT
S16T029750				Cyclotetrasiloxane, octamethyl-	556-67-2	4.35	NGS	77	JNT
S16T029750				Decane, 2,4,6-trimethyl-	62108-27-4	5.09	NGS	5.6	JNT
S16T029750				Undecane	1120-21-4	5.44	NGS	25	JNT
S16T029750				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	41	JNT

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

John Duf
10/20/16

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-A

Customer Sample ID: 16-08068-1-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029755			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029755			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029755			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029755			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029755			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029755			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029755			112-40-3	Dodecane	NGS	92	<0.60	36	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029755			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029755			629-59-4	Tetradecane	NGS	93	<3.9	6.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029755			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029755			629-50-5	Tridecane	NGS	88	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029755			629-78-7	Heptadecane	NGS	95	<2.4	2.5	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029755			629-62-9	Pentadecane	NGS	100	<3.0	3.5	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-B

Customer Sample ID: 16-08068-1-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 #2															
S16T029756			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029756			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029756			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029756			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029756			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029756			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029756			112-40-3	Dodecane	NGS	92	<0.60	57	n/a	n/a	n/a	n/a	0.55	n/a	E
S16T029756			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029756			629-59-4	Tetradecane	NGS	93	<3.9	7.5	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029756			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029756			629-50-5	Tridecane	NGS	88	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029756			629-78-7	Heptadecane	NGS	95	<2.4	3.2	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029756			629-62-9	Pentadecane	NGS	100	<3.0	4.5	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850
SDG Number:
Customer Sample ID: 16-08068-1-EFF-C
Customer Sample ID: 16-08068-1-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029757			3891-98-3	2,6,10-Trimethyldodecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U
S16T029757			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a U
S16T029757			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029757			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a U
S16T029757			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a U
S16T029757			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a U
S16T029757			112-40-3	Dodecane	NGS	92	<0.60	58	n/a	n/a	n/a	n/a	0.55	n/a	n/a E
S16T029757			544-76-3	Hexadecane-	NGS	110	<3.3	5.5	n/a	n/a	n/a	n/a	3.3	n/a	n/a J
S16T029757			629-59-4	Tetradecane	NGS	93	<3.9	9.3	n/a	n/a	n/a	n/a	3.9	n/a	n/a J
S16T029757			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029757			629-50-5	Tridecane	NGS	88	<1.6	32	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029757			629-78-7	Heptadecane	NGS	95	<2.4	6.0	n/a	n/a	n/a	n/a	2.4	n/a	n/a J
S16T029757			629-62-9	Pentadecane	NGS	100	<3.0	9.2	n/a	n/a	n/a	n/a	3.0	n/a	n/a J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-D

Customer Sample ID: 16-08068-1-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029758			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029758			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029758			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029758			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029758			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029758			84-86-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029758			112-40-3	Dodecane	NGS	92	<0.60	34	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029758			544-76-3	Hexadecane-	NGS	110	<3.3	4.7	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T029758			629-59-4	Tetradecane	NGS	93	<3.9	7.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029758			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029758			629-50-5	Tridecane	NGS	88	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029758			629-78-7	Heptadecane	NGS	95	<2.4	4.9	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029758			629-62-9	Pentadecane	NGS	100	<3.0	6.6	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-E

Customer Sample ID: 16-08068-1-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029759			3891-98-3	2,6,10-Trimethyldodecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029759			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029759			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029759			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029759			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029759			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029759			112-40-3	Dodecane	NGS	92	<0.60	25	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029759			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029759			629-59-4	Tetradecane	NGS	93	<3.9	6.0	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029759			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029759			629-50-5	Tridecane	NGS	88	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029759			629-78-7	Heptadecane	NGS	95	<2.4	3.4	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029759			629-62-9	Pentadecane	NGS	100	<3.0	5.6	n/a	n/a	n/a	n/a	3.0	n/a	J

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-F

Customer Sample ID: 16-08068-1-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029760			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029760			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029760			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029760			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029760			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029760			84-86-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029760			112-40-3	Dodecane	NGS	92	<0.60	30	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029760			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029760			629-59-4	Tetradecane	NGS	93	<3.9	4.2	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029760			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029760			629-50-5	Tridecane	NGS	88	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029760			629-78-7	Heptadecane	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029760			629-62-9	Pentadecane	NGS	100	<3.0	3.9	n/a	n/a	n/a	n/a	3.0	n/a	J

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850
SDG Number:
Customer Sample ID: 16-08068-1-EFF-G
Customer Sample ID: 16-08068-1-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029761			3891-98-3	2,6,10-Trimethyldodecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029761			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029761			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029761			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029761			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029761			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029761			112-40-3	Dodecane	NGS	92	<0.60	49	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029761			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029761			629-59-4	Tetradecane	NGS	93	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029761			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029761			629-50-5	Tridecane	NGS	88	<1.6	7.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029761			629-78-7	Heptadecane	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029761			629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-H

Customer Sample ID: 16-08068-1-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029762			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029762			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029762			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029762			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029762			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029762			84-86-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029762			112-40-3	Dodecane	NGS	92	<0.60	21	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029762			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029762			629-59-4	Tetradecane	NGS	93	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029762			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029762			629-50-5	Tridecane	NGS	88	<1.6	8.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029762			629-78-7	Heptadecane	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029762			629-62-9	Pentadecane	NGS	100	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-IN-A

Customer Sample ID: 16-08068-1-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029763			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a/U
S16T029763			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a/U
S16T029763			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a/U
S16T029763			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a/U
S16T029763			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a/U
S16T029763			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a/U
S16T029763			112-40-3	Dodecane	NGS	92	<0.60	13	n/a	n/a	n/a	n/a	0.55		n/a
S16T029763			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a/U
S16T029763			629-59-4	Tetradecane	NGS	93	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a/U
S16T029763			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a/U
S16T029763			629-50-5	Tridecane	NGS	88	<1.6	7.3	n/a	n/a	n/a	n/a	1.6		n/a/J
S16T029763			629-78-7	Heptadecane	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a/U
S16T029763			629-62-9	Pentadecane	NGS	100	<3.0	3.0	n/a	n/a	n/a	n/a	3.0		n/a/J

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

J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850
SDG Number:
Customer Sample ID: 16-08068-1-IN-H
Customer Sample ID: 16-08068-1-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029768			3891-98-3	2,6,10-Trimethyldecane	NGS	89	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U
S16T029768			95-48-7	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	n/a U
S16T029768			108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029768			92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	n/a U
S16T029768			78-46-6	Dibutyl butylphosphonate	NGS	98	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	n/a U
S16T029768			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	n/a U
S16T029768			112-40-3	Dodecane	NGS	92	<0.60	33	n/a	n/a	n/a	n/a	0.55	n/a	n/a
S16T029768			544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T029768			629-59-4	Tetradecane	NGS	93	<3.9	4.2	n/a	n/a	n/a	n/a	3.9	n/a	n/a J
S16T029768			126-73-8	Tributyl phosphate	NGS	75	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T029768			629-50-5	Tridecane	NGS	88	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029768			629-78-7	Heptadecane	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T029768			629-62-9	Pentadecane	NGS	100	<3.0	3.3	n/a	n/a	n/a	n/a	3.0	n/a	n/a J

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Cartridge Evaluation
Data Summary Report

John Dwyer
10/20/16

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-A

Customer Sample ID: 16-08068-1-EFF-A

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029755				Propanoic acid, 2,2-dimethyl-	75-98-9	3.21	NGS	35	JNT
S16T029755				Heptanal	111-71-7	3.66	NGS	40	JNT
S16T029755				Cycloetrasiloxane, octamethyl	556-67-2	4.37	NGS	120	JNT
S16T029755				Nonane, 2,2,3-trimethyl-	55499-04-2	4.49	NGS	58	JNT
S16T029755				Decane	124-185	4.56	NGS	14	JNT
S16T029755				D-Limonene	5989-27-5	4.86	NGS	120	JNT
S16T029755				Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	90	JNT
S16T029755				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	20	JNT
S16T029755				Acetophenone	98-96-2	5.19	NGS	31	JNT
S16T029755				2,3-Dimethyldecane	17312-44-6	5.39	NGS	26	JNT
S16T029755				Undecane	1120-21-4	5.45	NGS	82	JNT
S16T029755				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	82	JNT
S16T029755				Hexanoic acid, 2-ethyl-	149-57-5	5.85	NGS	28	JNT
S16T029755				Undecane, 2-methyl-	7045718	6.00	NGS	5.2	JNT
S16T029755				Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.2	JNT
S16T029755				Benzothiazole	95-16-9	6.60	NGS	40	JNT
S16T029755				Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	33	JNT
S16T029755				Dodecamethylcyclodioxane	540-97-6	7.07	NGS	28	JNT
S16T029755				Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	21	JNT
S16T029755				Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	12	JNT
S16T029755			BLINK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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J - Estimated

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162850
SDG Number:
Customer Sample ID: 16-08068-1-EFF-B
Customer Sample ID: 16-08068-1-EFF-B

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029756				Cyclotrisiloxane, hexamethyl-	541-05-9	2.89	NGS	30 JNT	
S16T029756				Propanoic acid, 2,2-dimethyl-	75-98-9	3.28	NGS	80 JNT	
S16T029756				Heptanal	111-71-7	3.67	NGS	53 JNT	
S16T029756				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	190 JNT	
S16T029756				2,2,7,7-Tetramethyloctane	1071-31-4	4.48	NGS	28 JNT	
S16T029756				Decane	124185	4.57	NGS	20 JNT	
S16T029756				3-Hexanol, 2,2-dimethyl-	4209-90-9	4.60	NGS	28 JNT	
S16T029756				D-Limonene	5989-27-5	4.86	NGS	130 JNT	
S16T029756				Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	130 JNT	
S16T029756				Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	39 JNT	
S16T029756				Acetophenone	98-96-2	5.19	NGS	63 JNT	
S16T029756				2,3-Dimethyldecane	17312-44-6	5.39	NGS	25 JNT	
S16T029756				Undecane	1120-21-4	5.45	NGS	140 JNT	
S16T029756				Hydroxylamine, O-decyl-	29812-79-1	5.50	NGS	30 JNT	
S16T029756				Ethanol, 2-(hexyloxy)-	112-25-4	5.53	NGS	32 JNT	
S16T029756				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	88 JNT	
S16T029756				Undecane, 2-methyl-	7045718	6.00	NGS	6.8 JNT	
S16T029756				Undecane, 3-methyl-	1002433	6.05	NGS	7.7 JNT	
S16T029756				Benzothiazole	95-16-9	6.61	NGS	72 JNT	
S16T029756				Ethylene diacrylate	2274-11-5	6.67	NGS	26 JNT	
S16T029756				Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	55 JNT	
S16T029756				Dodecamethylcyclotetrasiloxane	540-97-6	7.07	NGS	36 JNT	
S16T029756				Dodecane, 4,6-dimethyl-	61141728	7.27	NGS	37 JNT	
S16T029756				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.41	NGS	17 JNT	
S16T029756			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-C

Customer Sample ID: 16-08068-1-EFF-C

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029757				Propanoic acid, 2,2-dimethyl-	75-98-9	3.27	NGS	48 JNT	
S16T029757				Heptanal	111-71-7	3.67	NGS	38 JNT	
S16T029757				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	140 JNT	
S16T029757				Decane	124185	4.56	NGS	15 JNT	
S16T029757				D-Limonene	5989-27-5	4.86	NGS	67 JNT	
S16T029757				Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	84 JNT	
S16T029757				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	28 JNT	
S16T029757				Acetophenone	98-96-2	5.19	NGS	47 JNT	
S16T029757				Undecane	1120-21-4	5.45	NGS	99 JNT	
S16T029757				Ethanol, 2-(hexyloxy)-	112-25-4	5.53	NGS	26 JNT	
S16T029757				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	66 JNT	
S16T029757				Hexanoic acid, 2-ethyl-	149-57-5	5.86	NGS	31 JNT	
S16T029757				Undecane, 2-methyl-	7045718	6.00	NGS	6.1 JNT	
S16T029757				Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.7 JNT	
S16T029757				Benzo[h]azole	95-16-9	6.61	NGS	59 JNT	
S16T029757				Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	38 JNT	
S16T029757				Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	31 JNT	
S16T029757				Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	26 JNT	
S16T029757				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.40	NGS	15 JNT	
S16T029757				Propanoic acid, 2-methyl-, 1-(74381-40-1	9.18	NGS	28 JNT	
S16T029757		BLINK		Chrysene-D12	1719-03-5	14.03	NGS	11	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-D

Customer Sample ID: 16-08068-1-EFF-D

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029758				Propanoic acid, 2,2-dimethyl-	75-98-9	3.26	NGS	43	JNT
S16T029758				Heptanal	111-71-7	3.67	NGS	40	JNT
S16T029758				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	140	JNT
S16T029758				Decane	124185	4.56	NGS	12	JNT
S16T029758				D-Limonene	5989-27-5	4.86	NGS	84	JNT
S16T029758				Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	82	JNT
S16T029758				Decane, 2,4,6-trimethyl-	82108-27-4	5.11	NGS	27	JNT
S16T029758				Acetophenone	98-86-2	5.19	NGS	42	JNT
S16T029758				Undecane	1120-21-4	5.45	NGS	90	JNT
S16T029758				Etanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	27	JNT
S16T029758				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	76	JNT
S16T029758				Heptanoic acid, 2-ethyl-	3274-29-1	5.86	NGS	34	JNT
S16T029758				Undecane, 2-methyl-	7045718	6.00	NGS	6.4	JNT
S16T029758				Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.1	JNT
S16T029758				Benzothiazole	95-16-9	6.61	NGS	48	JNT
S16T029758				Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	38	JNT
S16T029758				Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	33	JNT
S16T029758				Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	23	JNT
S16T029758				Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	10	JNT
S16T029758		BLNK		Chrysene-D12	1719-03-5	14.03	NGS	11	

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J - Estimated

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T - Tentatively Identified Compound

N - Named TIC

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-E

Customer Sample ID: 16-08068-1-EFF-E

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029759				Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	26	JNT
S16T029759				Propanoic acid, 2,2-dimethyl-	75-98-9	3.15	NGS	32	JNT
S16T029759				Heptanal	111-71-7	3.66	NGS	27	JNT
S16T029759				Cycloetrasiloxane, octamethyl	556-67-2	4.35	NGS	110	JNT
S16T029759				Decane	124185	4.56	NGS	7.8	JNT
S16T029759				D-Limonene	5989-27-5	4.86	NGS	83	JNT
S16T029759				Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	76	JNT
S16T029759				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	25	JNT
S16T029759				Acetophenone	98-96-2	5.19	NGS	31	JNT
S16T029759				Undecane	1120-21-4	5.45	NGS	82	JNT
S16T029759				Decamethylcyclopentasiloxane	541-02-6	5.72	NGS	66	JNT
S16T029759				Benzothiazole	95-16-9	6.60	NGS	48	JNT
S16T029759				Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.89	NGS	28	JNT
S16T029759				Dodecamethylcyclhexasiloxane	540-97-6	7.07	NGS	27	JNT
S16T029759				Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	19	JNT
S16T029759				Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	7.6	JNT
S16T029759			BLINK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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J - Estimated

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-F

Customer Sample ID: 16-08068-1-EFF-F

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029760				Cyclotetrasiloxane, octamethyl	558-67-2	4.35	NGS	79 JNT	
S16T029760				Cyclohexene, 1-methyl-5-(1-met	1481-27-4	4.86	NGS	46 JNT	
S16T029760				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	15 JNT	
S16T029760				Acetophenone	98-96-2	5.18	NGS	17 JNT	
S16T029760				Undecane	1120-21-4	5.45	NGS	62 JNT	
S16T029760				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	54 JNT	
S16T029760				Undecane, 2-methyl-	704-5718	6.00	NGS	5.1 JNT	
S16T029760				Undecane, 3-methyl-	1002433	6.05	NGS	5.0 JNT	
S16T029760				Benzothiazole	95-16-9	6.60	NGS	39 JNT	
S16T029760				Dodecane, 4,6-dimethyl-	61141728	7.25	NGS	12 JNT	
S16T029760				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.40	NGS	5.4 JNT	
S16T029760			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-G

Customer Sample ID: 16-08068-1-EFF-G

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029761				Cyclotrisiloxane, hexamethyl-	541-05-9	2.95	NGS	81	JNT
S16T029761				Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	120	JNT
S16T029761				Decane	124185	4.56	NGS	13	JNT
S16T029761				1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	34	JNT
S16T029761				D-Limonene	5989-27-5	4.86	NGS	36	JNT
S16T029761				Decane, 3,7-dimethyl-	17312-54-8	5.07	NGS	130	JNT
S16T029761				2,6-Dimethyldecane	13150-81-7	5.11	NGS	55	JNT
S16T029761				5-Ethyl-1-nonene	19780-74-6	5.25	NGS	30	JNT
S16T029761				2,3-Dimethyldecane	17312-44-6	5.39	NGS	26	JNT
S16T029761				Undecane	1120-21-4	5.47	NGS	150	JNT
S16T029761				Decane, 2,4,6-trimethyl-	62108-27-4	5.51	NGS	31	JNT
S16T029761				Decamethylcyclopentasiloxane	541-02-6	5.72	NGS	40	JNT
S16T029761				Undecane, 2-methyl-	7045718	6.00	NGS	8.1	JNT
S16T029761				Undecane, 3-methyl-	1002-43-3	6.05	NGS	7.2	JNT
S16T029761				Undecane, 2,6-dimethyl-	17301-23-4	6.40	NGS	7.2	JNT
S16T029761				Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	12	JNT
S16T029761			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-EFF-H

Customer Sample ID: 16-08068-1-EFF-H

Sample#	R	As	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029762				Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	40	JNT
S16T029762				2,2-Dimethyl-3-heptanone	19078-97-8	3.53	NGS	170	JNT
S16T029762				1-Octen-4-ol	40575-42-6	3.61	NGS	54	JNT
S16T029762				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	77	JNT
S16T029762				1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	29	JNT
S16T029762				D-Limonene	5989-27-5	4.85	NGS	26	JNT
S16T029762				Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	32	JNT
S16T029762				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	12	JNT
S16T029762				Acetophenone	98-96-2	5.18	NGS	17	JNT
S16T029762				Undecane	1120-21-4	5.44	NGS	43	JNT
S16T029762				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	51	JNT
S16T029762				Benzothiazole	95-16-9	6.59	NGS	25	JNT
S16T029762				Dodecane, 4,6-dimethyl-	61141728	7.25	NGS	13	JNT
S16T029762			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-IN-A

Customer Sample ID: 16-08068-1-IN-A

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029763				Propanoic acid, 2,2-dimethyl-	75-98-9	3.21	NGS	37 JNT	
S16T029763				3-Hexanone, 5-methyl-	623-56-3	3.53	NGS	62 JNT	
S16T029763				Cyclooctasiloxane, octamethyl	556-67-2	4.35	NGS	78 JNT	
S16T029763				D-Limonene	5989-27-5	4.85	NGS	27 JNT	
S16T029763				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	7.3 JNT	
S16T029763				Acetophenone	98-86-2	5.18	NGS	9.8 JNT	
S16T029763				Undecane	1120-21-4	5.44	NGS	28 JNT	
S16T029763				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	57 JNT	
S16T029763				Benzothiazole	95-16-9	6.59	NGS	17 JNT	
S16T029763				Dodecane, 4,6-dimethyl	61141-72-8	6.89	NGS	13 JNT	
S16T029763				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.25	NGS	11 JNT	
S16T029763			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162850

SDG Number:

Customer Sample ID: 16-08068-1-IN-H

Customer Sample ID: 16-08068-1-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T029768				Cyclotetrasiloxane, octamethyl	558-67-2	4.35	NGS	59	JNT
S16T029768				Decane, 2,4,6-trimethyl-	62108-27-4	5.05	NGS	16	JNT
S16T029768				Acetophenone	98-86-2	5.18	NGS	7.8	JNT
S16T029768				Undecane	1120-21-4	5.44	NGS	32	JNT
S16T029768				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	41	JNT
S16T029768				Benzo[h]thiazole	95-16-9	6.60	NGS	39	JNT
S16T029768				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.25	NGS	14	JNT
S16T029768				Dodecane, 4,6-dimethyl-	61141728	7.40	NGS	5.2	JNT
S16T029768			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

U - Less Than Detection Limit
T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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

James Duff
11/8/16

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162748

SDG Number:

Customer Sample ID: 16-08068-1-BASE-EFF

Customer Sample ID: 16-08068-1-BASE-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															
S16T029751			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
S16T029751			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029751			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029751			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029751			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029751			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029751			112-40-3	Dodecane	NGS	97	<0.60	16	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029751			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029751			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029751			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029751			629-50-5	Tridecane	NGS	96	<1.6	8.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029751			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029751			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

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162748

SDG Number:

Customer Sample ID: 16-08068-1-BASE-IN

Customer Sample ID: 16-08068-1-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029752			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
S16T029752			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029752			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029752			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029752			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029752			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029752			112-40-3	Dodecane	NGS	97	<0.60	4.0	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029752			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029752			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029752			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029752			629-50-5	Tridecane	NGS	96	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029752			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029752			629-62-9	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

U - Less Than Detection Limit

E - Outside Calibration Range

J - Estimated

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162748

SDG Number:

Customer Sample ID: 16-08068-1-BLANK-EFF

Customer Sample ID: 16-08068-1-BLANK-EFF

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029753			3891-98-3	2,6,10-Trimethylidodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029753			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029753			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029753			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029753			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029753			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029753			112-40-3	Dodecane	NGS	97	<0.60	0.90	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029753			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029753			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029753			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029753			629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029753			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029753			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

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162748

SDG Number:

Customer Sample ID: 16-08068-1-BLANK-IN

Customer Sample ID: 16-08068-1-BLANK-IN

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029754			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
S16T029754			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029754			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029754			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029754			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029754			84-86-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029754			112-40-3	Dodecane	NGS	97	<0.60	1.3	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029754			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029754			629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029754			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029754			629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029754			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029754			629-62-9	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

U - Less Than Detection Limit

E - Outside Calibration Range

J - Estimated

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162748
SDG Number:
Customer Sample ID: 16-08068-1-IN-B
Customer Sample ID: 16-08068-1-IN-B

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029764			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
S16T029764			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029764			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029764			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029764			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029764			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029764			112-40-3	Dodecane	NGS	97	<0.60	89	n/a	n/a	n/a	n/a	0.55	n/a	E
S16T029764			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029764			629-59-4	Tetradecane	NGS	120	<3.9	15	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029764			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029764			629-50-5	Tridecane	NGS	96	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029764			629-78-7	Heptadecane	NGS	110	<2.4	3.7	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029764			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

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162748
SDG Number:
Customer Sample ID: 16-08068-1-IN-C
Customer Sample ID: 16-08068-1-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029765			3891-98-3	2,6,10-Trimethyldecane	NGS	110	<3.9	8.8	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029765			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029765			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029765			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029765			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029765			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029765			112-40-3	Dodecane	NGS	97	<0.60	50	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029765			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029765			629-59-4	Tetradecane	NGS	120	<3.9	16	n/a	n/a	n/a	n/a	3.9	n/a	
S16T029765			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029765			629-50-5	Tridecane	NGS	96	<1.6	22	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029765			629-78-7	Heptadecane	NGS	110	<2.4	2.5	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T029765			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
E - Outside Calibration Range
J - Estimated
NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162748
SDG Number:
Customer Sample ID: 16-08068-1-IN-D
Customer Sample ID: 16-08068-1-IN-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029766			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
S16T029766			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029766			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029766			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029766			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029766			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029766			112-40-3	Dodecane	NGS	97	<0.60	62	n/a	n/a	n/a	n/a	0.55	n/a	E
S16T029766			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029766			629-59-4	Tetradecane	NGS	120	<3.9	6.3	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029766			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029766			629-50-5	Tridecane	NGS	96	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029766			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029766			629-62-9	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

U - Less Than Detection Limit

E - Outside Calibration Range

J - Estimated

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162748

SDG Number:

Customer Sample ID: 16-08068-1-IN-E

Customer Sample ID: 16-08068-1-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T029767			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
S16T029767			95-48-7	2-Methylphenol	NGS	98	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T029767			108-39-4M	Cresol (m & p)	NGS	97	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029767			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T029767			78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T029767			84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T029767			112-40-3	Dodecane	NGS	97	<0.60	9.5	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T029767			544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029767			629-59-4	Tetradecane	NGS	120	<3.9	8.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T029767			126-73-8	Tributyl phosphate	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029767			629-50-5	Tridecane	NGS	96	<1.6	4.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029767			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029767			629-62-9	Pentadecane	NGS	120	<3.0	3.8	n/a	n/a	n/a	n/a	3.0	n/a	J

U - Less Than Detection Limit

E - Outside Calibration Range

J - Estimated

NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-EFF
Customer Sample ID: 16-08068-2-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															
S16T029711			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029711			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029711			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029711			75-35-4	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029711			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029711			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
S16T029711			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
S16T029711			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T029711			71-36-3	1-Butanol	NGS	140	<8.9	53	n/a	n/a	n/a	n/a	8.9		n/a Ya
S16T029711			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T029711			71-23-8	1-Propanol	NGS	120	<3.0	62	n/a	n/a	n/a	n/a	3.0		n/a
S16T029711			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
S16T029711			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T029711			78-93-3	2-Butanone	NGS	93	<1.9	3.6	n/a	n/a	n/a	n/a	1.9		n/a J
S16T029711			110-43-0	2-Heptanone	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029711			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029711			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029711			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.2	n/a	n/a	n/a	n/a	1.7		n/a J
S16T029711			106-35-4	3-Heptanone	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029711			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T029711			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029711			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029711			57-64-1	Acetone	NGS	88	<4.3	29	n/a	n/a	n/a	n/a	4.3		n/a
S16T029711			75-05-8	Acetonitrile	NGS	91	<1.8	120	n/a	n/a	n/a	n/a	1.8		n/a
S16T029711			98-86-2	Acetophenone	NGS	98	<2.6	7.4	n/a	n/a	n/a	n/a	2.6		n/a J
S16T029711			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T029711			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T029711			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-EFF
Customer Sample ID: 16-08068-2-BASE-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T029711			71-43-2	Benzene	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029711			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029711			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029711			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029711			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029711			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029711			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029711			124-18-5	Decane	NGS	94	<2.8	6.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029711			64-17-5	Ethanol	NGS	110	<7.4	11	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T029711			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029711			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029711			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029711			75-09-2	Methylene Chloride	NGS	100	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029711			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029711			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029711			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029711			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029711			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029711			100-42-5	Styrene	NGS	100	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029711			127-18-4	Tetrachloroethene	NGS	110	<1.6	25	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029711			108-88-3	Toluene	NGS	98	<1.5	2.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029711			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029711			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

Y - Comment
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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-EFF
Customer Sample ID: 16-08068-2-BASE-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029711			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029711			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029711			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029711			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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 of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-IN
Customer Sample ID: 16-08068-2-BASE-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029712			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029712			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029712			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029712			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			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
S16T029712			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
S16T029712			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029712			71-36-3	1-Butanol	NGS	140	<8.9	130	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029712			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029712			71-23-8	1-Propanol	NGS	120	<3.0	80	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029712			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
S16T029712			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029712			78-93-3	2-Butanone	NGS	93	<1.9	18	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029712			110-43-0	2-Heptanone	NGS	97	<1.6	29	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			591-78-6	2-Hexanone	NGS	95	<1.2	8.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029712			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029712			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.3	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029712			106-35-4	3-Heptanone	NGS	97	<1.5	170	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029712			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	2.2	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029712			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029712			67-64-1	Acetone	NGS	88	<4.3	60	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029712			75-05-8	Acetonitrile	NGS	91	<1.8	160	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029712			98-96-2	Acetophenone	NGS	98	<2.6	5.1	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029712			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029712			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029712			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
a - LCS Outside Range
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NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-IN
Customer Sample ID: 16-08068-2-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 #2															
S16T029712			71-43-2	Benzene	NGS	98	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029712			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029712			123-72-8	Butanal	NGS	110	<2.1	4.8	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T029712			109-74-0	Butanenitrile	NGS	97	<1.2	2.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029712			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029712			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029712			124-18-5	Decane	NGS	94	<2.8	3.5	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029712			64-17-5	Ethanol	NGS	110	<7.4	64	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029712			141-78-6	Ethyl acetate	NGS	82	<1.5	2.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029712			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			110-54-3	Hexane	NGS	96	<1.7	6.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029712			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			126-98-7	Methacrylonitrile	NGS	99	<1.6	7.2	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			75-09-2	Methylene Chloride	NGS	100	<2.7	2.7	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029712			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029712			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029712			110-59-8	Pentanitrile	NGS	97	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029712			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029712			110-86-1	Pyridine	NGS	130	<3.8	4.2	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029712			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029712			127-18-4	Tetrachloroethene	NGS	110	<1.6	17	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029712			108-88-3	Toluene	NGS	98	<1.5	6.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029712			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029712			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	4.7	n/a	n/a	n/a	n/a	1.6	n/a	J

Y - Comment
a - LCS Outside Range
U - Less Than Detection Limit
J - Estimated
NA = Not Analyzed, ND = Not Detected
E - Outside Calibration Range

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BASE-IN
Customer Sample ID: 16-08068-2-BASE-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															
S16T029712			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029712			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029712			142-82-5	n-Heptane	NGS	96	<1.4	4.8	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029712			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-EFF
Customer Sample ID: 16-08068-2-BLANK-EFF

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029713			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029713			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029713			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029713			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			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
S16T029713			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
S16T029713			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029713			71-36-3	1-Butanol	NGS	140	<8.9	46	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029713			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029713			71-23-8	1-Propanol	NGS	120	<3.0	94	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029713			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
S16T029713			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029713			78-93-3	2-Butanone	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029713			110-43-0	2-Heptanone	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029713			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029713			78-94-4	3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029713			106-35-4	3-Heptanone	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029713			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029713			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029713			67-64-1	Acetone	NGS	88	<4.3	15	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029713			75-05-8	Acetonitrile	NGS	91	<1.8	200	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029713			98-86-2	Acetophenone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029713			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029713			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029713			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-EFF
Customer Sample ID: 16-08068-2-BLANK-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															
S16T029713			71-43-2	Benzene	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029713			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029713			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029713			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029713			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029713			57-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029713			124-18-5	Decane	NGS	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029713			64-17-5	Ethanol	NGS	110	<1.4	21	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029713			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029713			628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			75-09-2	Methylene Chloride	NGS	100	<2.7	3.7	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029713			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029713			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029713			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029713			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029713			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			127-18-4	Tetrachloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029713			108-88-3	Toluene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029713			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-EFF
Customer Sample ID: 16-08068-2-BLANK-EFF

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029713			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029713			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029713			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029713			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

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J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-IN
Customer Sample ID: 16-08068-2-BLANK-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029714			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029714			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029714			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029714			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			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
S16T029714			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
S16T029714			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029714			71-36-3	1-Butanol	NGS	140	<8.9	41	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029714			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029714			71-23-8	1-Propanol	NGS	120	<3.0	75	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029714			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
S16T029714			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029714			78-93-3	2-Butanone	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029714			110-43-0	2-Heptanone	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029714			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029714			78-94-4	3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029714			106-35-4	3-Heptanone	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029714			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029714			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029714			67-64-1	Acetone	NGS	88	<4.3	13	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029714			75-05-8	Acetonitrile	NGS	91	<1.8	140	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029714			98-86-2	Acetophenone	NGS	98	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029714			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029714			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029714			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
a - LCS Outside Range

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-IN
Customer Sample ID: 16-08068-2-BLANK-IN

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029714			71-43-2	Benzene	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029714			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029714			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029714			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029714			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029714			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029714			124-18-5	Decane	NGS	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029714			84-17-5	Ethanol	NGS	110	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029714			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029714			828-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029714			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029714			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029714			110-59-8	Pentanitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029714			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029714			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			127-18-4	Tetrachloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029714			108-88-3	Toluene	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029714			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-BLANK-IN
Customer Sample ID: 16-08068-2-BLANK-IN

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029714			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029714			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029714			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029714			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746

Survey ID: 16-08068

Customer Sample ID: 16-08068-2-IN-B

Customer Sample ID: 16-08068-2-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															
S16T029724			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029724			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029724			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029724			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029724			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029724			542-75-6	1,3-Dichloropropene (Total)	NGS		n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029724			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
S16T029724			123-91-1	1,4-Dioxane	NGS	100	<1.7	3.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029724			71-36-3	1-Butanol	NGS	140	<8.9	640	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029724			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029724			71-23-8	1-Propanol	NGS	120	<3.0	430	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029724			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
S16T029724			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029724			78-93-3	2-Butanone	NGS	93	<1.9	510	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029724			110-43-0	2-Heptanone	NGS	97	<1.6	68	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029724			591-78-6	2-Hexanone	NGS	95	<1.2	48	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029724			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029724			78-94-4	3-Buten-2-one	NGS	89	<1.7	37	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029724			106-35-4	3-Heptanone	NGS	97	<1.5	410	n/a	n/a	n/a	n/a	1.5	n/a	E
S16T029724			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029724			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029724			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029724			67-64-1	Acetone	NGS	88	<4.3	6.3E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029724			75-05-8	Acetonitrile	NGS	91	<1.8	960	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029724			98-86-2	Acetophenone	NGS	98	<2.6	27	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029724			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029724			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029724			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746

Survey ID: 16-08068

Customer Sample ID: 16-08068-2-IN-B

Customer Sample ID: 16-08068-2-IN-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															
S16T029724			71-43-2	Benzene	NGS	98	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029724			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029724			123-72-8	Butanal	NGS	110	<2.1	47	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029724			109-74-0	Butanenitrile	NGS	97	<1.2	51	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029724			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029724			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029724			75-00-3	Chloroethane	NGS	98	<1.9	6.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029724			57-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029724			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029724			124-18-5	Decane	NGS	94	<2.8	14	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029724			64-17-5	Ethanol	NGS	110	<1.4	540	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029724			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029724			100-41-4	Ethylbenzene	NGS	100	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029724			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029724			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029724			628-73-9	Hexanenitrile	NGS	100	<1.5	6.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029724			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029724			75-09-2	Methylene Chloride	NGS	100	<2.7	3.9	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029724			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029724			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029724			110-59-8	Pentanitrile	NGS	97	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029724			107-12-0	Propanenitrile	NGS	96	<1.4	61	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029724			110-86-1	Pyridine	NGS	130	<3.8	29	n/a	n/a	n/a	n/a	3.8	n/a	
S16T029724			100-42-5	Styrene	NGS	100	<1.6	3.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029724			127-18-4	Tetrachloroethene	NGS	110	<1.6	52	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029724			108-88-3	Toluene	NGS	98	<1.5	14	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029724			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029724			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	130	n/a	n/a	n/a	n/a	1.6	n/a	

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-B
Customer Sample ID: 16-08068-2-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															
S16T029724			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029724			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029724			142-82-5	n-Heptane	NGS	96	<1.4	19	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029724			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-C
Customer Sample ID: 16-08068-2-IN-C

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Roc %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029725			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029725			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029725			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029725			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029725			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029725			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
S16T029725			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
S16T029725			123-91-1	1,4-Dioxane	NGS	100	<1.7	4.3	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029725			71-36-3	1-Butanol	NGS	140	<8.9	740	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029725			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029725			71-23-8	1-Propanol	NGS	120	<3.0	460	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029725			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
S16T029725			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029725			78-93-3	2-Butanone	NGS	93	<1.9	550	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029725			110-43-0	2-Heptanone	NGS	97	<1.6	76	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029725			591-78-6	2-Hexanone	NGS	95	<1.2	31	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029725			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029725			78-94-4	3-Buten-2-one	NGS	89	<1.7	35	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029725			106-35-4	3-Heptanone	NGS	97	<1.5	420	n/a	n/a	n/a	n/a	1.5	n/a	E
S16T029725			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029725			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029725			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	6.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029725			87-64-1	Acetone	NGS	88	<4.3	7.1E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029725			75-05-8	Acetonitrile	NGS	91	<1.8	1.0E+03	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029725			98-86-2	Acetophenone	NGS	98	<2.6	53	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029725			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029725			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029725			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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

J - Estimated

U - Less Than Detection Limit

Y - Comment
a - LCS Outside Range

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746

Survey ID: 16-08068

Customer Sample ID: 16-08068-2-IN-C

Customer Sample ID: 16-08068-2-IN-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															
S16T029725			71-43-2	Benzene	NGS	98	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029725			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029725			123-72-8	Butanal	NGS	110	<2.1	39	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029725			109-74-0	Butanenitrile	NGS	97	<1.2	56	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029725			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029725			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029725			75-00-3	Chloroethane	NGS	98	<1.9	6.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029725			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029725			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029725			124-18-5	Decane	NGS	94	<2.8	18	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029725			64-17-5	Ethanol	NGS	110	<7.4	620	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029725			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029725			100-41-4	Ethylbenzene	NGS	100	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029725			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029725			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029725			628-73-9	Hexanenitrile	NGS	100	<1.5	5.2	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029725			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029725			75-09-2	Methylene Chloride	NGS	100	<2.7	3.0	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029725			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029725			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029725			110-59-8	Pentanenitrile	NGS	97	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029725			107-12-0	Propanenitrile	NGS	96	<1.4	70	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029725			110-86-1	Pyridine	NGS	130	<3.8	30	n/a	n/a	n/a	n/a	3.8	n/a	
S16T029725			100-42-5	Styrene	NGS	100	<1.6	2.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029725			127-18-4	Tetrachloroethene	NGS	110	<1.6	48	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029725			108-88-3	Toluene	NGS	98	<1.5	9.1	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029725			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029725			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-C
Customer Sample ID: 16-08068-2-IN-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															
S16T029725			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029725			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029725			142-82-5	n-Heptane	NGS	96	<1.4	12	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029725			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746

Survey ID: 16-08068

Customer Sample ID: 16-08068-2-IN-D

Customer Sample ID: 16-08068-2-IN-D

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029726		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029726		79-00-5		1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726		75-34-3		1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029726		75-35-4		1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029726		107-06-2		1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029726		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
S16T029726		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
S16T029726		123-91-1		1,4-Dioxane	NGS	100	<1.7	3.5	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029726		71-36-3		1-Butanol	NGS	140	<8.9	550	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029726		111-70-6		1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029726		71-23-8		1-Propanol	NGS	120	<3.0	380	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029726		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
S16T029726		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029726		78-93-3		2-Butanone	NGS	93	<1.9	400	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029726		110-43-0		2-Heptanone	NGS	97	<1.6	43	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029726		591-78-6		2-Hexanone	NGS	95	<1.2	42	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029726		534-22-5		2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029726		78-94-4		3-Buten-2-one	NGS	89	<1.7	30	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029726		106-35-4		3-Heptanone	NGS	97	<1.5	260	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726		106-68-3		3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029726		105-42-0		4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029726		108-10-1		4-Methyl-2-Pentanone	NGS	97	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029726		67-64-1		Acetone	NGS	88	<4.3	5.9E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029726		75-05-8		Acetonitrile	NGS	91	<1.8	970	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029726		98-86-2		Acetophenone	NGS	98	<2.6	19	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029726		107-13-1		Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029726		107-18-6		Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029726		107-05-1		Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
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U - Less Than Detection Limit
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E - Outside Calibration Range
NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746

Survey ID: 16-08068

Customer Sample ID: 16-08068-2-IN-D

Customer Sample ID: 16-08068-2-IN-D

Sample#	R	AM	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029726			71-43-2	Benzene	NGS	98	<1.2	9.1	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029726			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029726			123-72-8	Butanal	NGS	110	<2.1	30	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029726			109-74-0	Butanenitrile	NGS	97	<1.2	42	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029726			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029726			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726			75-00-3	Chloroethane	NGS	98	<1.9	5.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029726			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029726			124-18-5	Decane	NGS	94	<2.8	9.5	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029726			64-17-5	Ethanol	NGS	110	<7.4	530	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029726			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029726			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029726			628-73-9	Hexanenitrile	NGS	100	<1.5	5.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029726			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029726			75-09-2	Methylene Chloride	NGS	100	<2.7	3.2	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029726			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029726			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029726			110-59-8	Pentanitrile	NGS	97	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029726			107-12-0	Propanenitrile	NGS	96	<1.4	62	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029726			110-86-1	Pyridine	NGS	130	<3.8	26	n/a	n/a	n/a	n/a	3.8	n/a	
S16T029726			100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029726			127-18-4	Tetrachloroethene	NGS	110	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029726			108-88-3	Toluene	NGS	98	<1.5	10	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029726			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029726			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	130	n/a	n/a	n/a	n/a	1.6	n/a	

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-D
Customer Sample ID: 16-08068-2-IN-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029726			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029726			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029726			142-82-5	n-Heptane	NGS	96	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029726			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

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J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-E
Customer Sample ID: 16-08068-2-IN-E

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Dot Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029727			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029727			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029727			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029727			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029727			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
S16T029727			123-91-1	1,4-Dioxane	NGS	100	<1.7	3.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029727			71-36-3	1-Butanol	NGS	140	<8.9	560	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029727			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029727			71-23-8	1-Propanol	NGS	120	<3.0	340	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029727			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
S16T029727			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029727			78-93-3	2-Butanone	NGS	93	<1.9	300	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029727			110-43-0	2-Heptanone	NGS	97	<1.6	41	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			591-78-6	2-Hexanone	NGS	95	<1.2	30	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029727			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029727			78-94-4	3-Buten-2-one	NGS	89	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029727			106-35-4	3-Heptanone	NGS	97	<1.5	260	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029727			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029727			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	2.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029727			87-64-1	Acetone	NGS	88	<4.3	4.2E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029727			75-05-8	Acetonitrile	NGS	91	<1.8	1000	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029727			98-86-2	Acetophenone	NGS	98	<2.6	21	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029727			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029727			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029727			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-E
Customer Sample ID: 16-08068-2-IN-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															
S16T029727			71-43-2	Benzene	NGS	98	<1.2	8.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029727			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029727			123-72-8	Butanal	NGS	110	<2.1	17	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029727			109-74-0	Butanenitrile	NGS	97	<1.2	41	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029727			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			75-00-3	Chloroethane	NGS	98	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029727			67-56-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029727			124-18-5	Decane	NGS	94	<2.8	6.9	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029727			64-17-5	Ethanol	NGS	110	<7.4	500	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029727			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029727			628-73-9	Hexanenitrile	NGS	100	<1.5	3.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029727			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029727			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029727			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029727			110-59-8	Pentanitrile	NGS	97	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029727			107-12-0	Propanenitrile	NGS	96	<1.4	65	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029727			110-86-1	Pyridine	NGS	130	<3.8	18	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029727			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029727			127-18-4	Tetrachloroethene	NGS	110	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029727			108-88-3	Toluene	NGS	98	<1.5	6.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029727			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029727			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-E
Customer Sample ID: 16-08068-2-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029727			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029727			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029727			142-82-5	n-Heptane	NGS	96	<1.4	12	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029727			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-F
Customer Sample ID: 16-08068-2-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															
S16T029728			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029728			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029728			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029728			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029728			542-75-6	1,3-Dichloropropene (Total)	NGS		n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029728			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
S16T029728			123-91-1	1,4-Dioxane	NGS	100	<1.7	2.3	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029728			71-36-3	1-Butanol	NGS	140	<8.9	460	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029728			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029728			71-23-8	1-Propanol	NGS	120	<3.0	290	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029728			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
S16T029728			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029728			78-93-3	2-Butanone	NGS	93	<1.9	270	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029728			110-43-0	2-Heptanone	NGS	97	<1.6	36	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029728			591-78-6	2-Hexanone	NGS	95	<1.2	26	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029728			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029728			78-94-4	3-Buten-2-one	NGS	89	<1.7	12	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029728			106-35-4	3-Heptanone	NGS	97	<1.5	220	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029728			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029728			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029728			67-64-1	Acetone	NGS	88	<4.3	3.7E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029728			75-05-8	Acetonitrile	NGS	91	<1.8	720	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029728			98-86-2	Acetophenone	NGS	98	<2.6	14	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029728			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029728			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029728			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
a - LCS Outside Range
U - Less Than Detection Limit
J - Estimated
E - Outside Calibration Range
NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-F
Customer Sample ID: 16-08068-2-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															
S16T029728			71-43-2	Benzene	NGS	98	<1.2	7.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029728			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029728			123-72-8	Butanal	NGS	110	<2.1	15	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029728			109-74-0	Butanenitrile	NGS	97	<1.2	31	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029728			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.5	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029728			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			75-00-3	Chloroethane	NGS	98	<1.9	7.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029728			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029728			124-18-5	Decane	NGS	94	<2.8	5.4	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029728			64-17-5	Ethanol	NGS	110	<7.4	360	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029728			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029728			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029728			628-73-9	Hexanenitrile	NGS	100	<1.5	2.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029728			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029728			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029728			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029728			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029728			110-59-8	Pentanenitrile	NGS	97	<1.6	8.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029728			107-12-0	Propanenitrile	NGS	96	<1.4	50	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029728			110-86-1	Pyridine	NGS	130	<3.8	15	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029728			100-42-5	Styrene	NGS	100	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029728			127-18-4	Tetrachloroethene	NGS	110	<1.6	8.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029728			108-88-3	Toluene	NGS	98	<1.5	5.1	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029728			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029728			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	

Y - Comment
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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-F
Customer Sample ID: 16-08068-2-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															
S16T029728			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029728			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029728			142-82-5	n-Heptane	NGS	96	<1.4	8.8	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029728			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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 of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-G
Customer Sample ID: 16-08068-2-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															
S16T029729			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029729			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029729			75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029729			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029729			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
S16T029729			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
S16T029729			123-91-1	1,4-Dioxane	NGS	100	<1.7	2.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029729			71-36-3	1-Butanol	NGS	140	<8.9	470	n/a	n/a	n/a	n/a	8.9	n/a	
S16T029729			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029729			71-23-8	1-Propanol	NGS	120	<3.0	250	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029729			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
S16T029729			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029729			78-93-3	2-Butanone	NGS	93	<1.9	300	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029729			110-43-0	2-Heptanone	NGS	97	<1.6	28	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029729			591-78-6	2-Hexanone	NGS	95	<1.2	30	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029729			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029729			78-94-4	3-Buten-2-one	NGS	89	<1.7	22	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029729			106-35-4	3-Heptanone	NGS	97	<1.5	170	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029729			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029729			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029729			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	3.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029729			67-64-1	Acetone	NGS	88	<4.3	3.6E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029729			75-05-8	Acetonitrile	NGS	91	<1.8	3.2E+03	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029729			98-96-2	Acetophenone	NGS	98	<2.6	11	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029729			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029729			107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T029729			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

Y - Comment
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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-G
Customer Sample ID: 16-08068-2-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															
S16T029729			71-43-2	Benzene	NGS	98	<1.2	6.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029729			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029729			123-72-8	Butanal	NGS	110	<2.1	28	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029729			109-74-0	Butanenitrile	NGS	97	<1.2	30	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029729			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029729			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			75-00-3	Chloroethane	NGS	98	<1.9	3.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029729			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029729			124-18-5	Decane	NGS	94	<2.8	4.3	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029729			64-17-5	Ethanol	NGS	110	<7.4	320	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029729			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029729			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029729			828-73-9	Hexanenitrile	NGS	100	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029729			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029729			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029729			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029729			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029729			110-59-8	Pentanenitrile	NGS	97	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029729			107-12-0	Propanenitrile	NGS	96	<1.4	47	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029729			110-86-1	Pyridine	NGS	130	<3.8	20	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029729			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029729			127-18-4	Tetrachloroethene	NGS	110	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029729			108-88-3	Toluene	NGS	98	<1.5	5.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029729			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029729			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	99	n/a	n/a	n/a	n/a	1.6	n/a	

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162746
Survey ID: 16-08068
Customer Sample ID: 16-08068-2-IN-G
Customer Sample ID: 16-08068-2-IN-G

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029729			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029729			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029729			142-82-5	n-Heptane	NGS	96	<1.4	8.5	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029729			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

U - Less Than Detection Limit

J - Estimated

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

Opinion
10/12/16

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-EFF

Customer Sample ID: 16-07837-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029691		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029691		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029691		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029691		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029691		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029691		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029691		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a U
S16T029691		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029691		71-36-3		1-Butanol	NGS	120	<8.9	26	n/a	n/a	n/a	n/a	n/a	8.9	n/a Y
S16T029691		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029691		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U
S16T029691		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029691		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029691		78-93-3		2-Butanone	NGS	100	<1.9	5.4	n/a	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029691		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029691		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029691		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029691		78-94-4		3-Buten-2-one	NGS	100	<1.7	2.4	n/a	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029691		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029691		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T029691		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029691		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029691		67-64-1		Acetone	NGS	89	<4.3	36	n/a	n/a	n/a	n/a	n/a	4.3	n/a
S16T029691		75-05-8		Acetonitrile	NGS	90	<1.8	15	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S16T029691		98-86-2		Acetophenone	NGS	96	<2.6	6.2	n/a	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029691		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029691		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-EFF

Customer Sample ID: 16-07837-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029691			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029691			71-43-2	Benzene	NGS	97	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029691			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029691			123-72-8	Butanal	NGS	110	<2.1	4.0	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T029691			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029691			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029691			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029691			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029691			124-18-5	Decane	NGS	95	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029691			84-17-5	Ethanol	NGS	99	<7.4	15	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T029691			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029691			110-54-3	Hexane	NGS	97	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029691			828-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029691			75-09-2	Methylene Chloride	NGS	98	<2.7	4.0	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029691			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029691			88-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029691			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029691			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029691			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029691			100-42-5	Styrene	NGS	100	<1.6	3.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029691			127-18-4	Tetrachloroethene	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029691			108-88-3	Toluene	NGS	96	<1.5	3.8	n/a	n/a	n/a	n/a	1.5	n/a	J

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-EFF

Customer Sample ID: 16-07837-2-BASE-EFF

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029691			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029691			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029691			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029691			123-85-4	n-Butyl acetate	NGS	94	<1.4	1.8	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029691			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029691			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

N - Named TIC
Q - Qualitative
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a - LCS Outside Range
T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-BASE-IN
Customer Sample ID: 16-07837-2-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 #2															
S16T029692		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	2.6	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029692		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029692		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029692		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029692		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029692		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029692		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029692		71-36-3		1-Butanol	NGS	120	<8.9	45	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029692		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029692		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029692		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029692		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029692		78-93-3		2-Butanone	NGS	100	<1.9	9.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029692		110-43-0		2-Heptanone	NGS	95	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029692		591-78-6		2-Hexanone	NGS	92	<1.2	2.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029692		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029692		78-94-4		3-Buten-2-one	NGS	100	<1.7	5.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029692		106-35-4		3-Heptanone	NGS	95	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029692		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029692		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029692		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	16	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029692		87-64-1		Acetone	NGS	89	<4.3	80	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029692		75-05-8		Acetonitrile	NGS	90	<1.8	23	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029692		98-86-2		Acetophenone	NGS	96	<2.6	5.4	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029692		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029692		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-BASE-IN
Customer Sample ID: 16-07837-2-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029692			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029692			71-43-2	Benzene	NGS	97	<1.2	7.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029692			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029692			123-72-8	Butanal	NGS	110	<2.1	7.6	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T029692			109-74-0	Butanenitrile	NGS	94	<1.2	3.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029692			56-23-5	Carbon tetrachloride	NGS	100	<1.6	1.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029692			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029692			67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692			110-82-7	Cyclohexane	NGS	99	<1.8	4.6	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T029692			124-18-5	Decane	NGS	95	<2.8	10	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029692			64-17-5	Ethanol	NGS	99	<7.4	73	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029692			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692			100-41-4	Ethylbenzene	NGS	99	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029692			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029692			110-54-3	Hexane	NGS	97	<1.7	11	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029692			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029692			75-09-2	Methylene Chloride	NGS	98	<2.7	2.8	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029692			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029692			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029692			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029692			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029692			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029692			100-42-5	Styrene	NGS	100	<1.6	2.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029692			127-18-4	Tetrachloroethene	NGS	100	<1.6	150	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029692			108-88-3	Toluene	NGS	96	<1.5	27	n/a	n/a	n/a	n/a	1.5	n/a	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-IN

Customer Sample ID: 16-07837-2-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 #2															
S16T029692			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029692			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	5.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029692			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029692			123-86-4	n-Butyl acetate	NGS	94	<1.4	2.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029692			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029692			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BLANK1

Customer Sample ID: 16-07837-2-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029693		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029693		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029693		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029693		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029693		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029693		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029693		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T029693		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T029693		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		n/a UY
S16T029693		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T029693		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U
S16T029693		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T029693		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T029693		78-93-3		2-Butanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029693		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029693		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029693		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029693		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
S16T029693		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029693		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T029693		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T029693		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029693		67-64-1		Acetone	NGS	89	<4.3	6.6	n/a	n/a	n/a	n/a	4.3		n/a J
S16T029693		75-05-8		Acetonitrile	NGS	90	<1.8	4.4	n/a	n/a	n/a	n/a	1.8		n/a J
S16T029693		98-86-2		Acetophenone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T029693		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T029693		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BLANK1

Customer Sample ID: 16-07837-2-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029693			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029693			71-43-2	Benzene	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029693			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029693			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029693			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029693			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029693			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029693			124-18-5	Decane	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029693			84-17-5	Ethanol	NGS	99	<7.4	7.8	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T029693			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029693			828-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029693			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029693			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029693			110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029693			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029693			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			127-18-4	Tetrachloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			108-88-3	Toluene	NGS	96	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-BLANK1
Customer Sample ID: 16-07837-2-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029693			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029693			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029693			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029693			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029693			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029693			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-BLANK2
Customer Sample ID: 16-07837-2-BLANK2

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029694		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029694		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029694		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029694		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029694		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029694		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029694		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a U
S16T029694		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029694		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	n/a	8.9	n/a UY
S16T029694		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029694		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U
S16T029694		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029694		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029694		78-93-3		2-Butanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029694		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029694		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029694		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029694		78-94-4		3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029694		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029694		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T029694		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029694		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029694		87-64-1		Acetone	NGS	89	<4.3	<4.3	n/a	n/a	n/a	n/a	n/a	4.3	n/a U
S16T029694		75-05-8		Acetonitrile	NGS	90	<1.8	14	n/a	n/a	n/a	n/a	n/a	1.8	n/a
S16T029694		98-86-2		Acetophenone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029694		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029694		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BLANK2

Customer Sample ID: 16-07837-2-BLANK2

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029694			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029694			71-43-2	Benzene	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029694			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029694			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029694			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029694			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029694			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029694			124-18-5	Decane	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029694			84-17-5	Ethanol	NGS	99	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029694			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029694			828-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029694			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029694			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029694			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029694			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029694			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			127-18-4	Tetrachloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			108-88-3	Toluene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-BLANK2
Customer Sample ID: 16-07837-2-BLANK2

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029694			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029694			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029694			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029694			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029694			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029694			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-A

Customer Sample ID: 16-07837-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029695		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	1.4	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029695		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029695		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029695		75-35-4		1,1-Dichloroethene	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029695		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029695		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029695		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029695		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029695		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UY
S16T029695		111-70-5		1-Heptanol	NGS	86	<5.6	6.8	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T029695		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029695		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029695		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029695		78-93-3		2-Butanone	NGS	100	<1.9	5.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029695		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029695		591-78-6		2-Hexanone	NGS	92	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029695		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029695		78-94-4		3-Buten-2-one	NGS	100	<1.7	3.6	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029695		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029695		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029695		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029695		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029695		67-64-1		Acetone	NGS	89	<4.3	4.4	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029695		75-05-8		Acetonitrile	NGS	90	<1.8	5.9	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029695		98-86-2		Acetophenone	NGS	96	<2.6	11	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029695		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029695		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-A

Customer Sample ID: 16-07837-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029695			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T029695			71-43-2	Benzene	NGS	97	<1.2	2.1	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T029695			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T029695			123-72-8	Butanal	NGS	110	<2.1	3.4	n/a	n/a	n/a	n/a	2.1	n/a	n/a J
S16T029695			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T029695			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029695			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029695			75-00-3	Chloroethane	NGS	95	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T029695			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029695			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T029695			124-18-5	Decane	NGS	95	<2.8	19	n/a	n/a	n/a	n/a	2.8	n/a	n/a J
S16T029695			84-17-5	Ethanol	NGS	99	<7.4	16	n/a	n/a	n/a	n/a	7.4	n/a	n/a J
S16T029695			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029695			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029695			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029695			110-54-3	Hexane	NGS	97	<1.7	1.8	n/a	n/a	n/a	n/a	1.7	n/a	n/a J
S16T029695			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029695			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029695			75-09-2	Methylene Chloride	NGS	98	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	n/a	n/a J
S16T029695			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a U
S16T029695			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T029695			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029695			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a U
S16T029695			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a U
S16T029695			100-42-5	Styrene	NGS	100	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a J
S16T029695			127-18-4	Tetrachloroethene	NGS	100	<1.6	72	n/a	n/a	n/a	n/a	1.6	n/a	n/a J
S16T029695			108-88-3	Toluene	NGS	96	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	n/a J

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

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-A

Customer Sample ID: 16-07837-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029695			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029695			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029695			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029695			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029695			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029695			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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T - Tentatively Identified Compound

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U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-B
Customer Sample ID: 16-07837-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029696		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029696		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029696		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029696		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	3.0	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029696		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029696		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029696		71-36-3		1-Butanol	NGS	120	<8.9	57	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029696		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029696		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029696		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029696		1709-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029696		78-93-3		2-Butanone	NGS	100	<1.9	7.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029696		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696		591-78-6		2-Hexanone	NGS	92	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029696		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029696		78-94-4		3-Buten-2-one	NGS	100	<1.7	3.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029696		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029696		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029696		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029696		67-64-1		Acetone	NGS	89	<4.3	44	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029696		75-05-8		Acetonitrile	NGS	90	<1.8	210	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029696		98-86-2		Acetophenone	NGS	96	<2.6	12	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029696		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029696		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-B
Customer Sample ID: 16-07837-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029696			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029696			71-43-2	Benzene	NGS	97	<1.2	2.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029696			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029696			123-72-8	Butanal	NGS	110	<2.1	3.3	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T029696			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029696			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			75-00-3	Chloroethane	NGS	95	<1.9	4.5	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029696			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029696			124-18-5	Decane	NGS	95	<2.8	14	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029696			64-17-5	Ethanol	NGS	99	<7.4	65	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029696			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696			110-54-3	Hexane	NGS	97	<1.7	2.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029696			828-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696			75-09-2	Methylene Chloride	NGS	98	<2.7	5.9	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029696			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029696			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029696			110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029696			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029696			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029696			100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029696			127-18-4	Tetrachloroethene	NGS	100	<1.6	66	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029696			108-88-3	Toluene	NGS	96	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	J

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-B

Customer Sample ID: 16-07837-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029696			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029696			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	2.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029696			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	3.0	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029696			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029696			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029696			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-C
Customer Sample ID: 16-07837-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029697		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029697		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029697		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029697		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029697		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029697		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029697		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029697		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029697		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UY
S16T029697		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029697		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029697		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029697		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029697		78-93-3		2-Butanone	NGS	100	<1.9	5.3	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029697		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029697		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029697		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029697		78-94-4		3-Buten-2-one	NGS	100	<1.7	3.0	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029697		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029697		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029697		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029697		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029697		67-64-1		Acetone	NGS	89	<4.3	42	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029697		75-05-8		Acetonitrile	NGS	90	<1.8	270	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029697		98-86-2		Acetophenone	NGS	96	<2.6	8.7	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029697		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029697		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-C

Customer Sample ID: 16-07837-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029697			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T029697			71-43-2	Benzene	NGS	97	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	n/a
S16T029697			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a
S16T029697			123-72-8	Butanal	NGS	110	<2.1	3.3	n/a	n/a	n/a	n/a	2.1	n/a	n/a
S16T029697			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a
S16T029697			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T029697			75-00-3	Chloroethane	NGS	95	<1.9	4.3	n/a	n/a	n/a	n/a	1.9	n/a	n/a
S16T029697			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T029697			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T029697			124-18-5	Decane	NGS	95	<2.8	9.5	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T029697			84-17-5	Ethanol	NGS	99	<7.4	130	n/a	n/a	n/a	n/a	7.4	n/a	n/a
S16T029697			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T029697			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T029697			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			110-54-3	Hexane	NGS	97	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a	n/a
S16T029697			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a
S16T029697			126-98-7	Methacrylonitrile	NGS	100	<1.6	3.8	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a
S16T029697			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a
S16T029697			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a
S16T029697			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S16T029697			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a
S16T029697			100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			127-18-4	Tetrachloroethene	NGS	100	<1.6	64	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029697			108-88-3	Toluene	NGS	96	<1.5	2.1	n/a	n/a	n/a	n/a	1.5	n/a	n/a

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-C

Customer Sample ID: 16-07837-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029697			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029697			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	4.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029697			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029697			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029697			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029697			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

N - Named TIC
Q - Qualitative
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a - LCS Outside Range
T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-D

Customer Sample ID: 16-07837-2-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029698			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029698			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029698			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029698			75-35-4	1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029698			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029698			542-75-6	1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029698			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a U
S16T029698			123-91-1	1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029698			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	n/a	8.9	n/a UY
S16T029698			111-70-6	1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029698			71-23-8	1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U
S16T029698			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029698			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029698			78-93-3	2-Butanone	NGS	100	<1.9	2.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029698			110-43-0	2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a Y
S16T029698			591-78-6	2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a Y
S16T029698			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a Y
S16T029698			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a Y
S16T029698			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a Y
S16T029698			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T029698			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029698			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029698			87-64-1	Acetone	NGS	89	<4.3	86	n/a	n/a	n/a	n/a	n/a	4.3	n/a
S16T029698			75-05-8	Acetonitrile	NGS	90	<1.8	1.2E+03	n/a	n/a	n/a	n/a	n/a	1.8	n/a E
S16T029698			98-86-2	Acetophenone	NGS	96	<2.6	9.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029698			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029698			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U

NA = Not Analyzed, ND = Not Detected
J - Estimated
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Y - Comment
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T - Tentatively Identified Compound
N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-D

Customer Sample ID: 16-07837-2-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029698			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T029698			71-43-2	Benzene	NGS	97	<1.2	1.3	n/a	n/a	n/a	n/a	1.2		n/a J
S16T029698			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029698			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T029698			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T029698			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029698			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029698			75-00-3	Chloroethane	NGS	95	<1.9	5.7	n/a	n/a	n/a	n/a	1.9		n/a J
S16T029698			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029698			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T029698			124-18-5	Decane	NGS	95	<2.8	9.9	n/a	n/a	n/a	n/a	2.8		n/a J
S16T029698			84-17-5	Ethanol	NGS	99	<7.4	240	n/a	n/a	n/a	n/a	7.4		n/a
S16T029698			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029698			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029698			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029698			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T029698			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T029698			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029698			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T029698			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T029698			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T029698			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029698			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T029698			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T029698			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T029698			127-18-4	Tetrachloroethene	NGS	100	<1.6	43	n/a	n/a	n/a	n/a	1.6		n/a
S16T029698			108-88-3	Toluene	NGS	96	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-D
Customer Sample ID: 16-07837-2-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029698			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029698			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029698			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029698			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029698			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029698			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-E

Customer Sample ID: 16-07837-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029699			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029699			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029699			75-35-4	1,1-Dichloroethene	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029699			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			542-75-5	1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029699			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029699			123-91-1	1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029699			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UY
S16T029699			111-70-6	1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029699			71-23-8	1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029699			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029699			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029699			78-93-3	2-Butanone	NGS	100	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029699			110-43-0	2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			591-78-6	2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029699			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029699			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
S16T029699			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029699			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029699			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029699			67-64-1	Acetone	NGS	89	<4.3	240	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029699			75-05-8	Acetonitrile	NGS	90	<1.8	370	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029699			98-86-2	Acetophenone	NGS	96	<2.6	4.8	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029699			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029699			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-E

Customer Sample ID: 16-07837-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029699			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029699			71-43-2	Benzene	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029699			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029699			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029699			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029699			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			75-00-3	Chloroethane	NGS	95	<1.9	5.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029699			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029699			124-18-5	Decane	NGS	95	<2.8	5.1	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029699			84-17-5	Ethanol	NGS	99	<7.4	280	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029699			141-78-6	Ethyl acetate	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029699			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029699			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029699			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029699			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			107-12-0	Propanenitrile	NGS	98	<1.4	2.3	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029699			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029699			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			127-18-4	Tetrachloroethene	NGS	100	<1.6	29	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029699			108-88-3	Toluene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-E

Customer Sample ID: 16-07837-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029699			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029699			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	58	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029699			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029699			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029699			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029699			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-F

Customer Sample ID: 16-07837-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029700		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029700		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029700		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029700		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029700		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029700		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029700		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UY
S16T029700		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029700		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029700		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029700		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029700		78-93-3		2-Butanone	NGS	100	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029700		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029700		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029700		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
S16T029700		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029700		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029700		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029700		87-64-1		Acetone	NGS	89	<4.3	120	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029700		75-05-8		Acetonitrile	NGS	90	<1.8	330	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029700		98-86-2		Acetophenone	NGS	96	<2.6	3.0	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029700		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029700		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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N - Named TIC
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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-F

Customer Sample ID: 16-07837-2-EFF-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															
S16T029700			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029700			71-43-2	Benzene	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029700			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029700			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029700			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029700			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			75-00-3	Chloroethane	NGS	95	<1.9	3.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029700			67-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029700			124-18-5	Decane	NGS	95	<2.8	3.5	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029700			64-17-5	Ethanol	NGS	99	<7.4	230	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029700			141-78-6	Ethyl acetate	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029700			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029700			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029700			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029700			110-59-8	Pentanitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			107-12-0	Propanenitrile	NGS	98	<1.4	2.7	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029700			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029700			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			127-18-4	Tetrachloroethene	NGS	100	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029700			108-88-3	Toluene	NGS	96	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-F
Customer Sample ID: 16-07837-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029700			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029700			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	58	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029700			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029700			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029700			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029700			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-G

Customer Sample ID: 16-07837-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029701			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029701			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029701			75-35-4	1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029701			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029701			542-75-6	1,3-Dichloropropene (Total)	NGS	99	<1.2	3.3	n/a	n/a	n/a	n/a	n/a	1.2	n/a
S16T029701			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a U
S16T029701			123-91-1	1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029701			71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	n/a	8.9	n/a UY
S16T029701			111-70-6	1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029701			71-23-8	1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U
S16T029701			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029701			1706-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029701			78-93-3	2-Butanone	NGS	100	<1.9	2.0	n/a	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029701			110-43-0	2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029701			591-78-6	2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029701			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029701			78-94-4	3-Buten-2-one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029701			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T029701			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029701			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029701			67-64-1	Acetone	NGS	89	<4.3	1.2E+03	n/a	n/a	n/a	n/a	n/a	4.3	n/a E
S16T029701			75-05-8	Acetonitrile	NGS	90	<1.8	490	n/a	n/a	n/a	n/a	n/a	1.8	n/a E
S16T029701			98-86-2	Acetophenone	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029701			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029701			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-EFF-G
Customer Sample ID: 16-07837-2-EFF-G

Sample#	R	As	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029701			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T029701			71-43-2	Benzene	NGS	97	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T029701			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T029701			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	n/a U
S16T029701			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T029701			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029701			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029701			75-00-3	Chloroethane	NGS	95	<1.9	5.4	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T029701			67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029701			110-82-7	Cyclohexane	NGS	99	<1.8	8.9	n/a	n/a	n/a	n/a	1.8	n/a	n/a J
S16T029701			124-18-5	Decane	NGS	95	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a	n/a J
S16T029701			64-17-5	Ethanol	NGS	99	<7.4	420	n/a	n/a	n/a	n/a	7.4	n/a	n/a
S16T029701			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029701			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029701			110-00-9	Furan	NGS	95	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n/a U
S16T029701			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T029701			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T029701			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029701			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	n/a U
S16T029701			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	n/a U
S16T029701			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T029701			110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T029701			107-12-0	Propanenitrile	NGS	98	<1.4	13	n/a	n/a	n/a	n/a	1.4	n/a	n/a
S16T029701			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	n/a U
S16T029701			100-42-5	Styrene	NGS	100	<1.6	4.9	n/a	n/a	n/a	n/a	1.6	n/a	n/a J
S16T029701			127-18-4	Tetrachloroethene	NGS	100	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	n/a
S16T029701			108-88-3	Toluene	NGS	96	<1.5	4.8	n/a	n/a	n/a	n/a	1.5	n/a	n/a J

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E - Outside Calibration Range
Y - Comment
U - Less Than Detection Limit
a - LCS Outside Range
T - Tentatively Identified Compound
N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-G

Customer Sample ID: 16-07837-2-EFF-G

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029701			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029701			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	190	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029701			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	3.3	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029701			123-86-4	n-Butyl acetate	NGS	94	<1.4	3.7	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029701			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029701			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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J - Estimated
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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-H

Customer Sample ID: 16-07837-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029702		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029702		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029702		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029702		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029702		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029702		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029702		71-36-3		1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UY
S16T029702		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029702		71-23-8		1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029702		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029702		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029702		78-93-3		2-Butanone	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029702		110-43-0		2-Heptanone	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702		591-78-6		2-Hexanone	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029702		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029702		78-94-4		3-Buten-2-one	NGS	100	<1.7	2.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029702		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702		106-88-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029702		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029702		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029702		87-64-1		Acetone	NGS	89	<4.3	2.1E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029702		75-05-8		Acetonitrile	NGS	90	<1.8	650	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029702		98-86-2		Acetophenone	NGS	96	<2.6	3.4	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029702		107-13-1		Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029702		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-H

Customer Sample ID: 16-07837-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029702			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029702			71-43-2	Benzene	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029702			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029702			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029702			109-74-0	Butanenitrile	NGS	94	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029702			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			75-00-3	Chloroethane	NGS	95	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029702			87-86-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029702			124-18-5	Decane	NGS	95	<2.8	3.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029702			64-17-5	Ethanol	NGS	99	<7.4	530	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029702			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029702			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029702			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029702			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029702			110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702			107-12-0	Propanenitrile	NGS	98	<1.4	29	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029702			110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029702			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029702			127-18-4	Tetrachloroethane	NGS	100	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029702			108-88-3	Toluene	NGS	96	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-H

Customer Sample ID: 16-07837-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029702			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029702			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	260	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029702			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029702			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029702			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029702			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-A

Customer Sample ID: 16-07837-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029703			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029703			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029703			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029703			75-35-4	1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029703			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029703			542-75-6	1,3-Dichloropropene (Total)	NGS	99	<1.2	7.9	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029703			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029703			123-91-1	1,4-Dioxane	NGS	98	<1.7	3.6	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029703			71-36-3	1-Butanol	NGS	120	<8.9	610	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029703			111-70-6	1-Heptanol	NGS	86	<5.6	8.2	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T029703			71-23-8	1-Propanol	NGS	110	<3.0	330	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029703			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029703			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029703			78-93-3	2-Butanone	NGS	100	<1.9	470	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029703			110-43-0	2-Heptanone	NGS	95	<1.6	25	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029703			591-78-6	2-Hexanone	NGS	92	<1.2	30	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029703			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029703			78-94-4	3-Buten-2-one	NGS	100	<1.7	29	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029703			106-35-4	3-Heptanone	NGS	95	<1.5	140	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029703			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029703			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029703			108-10-1	4-Methyl-2-pentanone	NGS	96	<1.9	13	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029703			67-64-1	Acetone	NGS	89	<4.3	6.2E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029703			75-05-8	Acetonitrile	NGS	90	<1.8	340	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029703			98-86-2	Acetophenone	NGS	96	<2.6	19	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029703			107-13-1	Acrylonitrile	NGS	98	<1.7	5.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029703			107-18-6	Allyl Alcohol	NGS	110	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-A

Customer Sample ID: 16-07837-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029703			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029703			71-43-2	Benzene	NGS	97	<1.2	11	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029703			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029703			123-72-8	Butanal	NGS	110	<2.1	23	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029703			109-74-0	Butanenitrile	NGS	94	<1.2	49	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029703			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029703			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029703			75-00-3	Chloroethane	NGS	95	<1.9	7.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029703			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029703			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029703			124-18-5	Decane	NGS	95	<2.8	21	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029703			64-17-5	Ethanol	NGS	99	<7.4	800	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029703			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029703			100-41-4	Ethylbenzene	NGS	99	<1.5	3.2	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029703			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029703			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029703			828-73-9	Hexanenitrile	NGS	95	<1.5	93	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029703			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029703			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029703			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029703			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029703			110-59-8	Pentanitrile	NGS	92	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029703			107-12-0	Propanenitrile	NGS	98	<1.4	70	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029703			110-86-1	Pyridine	NGS	120	<3.8	19	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029703			100-42-5	Styrene	NGS	100	<1.6	3.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029703			127-18-4	Tetrachloroethene	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029703			108-88-3	Toluene	NGS	96	<1.5	19	n/a	n/a	n/a	n/a	1.5	n/a	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-A

Customer Sample ID: 16-07837-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029703			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029703			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	130	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029703			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	7.9	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029703			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029703			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029703			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Y - Comment
U - Less Than Detection Limit

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J - Estimated
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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-B

Customer Sample ID: 16-07837-2-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029704		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029704		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029704		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029704		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	5.0	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029704		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029704		123-91-1		1,4-Dioxane	NGS	98	<1.7	3.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029704		71-36-3		1-Butanol	NGS	120	<8.9	740	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029704		111-70-6		1-Heptanol	NGS	86	<5.6	6.3	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T029704		71-23-8		1-Propanol	NGS	110	<3.0	370	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029704		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029704		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029704		78-93-3		2-Butanone	NGS	100	<1.9	440	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029704		110-43-0		2-Heptanone	NGS	95	<1.6	47	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029704		591-78-6		2-Hexanone	NGS	92	<1.2	39	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029704		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029704		78-94-4		3-Buten-2-one	NGS	100	<1.7	29	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029704		106-35-4		3-Heptanone	NGS	95	<1.5	260	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029704		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029704		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029704		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029704		57-64-1		Acetone	NGS	89	<4.3	6.7E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029704		75-05-8		Acetonitrile	NGS	90	<1.8	500	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029704		98-86-2		Acetophenone	NGS	96	<2.6	12	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029704		107-13-1		Acrylonitrile	NGS	98	<1.7	5.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029704		107-18-6		Allyl Alcohol	NGS	110	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-B

Customer Sample ID: 16-07837-2-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029704			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029704			71-43-2	Benzene	NGS	97	<1.2	12	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029704			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029704			123-72-8	Butanal	NGS	110	<2.1	23	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029704			109-74-0	Butanenitrile	NGS	94	<1.2	54	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029704			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			75-00-3	Chloroethane	NGS	95	<1.9	8.1	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029704			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029704			124-18-5	Decane	NGS	95	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029704			64-17-5	Ethanol	NGS	99	<7.4	720	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029704			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			100-41-4	Ethylbenzene	NGS	99	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			110-00-9	Furan	NGS	95	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029704			628-73-9	Hexanenitrile	NGS	95	<1.5	160	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			75-09-2	Methylene Chloride	NGS	98	<2.7	3.3	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029704			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029704			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029704			110-59-8	Pentanenitrile	NGS	92	<1.6	17	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			107-12-0	Propanenitrile	NGS	98	<1.4	86	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029704			110-86-1	Pyridine	NGS	120	<3.8	28	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029704			100-42-5	Styrene	NGS	100	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			127-18-4	Tetrachloroethene	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029704			108-88-3	Toluene	NGS	96	<1.5	14	n/a	n/a	n/a	n/a	1.5	n/a	U

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T - Tentatively Identified Compound

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Q - Qualitative

B - Blank Contamination

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-B

Customer Sample ID: 16-07837-2-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029704			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029704			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	160	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029704			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	5.0	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029704			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029704			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029704			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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: 20162744
SDG Number:
Customer Sample ID: 16-07837-2-IN-C
Customer Sample ID: 16-07837-2-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029705		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029705		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029705		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029705		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029705		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029705		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029705		123-91-1		1,4-Dioxane	NGS	98	<1.7	3.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029705		71-36-3		1-Butanol	NGS	120	<8.9	630	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029705		111-70-6		1-Heptanol	NGS	86	<5.6	7.1	n/a	n/a	n/a	n/a	5.6	n/a	J
S16T029705		71-23-8		1-Propanol	NGS	110	<3.0	280	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029705		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029705		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029705		78-93-3		2-Butanone	NGS	100	<1.9	330	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029705		110-43-0		2-Heptanone	NGS	95	<1.6	48	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029705		591-78-6		2-Hexanone	NGS	92	<1.2	36	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029705		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029705		78-94-4		3-Buten-2-one	NGS	100	<1.7	21	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029705		106-35-4		3-Heptanone	NGS	95	<1.5	270	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029705		106-88-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029705		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029705		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029705		57-64-1		Acetone	NGS	89	<4.3	5.2E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029705		75-05-8		Acetonitrile	NGS	90	<1.8	460	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029705		98-86-2		Acetophenone	NGS	96	<2.6	22	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029705		107-13-1		Acrylonitrile	NGS	98	<1.7	4.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029705		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-C

Customer Sample ID: 16-07837-2-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T029705			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029705			71-43-2	Benzene	NGS	97	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029705			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029705			123-72-8	Butanal	NGS	110	<2.1	20	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029705			109-74-0	Butanenitrile	NGS	94	<1.2	46	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029705			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029705			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705			75-00-3	Chloroethane	NGS	95	<1.9	6.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029705			67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029705			124-18-5	Decane	NGS	95	<2.8	15	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029705			64-17-5	Ethanol	NGS	99	<7.4	570	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029705			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705			100-41-4	Ethylbenzene	NGS	99	<1.5	1.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029705			110-00-9	Furan	NGS	95	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029705			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029705			628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029705			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029705			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029705			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029705			110-59-8	Pentanitrile	NGS	92	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029705			107-12-0	Propanenitrile	NGS	98	<1.4	70	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029705			110-86-1	Pyridine	NGS	120	<3.8	23	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029705			100-42-5	Styrene	NGS	100	<1.6	3.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029705			127-18-4	Tetrachloroethene	NGS	100	<1.6	71	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029705			106-88-3	Toluene	NGS	96	<1.5	11	n/a	n/a	n/a	n/a	1.5	n/a	J

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U - Less Than Detection Limit

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J - Estimated
E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-C

Customer Sample ID: 16-07837-2-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029705			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029705			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029705			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	1.8	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029705			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029705			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029705			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-D

Customer Sample ID: 16-07837-2-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029706			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029706			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029706			75-35-4	1,1-Dichloroethene	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029706			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			542-75-6	1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029706			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029706			123-91-1	1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029706			71-36-3	1-Butanol	NGS	120	<8.9	380	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029706			111-70-6	1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029706			71-23-8	1-Propanol	NGS	110	<3.0	150	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029706			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029706			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029706			78-93-3	2-Butanone	NGS	100	<1.9	450	n/a	n/a	n/a	n/a	1.9	n/a	E
S16T029706			110-43-0	2-Heptanone	NGS	95	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			591-78-6	2-Hexanone	NGS	92	<1.2	33	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029706			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029706			78-94-4	3-Buten-2-one	NGS	100	<1.7	20	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029706			106-35-4	3-Heptanone	NGS	95	<1.5	220	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029706			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029706			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	5.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029706			67-64-1	Acetone	NGS	89	<4.3	6.2E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029706			75-05-8	Acetonitrile	NGS	90	<1.8	420	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029706			98-86-2	Acetophenone	NGS	96	<2.6	4.5	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029706			107-13-1	Acrylonitrile	NGS	98	<1.7	3.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029706			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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

a - LCS Outside Range
T - Tentatively Identified Compound

N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-D

Customer Sample ID: 16-07837-2-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Roc %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029706			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029706			71-43-2	Benzene	NGS	97	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029706			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029706			123-72-8	Butanal	NGS	110	<2.1	39	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029706			109-74-0	Butanenitrile	NGS	94	<1.2	40	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029706			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			75-00-3	Chloroethane	NGS	95	<1.9	5.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029706			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029706			124-18-5	Decane	NGS	95	<2.8	4.9	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029706			84-17-5	Ethanol	NGS	99	<7.4	110	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029706			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029706			828-73-9	Hexanenitrile	NGS	95	<1.5	120	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029706			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029706			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029706			98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029706			110-59-8	Pentanenitrile	NGS	92	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029706			107-12-0	Propanenitrile	NGS	98	<1.4	66	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029706			110-96-1	Pyridine	NGS	120	<3.8	13	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029706			100-42-5	Styrene	NGS	100	<1.6	2.1	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029706			127-18-4	Tetrachloroethene	NGS	100	<1.6	31	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029706			108-98-3	Toluene	NGS	96	<1.5	8.0	n/a	n/a	n/a	n/a	1.5	n/a	J

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Y - Comment
U - Less Than Detection Limit
a - LCS Outside Range
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N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-D

Customer Sample ID: 16-07837-2-IN-D

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029706			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029706			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029706			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029706			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029706			142-82-5	n-Heptane	NGS	96	<1.4	110	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029706			10061-02-8	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-E

Customer Sample ID: 16-07837-2-IN-E

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029707			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029707			79-00-5	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029707			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU
S16T029707			75-35-4	1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T029707			107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T029707			542-75-6	1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029707			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029707			123-91-1	1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T029707			71-36-3	1-Butanol	NGS	120	<8.9	330	n/a	n/a	n/a	n/a	8.9	n/a	QY
S16T029707			111-70-6	1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029707			71-23-8	1-Propanol	NGS	110	<3.0	7.8	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029707			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029707			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T029707			78-93-3	2-Butanone	NGS	100	<1.9	340	n/a	n/a	n/a	n/a	1.9	n/a	Q
S16T029707			110-43-0	2-Heptanone	NGS	95	<1.6	45	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029707			591-78-6	2-Hexanone	NGS	92	<1.2	36	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029707			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T029707			78-94-4	3-Buten-2-one	NGS	100	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	Q
S16T029707			106-35-4	3-Heptanone	NGS	95	<1.5	280	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029707			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029707			105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029707			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	5.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029707			57-64-1	Acetone	NGS	89	<4.3	5.1E+03	n/a	n/a	n/a	n/a	4.3	n/a	EQY
S16T029707			75-05-8	Acetonitrile	NGS	90	<1.8	120	n/a	n/a	n/a	n/a	1.8	n/a	Q
S16T029707			98-86-2	Acetophenone	NGS	96	<2.6	11	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029707			107-13-1	Acrylonitrile	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T029707			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	QU

N - Named TIC
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T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-E

Customer Sample ID: 16-07837-2-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029707		107-05-1		Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T029707		71-43-2		Benzene	NGS	97	<1.2	11	n/a	n/a	n/a	n/a	1.2	n/a	QU
S16T029707		100-47-0		Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029707		123-72-8		Butanal	NGS	110	<2.1	32	n/a	n/a	n/a	n/a	2.1	n/a	Q
S16T029707		109-74-0		Butanenitrile	NGS	94	<1.2	38	n/a	n/a	n/a	n/a	1.2	n/a	Q
S16T029707		56-23-5		Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T029707		108-90-7		Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029707		75-00-3		Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T029707		87-66-3		Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T029707		110-82-7		Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	QU
S16T029707		124-18-5		Decane	NGS	95	<2.8	6.6	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029707		64-17-5		Ethanol	NGS	99	<7.4	9.3	n/a	n/a	n/a	n/a	7.4	n/a	QU
S16T029707		141-78-6		Ethyl acetate	NGS	99	<1.5	17	n/a	n/a	n/a	n/a	1.5	n/a	Q
S16T029707		100-41-4		Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029707		110-00-9		Furan	NGS	95	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T029707		110-54-3		Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T029707		828-73-9		Hexanenitrile	NGS	95	<1.5	160	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029707		126-98-7		Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T029707		75-09-2		Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	QU
S16T029707		91-20-3		Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029707		98-95-3		Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029707		110-59-8		Pentanenitrile	NGS	92	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029707		107-12-0		Propanenitrile	NGS	98	<1.4	65	n/a	n/a	n/a	n/a	1.4	n/a	Q
S16T029707		110-86-1		Pyridine	NGS	120	<3.8	22	n/a	n/a	n/a	n/a	3.8	n/a	QU
S16T029707		100-42-5		Styrene	NGS	100	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029707		127-18-4		Tetrachloroethene	NGS	100	<1.6	28	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029707		108-88-3		Toluene	NGS	96	<1.5	8.8	n/a	n/a	n/a	n/a	1.5	n/a	J

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 E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-E

Customer Sample ID: 16-07837-2-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029707			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T029707			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	120	n/a	n/a	n/a	n/a	1.6	n/a	Q
S16T029707			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T029707			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029707			142-82-5	n-Heptane	NGS	96	<1.4	14	n/a	n/a	n/a	n/a	1.4	n/a	Q
S16T029707			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU

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T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-F

Customer Sample ID: 16-07837-2-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029708		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029708		79-00-5		1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029708		75-35-4		1,1-Dichloroethane	NGS	99	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029708		107-06-2		1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029708		542-75-6		1,3-Dichloropropene (Total)	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029708		106-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T029708		123-91-1		1,4-Dioxane	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029708		71-36-3		1-Butanol	NGS	120	<8.9	380	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029708		111-70-6		1-Heptanol	NGS	86	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029708		71-23-8		1-Propanol	NGS	110	<3.0	95	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029708		108-47-4		2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T029708		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029708		78-93-3		2-Butanone	NGS	100	<1.9	290	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029708		110-43-0		2-Heptanone	NGS	95	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029708		591-78-6		2-Hexanone	NGS	92	<1.2	33	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029708		534-22-5		2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029708		78-94-4		3-Buten-2-one	NGS	100	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029708		106-35-4		3-Heptanone	NGS	95	<1.5	220	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029708		105-42-0		4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029708		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	4.2	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029708		57-64-1		Acetone	NGS	89	<4.3	4.4E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029708		75-05-8		Acetonitrile	NGS	90	<1.8	420	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029708		98-86-2		Acetophenone	NGS	96	<2.6	8.5	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029708		107-13-1		Acrylonitrile	NGS	98	<1.7	2.7	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029708		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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J - Estimated

E - Outside Calibration Range

Y - Comment

U - Less Than Detection Limit

a - LCS Outside Range

T - Tentatively Identified Compound

N - Named TIC

Q - Qualitative

B - Blank Contamination

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-F

Customer Sample ID: 16-07837-2-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029708			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029708			71-43-2	Benzene	NGS	97	<1.2	9.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029708			100-47-0	Benzonitrile	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029708			123-72-8	Butanal	NGS	110	<2.1	31	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029708			109-74-0	Butanenitrile	NGS	94	<1.2	36	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029708			56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029708			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			75-00-3	Chloroethane	NGS	95	<1.9	6.5	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029708			87-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			110-82-7	Cyclohexane	NGS	99	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029708			124-18-5	Decane	NGS	95	<2.8	5.6	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029708			84-17-5	Ethanol	NGS	99	<7.4	120	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029708			141-78-6	Ethyl acetate	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			100-41-4	Ethylbenzene	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			110-00-9	Furan	NGS	95	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029708			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029708			828-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029708			75-09-2	Methylene Chloride	NGS	98	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029708			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029708			98-95-3	Nitrobenzene	NGS	97	<2.6	3.3	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029708			110-59-8	Pentanitrile	NGS	92	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029708			107-12-0	Propanenitrile	NGS	98	<1.4	61	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029708			110-96-1	Pyridine	NGS	120	<3.8	13	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029708			100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029708			127-18-4	Tetrachloroethene	NGS	100	<1.6	20	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029708			108-88-3	Toluene	NGS	96	<1.5	7.4	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-F

Customer Sample ID: 16-07837-2-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															
S16T029708			79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029708			75-69-4	Trichlorofluoromethane	NGS	98	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029708			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029708			123-86-4	n-Butyl acetate	NGS	94	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029708			142-82-5	n-Heptane	NGS	96	<1.4	61	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029708			10061-02-6	trans-1,3-Dichloropropene	NGS	99	<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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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-G

Customer Sample ID: 16-07837-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029709		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029709		79-00-5		1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029709		75-34-3		1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029709		75-35-4		1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029709		107-06-2		1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029709		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029709		106-46-7		1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	2.0	n/a U
S16T029709		123-91-1		1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029709		71-36-3		1-Butanol	NGS	140	<8.9	350	n/a	n/a	n/a	n/a	n/a	8.9	n/a Ya
S16T029709		111-70-6		1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029709		71-23-8		1-Propanol	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U
S16T029709		108-47-4		2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029709		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029709		78-93-3		2-Butanone	NGS	93	<1.9	340	n/a	n/a	n/a	n/a	n/a	1.9	n/a
S16T029709		110-43-0		2-Heptanone	NGS	97	<1.6	43	n/a	n/a	n/a	n/a	n/a	1.6	n/a
S16T029709		591-78-6		2-Hexanone	NGS	95	<1.2	32	n/a	n/a	n/a	n/a	n/a	1.2	n/a
S16T029709		534-22-5		2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029709		78-94-4		3-Buten-2-one	NGS	89	<1.7	13	n/a	n/a	n/a	n/a	n/a	1.7	n/a
S16T029709		106-35-4		3-Heptanone	NGS	97	<1.5	270	n/a	n/a	n/a	n/a	n/a	1.5	n/a
S16T029709		106-68-3		3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T029709		105-42-0		4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029709		108-10-1		4-Methyl-2-Pentanone	NGS	97	<1.9	3.7	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029709		67-64-1		Acetone	NGS	88	<4.3	5.5E+03	n/a	n/a	n/a	n/a	n/a	4.3	n/a EY
S16T029709		75-05-8		Acetonitrile	NGS	91	<1.8	600	n/a	n/a	n/a	n/a	n/a	1.8	n/a E
S16T029709		98-86-2		Acetophenone	NGS	98	<2.6	6.3	n/a	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029709		107-13-1		Acrylonitrile	NGS	92	<1.7	2.0	n/a	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029709		107-18-6		Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U

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

N - Named TIC
Q - Qualitative
B - Blank Contamination

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-G

Customer Sample ID: 16-07837-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029709			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029709			71-43-2	Benzene	NGS	98	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029709			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029709			123-72-8	Butanal	NGS	110	<2.1	34	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029709			109-74-0	Butanenitrile	NGS	97	<1.2	36	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029709			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029709			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029709			75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029709			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029709			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029709			124-18-5	Decane	NGS	94	<2.8	4.8	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029709			84-17-5	Ethanol	NGS	110	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029709			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029709			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029709			110-00-9	Furan	NGS	94	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029709			110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029709			828-73-9	Hexanenitrile	NGS	100	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029709			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029709			75-09-2	Methylene Chloride	NGS	100	<2.7	5.0	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T029709			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029709			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029709			110-59-8	Pentanenitrile	NGS	97	<1.6	9.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029709			107-12-0	Propanenitrile	NGS	96	<1.4	58	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029709			110-86-1	Pyridine	NGS	130	<3.8	15	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029709			100-42-5	Styrene	NGS	100	<1.6	2.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029709			127-18-4	Tetrachloroethene	NGS	110	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029709			108-88-3	Toluene	NGS	98	<1.5	7.9	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-G

Customer Sample ID: 16-07837-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029709			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029709			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029709			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029709			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029709			142-82-5	n-Heptane	NGS	96	<1.4	69	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029709			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-H

Customer Sample ID: 16-07837-2-IN-H

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029710			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029710			79-00-5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029710			75-35-4	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029710			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029710			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
S16T029710			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
S16T029710			123-91-1	1,4-Dioxane	NGS	100	<1.7	2.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029710			71-38-3	1-Butanol	NGS	140	<8.9	410	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T029710			111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T029710			71-23-8	1-Propanol	NGS	120	<3.0	280	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029710			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
S16T029710			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029710			78-93-3	2-Butanone	NGS	93	<1.9	350	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029710			110-43-0	2-Heptanone	NGS	97	<1.6	45	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029710			591-78-6	2-Hexanone	NGS	95	<1.2	35	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029710			534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029710			78-94-4	3-Buten-2-one	NGS	89	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029710			106-35-4	3-Heptanone	NGS	97	<1.5	280	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029710			106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029710			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029710			108-10-1	4-Methyl-2-Pentanone	NGS	97	<1.9	3.5	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029710			57-64-1	Acetone	NGS	88	<4.3	4.9E+03	n/a	n/a	n/a	n/a	4.3	n/a	EY
S16T029710			75-05-8	Acetonitrile	NGS	91	<1.8	470	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T029710			98-86-2	Acetophenone	NGS	98	<2.6	2.8	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029710			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029710			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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Q - Qualitative
B - Blank Contamination

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-H

Customer Sample ID: 16-07837-2-IN-H

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029710			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029710			71-43-2	Benzene	NGS	98	<1.2	9.1	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029710			100-47-0	Benzonitrile	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029710			123-72-8	Butanal	NGS	110	<2.1	48	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029710			109-74-0	Butanenitrile	NGS	97	<1.2	38	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029710			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029710			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			75-00-3	Chloroethane	NGS	98	<1.9	6.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029710			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029710			124-18-5	Decane	NGS	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029710			84-17-5	Ethanol	NGS	110	<7.4	380	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029710			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029710			110-54-3	Hexane	NGS	96	<1.7	6.9	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029710			828-73-9	Hexanenitrile	NGS	100	<1.5	2.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029710			126-98-7	Methacrylonitrile	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029710			75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029710			91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029710			98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029710			110-59-8	Pentanitrile	NGS	97	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029710			107-12-0	Propanenitrile	NGS	96	<1.4	70	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029710			110-86-1	Pyridine	NGS	130	<3.8	16	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029710			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029710			127-18-4	Tetrachloroethene	NGS	110	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029710			108-88-3	Toluene	NGS	98	<1.5	7.6	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-H

Customer Sample ID: 16-07837-2-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029710			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029710			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029710			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029710			123-86-4	n-Butyl acetate	NGS	82	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029710			142-82-5	n-Heptane	NGS	96	<1.4	14	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029710			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-EFF

Customer Sample ID: 16-07837-2-BASE-EFF

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029691			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BASE-IN

Customer Sample ID: 16-07837-2-BASE-IN

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029692			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

N - Named TIC
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E - Outside Calibration Range

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BLANK1

Customer Sample ID: 16-07837-2-BLANK1

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029693			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

N - Named TIC
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T - Tentatively Identified Compound

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-BLANK2

Customer Sample ID: 16-07837-2-BLANK2

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR:TDU VOA #2									
S16T029694			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-A

Customer Sample ID: 16-07837-2-EFF-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029695				Unknown-1	--	8.25	NGS	59 JT	
S16T029695				Formamide	75-12-7	14.07	NGS	35 JNT	
S16T029695				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	250 JNT	
S16T029695				D-Limonene	5989-27-5	22.61	NGS	130 JNT	
S16T029695				Decane, 2,4,6-trimethyl-	62105-27-4	22.97	NGS	88 JNT	
S16T029695				2,6-Dimethyldecane	13150-81-7	23.11	NGS	32 JNT	
S16T029695				Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	60 JNT	
S16T029695				Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	78 JNT	
S16T029695				Unknown-2	--	24.23	NGS	330 JT	
S16T029695				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	40 JNT	
S16T029695				1,2-Benzisothiazole	272-16-2	26.34	NGS	130 JNT	
S16T029695				Unknown-3	--	26.43	NGS	57 JT	
S16T029695				1,2,3,4,5-Cyclopentanepentol	56775-25-9	26.62	NGS	27 JNT	
S16T029695				Undecane, 2-methyl-	7045-71-8	27.01	NGS	35 JNT	
S16T029695			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-B

Customer Sample ID: 16-07837-2-EFF-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029696				Formamide	75-12-7	14.09	NGS	64 JNT	
S16T029696				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	190 JNT	
S16T029696				D-Limonene	5889-27-5	22.61	NGS	100 JNT	
S16T029696				Decane, 2,4,6-trimethyl-	62108-27-4	22.98	NGS	68 JNT	
S16T029696				2,6-Dimethyldecane	13150-81-7	23.12	NGS	25 JNT	
S16T029696				Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	48 JNT	
S16T029696				3,3-Dimethylhexane	563-16-6	23.92	NGS	44 JNT	
S16T029696				Unknown-1	--	24.22	NGS	260 JT	
S16T029696				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	36 JNT	
S16T029696				Acetic acid, trifluoro-, 3,7-d	28745-07-5	25.40	NGS	25 JNT	
S16T029696				Unknown-2	--	26.00	NGS	34 JT	
S16T029696				Methanamine	100-97-0	26.22	NGS	27 JNT	
S16T029696				1,2-Benzisothiazole	272-16-2	26.34	NGS	100 JNT	
S16T029696				Unknown-3	--	26.43	NGS	42 JT	
S16T029696				Propanoic acid, 2-methyl-, 1-(	74381-40-1	26.57	NGS	41 JNT	
S16T029696				Undecane, 2-methyl-	7045-71-8	27.01	NGS	25 JNT	
S16T029696			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-C

Customer Sample ID: 16-07837-2-EFF-C

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029697				Unknown-1	--	8.25	NGS	31	JT
S16T029697				Formamide	75-12-7	14.10	NGS	93	JNT
S16T029697				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	120	JNT
S16T029697				Cyclohexene, 1-methyl-5-(1-met	1461-27-4	22.61	NGS	67	JNT
S16T029697				Decane, 2,4,6-trimethyl-	62108-27-4	22.98	NGS	45	JNT
S16T029697				Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	31	JNT
S16T029697				Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	31	JNT
S16T029697				Unknown-2	--	24.22	NGS	220	JT
S16T029697				Undecane, 2,6-dimethyl-	17301-23-4	25.26	NGS	36	JNT
S16T029697				Methanamine	100-97-0	26.23	NGS	130	JNT
S16T029697				1,2-Benzisothiazole	272-16-2	26.35	NGS	93	JNT
S16T029697				Propanoic acid, 2-methyl-, 1-(74381-40-1	26.58	NGS	41	JNT
S16T029697			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-D

Customer Sample ID: 16-07837-2-EFF-D

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029698				Methyl formate	107-31-3	4.73	NGS	31 JNT	
S16T029698				Unknown-1	--	8.27	NGS	42 JT	
S16T029698				Formamide	75-12-7	14.09	NGS	54 JNT	
S16T029698				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	81 JNT	
S16T029698				D-Limonene	5989-27-5	22.61	NGS	75 JNT	
S16T029698				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	48 JNT	
S16T029698				Undecane, 5,7-dimethyl-	17312-83-3	23.82	NGS	29 JNT	
S16T029698				Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	29 JNT	
S16T029698				Unknown-2	--	24.22	NGS	160 JT	
S16T029698				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	17 JNT	
S16T029698				Methenamine	100-97-0	26.20	NGS	180 JNT	
S16T029698				1,2-Benzisothiazole	272-16-2	26.32	NGS	31 JNT	
S16T029698				Undecane, 2-methyl-	7045-71-8	26.99	NGS	17 JNT	
S16T029698			BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-E

Customer Sample ID: 16-07837-2-EFF-E

Sample#	R	As#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029699				Methyl formate	107-31-3	4.72	NGS	43 JNT	
S16T029699				Unknown-1	-	8.29	NGS	41 JT	
S16T029699				Formamide	75-12-7	14.10	NGS	56 JNT	
S16T029699				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	52 JNT	
S16T029699				D-Limonene	5989-27-5	22.61	NGS	41 JNT	
S16T029699				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	23 JNT	
S16T029699				Unknown-2	-	24.22	NGS	100 JT	
S16T029699				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	13 JNT	
S16T029699				Methanamine	100-97-0	26.20	NGS	120 JNT	
S16T029699				1,2-Benzisothiazole	272-16-2	26.32	NGS	42 JNT	
S16T029699				Propanoic acid, 2-methyl-, 1-(74381-40-1	26.54	NGS	140 JNT	
S16T029699			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Q - Qualitative

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-F

Customer Sample ID: 16-07837-2-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029700				Methyl formate	107-31-3	4.72	NGS	41	JNT
S16T029700				Unknown-1	--	8.23	NGS	40	JT
S16T029700				Formamide	75-12-7	14.07	NGS	38	JNT
S16T029700				Cyclotetrasiloxane, octamethyl	556-87-2	20.43	NGS	54	JNT
S16T029700				D-Limonene	5989-27-5	22.61	NGS	31	JNT
S16T029700				Decane, 2,4,6-trimethyl-	52108-27-4	22.97	NGS	21	JNT
S16T029700				Unknown-2	--	24.22	NGS	100	JT
S16T029700				Methenamine	100-97-0	26.19	NGS	140	JNT
S16T029700				1,2-Benzisothiazole	272-16-2	26.32	NGS	46	JNT
S16T029700				Propanoic acid, 2-methyl-, 1-(74381-40-1	26.53	NGS	78	JNT
S16T029700			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-G

Customer Sample ID: 16-07837-2-EFF-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR:TDU VOA #2									
S16T029701				Methyl formate	107-31-3	4.72	NGS	26	JNT
S16T029701				Di(1,2,5-oxadiazolo)[3,4-b:3,4	186205-18-5	5.76	NGS	36	JNT
S16T029701				Formamide	75-12-7	14.18	NGS	35	JNT
S16T029701				Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	94	JNT
S16T029701				Heptane, 2,4-dimethyl-	2213-23-2	17.28	NGS	130	JNT
S16T029701				Octane, 3-chloro-	1117-79-9	17.67	NGS	34	JNT
S16T029701				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	210	JNT
S16T029701				1-Hexanol, 2-ethyl-	104-76-7	21.99	NGS	31	JNT
S16T029701				D-Limonene	5989-27-5	22.61	NGS	72	JNT
S16T029701				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	250	JNT
S16T029701				2,6-Dimethyldecane	13150-81-7	23.12	NGS	97	JNT
S16T029701				2,6-Dimethyl-6-trifluoroacetox	61986-67-2	23.47	NGS	38	JNT
S16T029701				Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	140	JNT
S16T029701				3,3-Dimethylhexane	563-16-6	23.93	NGS	58	JNT
S16T029701				Unknown-1	--	24.22	NGS	130	JT
S16T029701				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	22	JNT
S16T029701			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-EFF-H

Customer Sample ID: 16-07837-2-EFF-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029702				Methyl formate	107-31-3	4.72	NGS	63 JNT	
S16T029702				Unknown-1	--	8.28	NGS	36 JT	
S16T029702				Formamide	75-12-7	14.11	NGS	61 JNT	
S16T029702				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	38 JNT	
S16T029702				D-Limonene	5989-27-5	22.60	NGS	31 JNT	
S16T029702				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	18 JNT	
S16T029702				Unknown-2	--	24.22	NGS	79 JT	
S16T029702				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	9.0 JNT	
S16T029702				Methanamine	100-97-0	26.21	NGS	130 JNT	
S16T029702				1,2-Benzisothiazole	272-16-2	26.33	NGS	32 JNT	
S16T029702		BLNK		1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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E - Outside Calibration Range

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-A

Customer Sample ID: 16-07837-2-IN-A

Sample#	R	As	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029703				Di(1,2,5-oxadiazolo)[3,4-b;3,4	186205-18-5	5.24	NGS	34	JNT
S16T029703				Methoxytrimethylsilane	1825-61-2	8.69	NGS	56	JNT
S16T029703				Tetrahydrofuran	109-99-9	11.97	NGS	13	JNT
S16T029703				Ethylene Glycol	107-21-1	13.94	NGS	120	JNT
S16T029703				Oxirane, 2,3-dimethyl-, cis-	1758-33-4	14.17	NGS	250	JNT
S16T029703				Unknown-1	-	14.40	NGS	37	JT
S16T029703				Propane, 2-methyl-1-nitro-	625-74-1	16.54	NGS	64	JNT
S16T029703				Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	110	JNT
S16T029703				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	410	JNT
S16T029703				D-Limonene	5989-27-5	22.61	NGS	120	JNT
S16T029703				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	140	JNT
S16T029703				2,6-Dimethyldecane	13150-81-7	23.11	NGS	50	JNT
S16T029703				Undecane, 5,7-dimethyl-	17312-83-3	23.82	NGS	98	JNT
S16T029703				3,3-Dimethylhexane	563-16-6	23.92	NGS	83	JNT
S16T029703				Unknown-2	-	24.22	NGS	360	JT
S16T029703				Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	49	JNT
S16T029703				Ethanol, 2-phenoxy-	122-99-6	25.82	NGS	54	JNT
S16T029703				1,2-Benzisothiazole	272-16-2	26.34	NGS	62	JNT
S16T029703				Octane, 2,3,6,7-tetramethyl-	52670-34-5	26.43	NGS	55	JNT
S16T029703				Unknown-3	-	26.56	NGS	45	JT
S16T029703				1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	38	JNT
S16T029703				Undecane, 2-methyl-	7045-71-8	27.01	NGS	31	JNT
S16T029703			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-B

Customer Sample ID: 16-07837-2-IN-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029704			BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-C

Customer Sample ID: 16-07837-2-IN-C

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029705			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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a - LCS Outside Range
T - Tentatively Identified Compound

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-D

Customer Sample ID: 16-07837-2-IN-D

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029706			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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U - Less Than Detection Limit

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

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Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-E

Customer Sample ID: 16-07837-2-IN-E

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029707			BLNK	1,1,1,3,5,5,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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U - Less Than Detection Limit

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J - Estimated
E - Outside Calibration Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-F

Customer Sample ID: 16-07837-2-IN-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029708			BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

N - Named TIC
Q - Qualitative

a - LCS Outside Range
T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-G

Customer Sample ID: 16-07837-2-IN-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029709			BLNK	Unknown-1	--	8.25	NGS	22	
S16T029709			BLNK	Unknown-2	--	24.23	NGS	30	

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Q - Qualitative

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T - Tentatively Identified Compound

Y - Comment
U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20162744

SDG Number:

Customer Sample ID: 16-07837-2-IN-H

Customer Sample ID: 16-07837-2-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029710				Di(1,2,5-oxadiazolo)[3,4-b;3,4	186205-18-5	7.66	NGS	43	JNT
S16T029710				Tetrahydrofuran	109-99-9	11.98	NGS	10	JNT
S16T029710				4,8-Dioxatricyclo[5.1.0.0(3,5)	42569-59-5	14.17	NGS	51	JNT
S16T029710				Formamide	75-12-7	14.59	NGS	80	JNT
S16T029710				Acetonitrile, hydroxy-	107-16-4	16.25	NGS	30	JNT
S16T029710				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	67	JNT
S16T029710				Cyclohexene, 1-methyl-4-(1-met	7705-14-8	22.60	NGS	29	JNT
S16T029710				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	18	JNT
S16T029710				Unknown-1	--	24.22	NGS	72	BJT
S16T029710				Unknown-2	--	25.85	NGS	36	JT
S16T029710		BLNK		Unknown-1	--	8.25	NGS	22	
S16T029710		BLNK		Unknown-2	--	24.23	NGS	30	

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Cartridge Evaluation
Data Summary Report

John Dwyer
10/19/2016

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-A

Customer Sample ID: 16-08068-2-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 #2															
S16T029715			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029715			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
S16T029715			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029715			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029715			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			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
S16T029715			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
S16T029715			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029715			71-36-3	1-Butanol	NGS	130	<8.9	54	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029715			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029715			71-23-8	1-Propanol	NGS	120	<3.0	76	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029715			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
S16T029715			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029715			78-93-3	2-Butanone	NGS	95	<1.9	6.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029715			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			591-78-6	2-Hexanone	NGS	95	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029715			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029715			78-94-4	3-Buten-2-one	NGS	89	<1.7	4.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029715			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029715			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029715			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029715			67-64-1	Acetone	NGS	87	<4.3	75	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029715			75-05-8	Acetonitrile	NGS	88	14	510	n/a	n/a	n/a	n/a	18	n/a	BE
S16T029715			98-96-2	Acetophenone	NGS	94	<2.6	25	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029715			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029715			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U

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NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-A
Customer Sample ID: 16-08068-2-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 #2															
S16T029715			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029715			71-43-2	Benzene	NGS	100	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029715			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029715			123-72-8	Butanal	NGS	110	<2.1	3.2	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T029715			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029715			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			75-00-3	Chloroethane	NGS	100	<1.9	4.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029715			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029715			124-18-5	Decane	NGS	94	<2.8	17	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029715			64-17-5	Ethanol	NGS	110	<7.4	55	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029715			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029715			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			75-09-2	Methylene Chloride	NGS	98	3.9	7.8	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T029715			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029715			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029715			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029715			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029715			100-42-5	Styrene	NGS	100	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029715			127-18-4	Tetrachloroethene	NGS	110	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029715			108-88-3	Toluene	NGS	100	<1.5	2.1	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-A
Customer Sample ID: 16-08068-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029715			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029715			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	8.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029715			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029715			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029715			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029715			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-B

Customer Sample ID: 16-08068-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029716			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029716			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
S16T029716			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029716			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029716			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			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
S16T029716			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
S16T029716			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029716			71-36-3	1-Butanol	NGS	130	<8.9	72	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029716			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029716			71-23-8	1-Propanol	NGS	120	<3.0	84	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029716			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
S16T029716			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029716			78-93-3	2-Butanone	NGS	95	<1.9	8.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029716			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			591-78-6	2-Hexanone	NGS	95	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029716			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029716			78-94-4	3-Buten-2-one	NGS	89	<1.7	4.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029716			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029716			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029716			108-10-1	4-Methyl-2-pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029716			67-64-1	Acetone	NGS	87	<4.3	180	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029716			75-05-8	Acetonitrile	NGS	88	14	550	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029716			98-96-2	Acetophenone	NGS	94	<2.6	29	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029716			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029716			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-B

Customer Sample ID: 16-08068-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029716			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029716			71-43-2	Benzene	NGS	100	<1.2	2.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029716			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029716			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029716			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029716			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			75-00-3	Chloroethane	NGS	100	<1.9	4.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029716			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029716			124-18-5	Decane	NGS	94	<2.8	17	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029716			64-17-5	Ethanol	NGS	110	<7.4	150	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029716			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			110-54-3	Hexane	NGS	97	<1.7	2.6	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029716			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			75-09-2	Methylene Chloride	NGS	98	3.9	3.7	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T029716			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029716			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029716			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029716			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029716			100-42-5	Styrene	NGS	100	<1.6	2.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029716			127-18-4	Tetrachloroethene	NGS	110	<1.6	48	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029716			108-88-3	Toluene	NGS	100	<1.5	2.9	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-B
Customer Sample ID: 16-08068-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029716			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029716			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029716			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029716			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029716			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029716			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-C

Customer Sample ID: 16-08068-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029717			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029717			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
S16T029717			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029717			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029717			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			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
S16T029717			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
S16T029717			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029717			71-36-3	1-Butanol	NGS	130	<8.9	44	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029717			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029717			71-23-8	1-Propanol	NGS	120	<3.0	58	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029717			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
S16T029717			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029717			78-93-3	2-Butanone	NGS	95	<1.9	8.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029717			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			591-78-6	2-Hexanone	NGS	95	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029717			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029717			78-94-4	3-Buten-2-one	NGS	89	<1.7	4.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029717			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029717			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029717			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029717			67-64-1	Acetone	NGS	87	<4.3	280	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029717			75-05-8	Acetonitrile	NGS	88	14	910	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029717			98-86-2	Acetophenone	NGS	94	<2.6	27	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029717			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029717			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-C
Customer Sample ID: 16-08068-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029717			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029717			71-43-2	Benzene	NGS	100	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029717			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029717			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029717			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029717			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			75-00-3	Chloroethane	NGS	100	<1.9	4.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029717			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029717			124-18-5	Decane	NGS	94	<2.8	15	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029717			64-17-5	Ethanol	NGS	110	<7.4	220	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029717			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			110-54-3	Hexane	NGS	97	<1.7	2.2	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029717			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			75-09-2	Methylene Chloride	NGS	98	3.9	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029717			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029717			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029717			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029717			107-12-0	Propanenitrile	NGS	98	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029717			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029717			100-42-5	Styrene	NGS	100	<1.6	2.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029717			127-18-4	Tetrachloroethene	NGS	110	<1.6	56	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029717			108-88-3	Toluene	NGS	100	<1.5	2.8	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-C
Customer Sample ID: 16-08068-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029717			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029717			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029717			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029717			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029717			142-82-5	n-Heptane	NGS	96	<1.4	1.9	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029717			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-D

Customer Sample ID: 16-08068-2-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029718			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029718			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
S16T029718			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029718			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029718			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			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
S16T029718			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
S16T029718			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029718			71-36-3	1-Butanol	NGS	130	<8.9	76	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029718			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029718			71-23-8	1-Propanol	NGS	120	<3.0	97	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029718			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
S16T029718			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029718			78-93-3	2-Butanone	NGS	95	<1.9	6.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029718			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029718			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029718			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029718			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029718			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029718			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029718			67-64-1	Acetone	NGS	87	<4.3	280	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029718			75-05-8	Acetonitrile	NGS	88	14	2.3E+04	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029718			98-86-2	Acetophenone	NGS	94	<2.6	30	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029718			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029718			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-D
Customer Sample ID: 16-08068-2-EFF-D

Sample#	R	A/J	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029718			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029718			71-43-2	Benzene	NGS	100	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029718			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029718			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029718			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029718			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			75-00-3	Chloroethane	NGS	100	<1.9	5.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029718			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029718			124-18-5	Decane	NGS	94	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029718			64-17-5	Ethanol	NGS	110	<7.4	270	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029718			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			110-54-3	Hexane	NGS	97	<1.7	1.8	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029718			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			75-09-2	Methylene Chloride	NGS	98	3.9	5.5	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T029718			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029718			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029718			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			107-12-0	Propanenitrile	NGS	98	<1.4	5.5	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029718			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029718			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			127-18-4	Tetrachloroethene	NGS	110	<1.6	71	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029718			108-88-3	Toluene	NGS	100	<1.5	2.5	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20162851
 SDG Number:
 Customer Sample ID: 16-08068-2-EFF-D
 Customer Sample ID: 16-08068-2-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029718			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029718			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029718			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029718			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029718			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029718			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-E

Customer Sample ID: 16-08068-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029719		79-34-5		1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029719		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
S16T029719		75-34-3		1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029719		75-35-4		1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029719		107-06-2		1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719		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
S16T029719		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
S16T029719		123-91-1		1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029719		71-36-3		1-Butanol	NGS	130	<8.9	39	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029719		111-70-6		1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029719		71-23-8		1-Propanol	NGS	120	<3.0	51	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029719		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
S16T029719		1708-29-8		2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029719		78-93-3		2-Butanone	NGS	95	<1.9	3.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029719		110-43-0		2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719		591-78-6		2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029719		534-22-5		2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029719		78-94-4		3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029719		106-35-4		3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719		106-68-3		3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029719		105-42-0		4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029719		108-10-1		4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029719		67-64-1		Acetone	NGS	87	<4.3	410	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029719		75-05-8		Acetonitrile	NGS	88	14	990	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029719		98-86-2		Acetophenone	NGS	94	<2.6	17	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029719		107-13-1		Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029719		107-18-6		Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-E
Customer Sample ID: 16-08068-2-EFF-E

Sample#	R	A/I	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029719			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029719			71-43-2	Benzene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029719			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029719			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029719			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029719			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			75-00-3	Chloroethane	NGS	100	<1.9	8.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029719			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029719			124-18-5	Decane	NGS	94	<2.8	8.4	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029719			64-17-5	Ethanol	NGS	110	<7.4	320	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029719			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029719			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719			75-09-2	Methylene Chloride	NGS	98	3.9	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029719			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029719			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029719			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719			107-12-0	Propanenitrile	NGS	98	<1.4	2.6	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029719			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029719			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029719			127-18-4	Tetrachloroethene	NGS	110	<1.6	45	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029719			108-88-3	Toluene	NGS	100	<1.5	2.0	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-E

Customer Sample ID: 16-08068-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029719			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029719			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029719			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029719			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029719			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029719			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-F

Customer Sample ID: 16-08068-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029720			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029720			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
S16T029720			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029720			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029720			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	<2.0	<2.0	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029720			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
S16T029720			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029720			71-36-3	1-Butanol	NGS	130	<8.9	56	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029720			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029720			71-23-8	1-Propanol	NGS	120	<3.0	78	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029720			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
S16T029720			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029720			78-93-3	2-Butanone	NGS	95	<1.9	2.5	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029720			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029720			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029720			78-94-4	3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029720			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029720			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029720			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029720			67-64-1	Acetone	NGS	87	<4.3	250	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T029720			75-05-8	Acetonitrile	NGS	88	14	1.1E+03	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029720			98-86-2	Acetophenone	NGS	94	<2.6	9.9	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029720			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029720			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
 SDG Number:
 Customer Sample ID: 16-08068-2-EFF-F
 Customer Sample ID: 16-08068-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029720			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029720			71-43-2	Benzene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029720			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029720			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029720			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029720			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			75-00-3	Chloroethane	NGS	100	<1.9	7.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029720			67-86-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029720			124-18-5	Decane	NGS	94	<2.8	5.6	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029720			64-17-5	Ethanol	NGS	110	<7.4	280	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029720			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029720			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			75-09-2	Methylene Chloride	NGS	98	3.9	2.8	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T029720			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029720			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029720			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			107-12-0	Propanenitrile	NGS	98	<1.4	4.0	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029720			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029720			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029720			127-18-4	Tetrachloroethene	NGS	110	<1.6	30	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029720			108-88-3	Toluene	NGS	100	<1.5	1.5	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-F
Customer Sample ID: 16-08068-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029720			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029720			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	33	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029720			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029720			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029720			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029720			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-G
Customer Sample ID: 16-08068-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029721			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029721			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
S16T029721			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029721			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029721			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			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
S16T029721			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
S16T029721			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029721			71-36-3	1-Butanol	NGS	130	<8.9	80	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029721			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029721			71-23-8	1-Propanol	NGS	120	<3.0	96	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029721			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
S16T029721			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029721			78-93-3	2-Butanone	NGS	95	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029721			110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029721			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029721			78-94-4	3-Buten-2-one	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029721			106-35-4	3-Heptanone	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029721			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029721			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029721			67-64-1	Acetone	NGS	87	<4.3	700	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029721			75-05-8	Acetonitrile	NGS	88	14	1.2E+03	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029721			98-96-2	Acetophenone	NGS	94	<2.6	6.0	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029721			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029721			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-G

Customer Sample ID: 16-08068-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029721			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029721			71-43-2	Benzene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029721			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029721			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029721			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029721			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			75-00-3	Chloroethane	NGS	100	<1.9	6.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029721			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			110-82-7	Cyclohexane	NGS	100	<1.8	3.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T029721			124-18-5	Decane	NGS	94	<2.8	17	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029721			64-17-5	Ethanol	NGS	110	<7.4	410	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029721			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			100-41-4	Ethylbenzene	NGS	100	<1.5	1.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029721			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029721			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			75-09-2	Methylene Chloride	NGS	98	3.9	3.3	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T029721			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029721			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029721			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029721			107-12-0	Propanenitrile	NGS	98	<1.4	11	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029721			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029721			100-42-5	Styrene	NGS	100	<1.6	5.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029721			127-18-4	Tetrachloroethene	NGS	110	<1.6	22	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029721			108-88-3	Toluene	NGS	100	<1.5	4.2	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-G
Customer Sample ID: 16-08068-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029721			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029721			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	120	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029721			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029721			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029721			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029721			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-H
Customer Sample ID: 16-08068-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029722			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029722			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
S16T029722			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029722			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029722			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.6	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029722			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
S16T029722			123-91-1	1,4-Dioxane	NGS	100	<1.7	2.0	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029722			71-36-3	1-Butanol	NGS	130	<8.9	420	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029722			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029722			71-23-8	1-Propanol	NGS	120	<3.0	240	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029722			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
S16T029722			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029722			78-93-3	2-Butanone	NGS	95	<1.9	230	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029722			110-43-0	2-Heptanone	NGS	96	<1.6	34	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			591-78-6	2-Hexanone	NGS	95	<1.2	27	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029722			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029722			78-94-4	3-Buten-2-one	NGS	89	<1.7	13	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029722			106-35-4	3-Heptanone	NGS	95	<1.5	210	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029722			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029722			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	2.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029722			67-84-1	Acetone	NGS	87	<4.3	3.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029722			75-05-8	Acetonitrile	NGS	88	14	840	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029722			98-86-2	Acetophenone	NGS	94	<2.6	7.8	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029722			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029722			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-EFF-H
Customer Sample ID: 16-08068-2-EFF-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															
S16T029722			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029722			71-43-2	Benzene	NGS	100	<1.2	6.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029722			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029722			123-72-8	Butanal	NGS	110	<2.1	19	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029722			109-74-0	Butanenitrile	NGS	98	<1.2	27	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029722			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			75-00-3	Chloroethane	NGS	100	<1.9	4.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029722			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029722			124-18-5	Decane	NGS	94	<2.8	2.9	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T029722			64-17-5	Ethanol	NGS	110	<7.4	340	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029722			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029722			628-73-9	Hexanenitrile	NGS	99	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029722			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			75-09-2	Methylene Chloride	NGS	98	3.9	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029722			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029722			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029722			110-59-8	Pentanitrile	NGS	96	<1.6	6.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029722			107-12-0	Propanenitrile	NGS	98	<1.4	49	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029722			110-86-1	Pyridine	NGS	130	<3.8	13	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029722			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029722			127-18-4	Tetrachloroethene	NGS	110	<1.6	7.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029722			108-88-3	Toluene	NGS	100	<1.5	5.1	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-H

Customer Sample ID: 16-08068-2-EFF-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															
S16T029722			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029722			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029722			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029722			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029722			142-82-5	n-Heptane	NGS	96	<1.4	8.9	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T029722			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-IN-A
Customer Sample ID: 16-08068-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029723			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029723			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
S16T029723			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029723			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029723			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029723			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
S16T029723			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
S16T029723			123-91-1	1,4-Dioxane	NGS	100	<1.7	3.5	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029723			71-36-3	1-Butanol	NGS	130	<8.9	580	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029723			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029723			71-23-8	1-Propanol	NGS	120	<3.0	310	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029723			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
S16T029723			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029723			78-93-3	2-Butanone	NGS	95	<1.9	350	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029723			110-43-0	2-Heptanone	NGS	96	<1.6	61	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029723			591-78-6	2-Hexanone	NGS	95	<1.2	25	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029723			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029723			78-94-4	3-Buten-2-one	NGS	89	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029723			106-35-4	3-Heptanone	NGS	95	<1.5	350	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029723			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029723			108-10-1	4-Methyl-2-pentanone	NGS	98	<1.9	3.6	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029723			67-64-1	Acetone	NGS	87	<4.3	4.2E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029723			75-05-8	Acetonitrile	NGS	88	14	880	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029723			98-86-2	Acetophenone	NGS	94	<2.6	33	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029723			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029723			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-IN-A
Customer Sample ID: 16-08068-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029723			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a
S16T029723			71-43-2	Benzene	NGS	100	<1.2	9.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029723			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029723			123-72-8	Butanal	NGS	110	<2.1	16	n/a	n/a	n/a	n/a	2.1	n/a	
S16T029723			109-74-0	Butanenitrile	NGS	98	<1.2	41	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029723			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029723			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			75-00-3	Chloroethane	NGS	100	<1.9	6.3	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029723			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029723			124-18-5	Decane	NGS	94	<2.8	14	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029723			64-17-5	Ethanol	NGS	110	<7.4	420	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029723			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			100-41-4	Ethylbenzene	NGS	100	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T029723			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029723			110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029723			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029723			75-09-2	Methylene Chloride	NGS	98	3.9	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T029723			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029723			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029723			110-59-8	Pentanitrile	NGS	96	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029723			107-12-0	Propanenitrile	NGS	98	<1.4	58	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029723			110-86-1	Pyridine	NGS	130	<3.8	22	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T029723			100-42-5	Styrene	NGS	100	<1.6	2.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029723			127-18-4	Tetrachloroethene	NGS	110	<1.6	32	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029723			108-88-3	Toluene	NGS	100	<1.5	7.8	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-IN-A
Customer Sample ID: 16-08068-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029723			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029723			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	120	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029723			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029723			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029723			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029723			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-IN-H
Customer Sample ID: 16-08068-2-IN-H

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flag
VAPOR-TDU VOA #2															
S16T029730			79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029730			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
S16T029730			75-34-3	1,1-Dichloroethane	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029730			75-35-4	1,1-Dichloroethene	NGS	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029730			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			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
S16T029730			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
S16T029730			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029730			71-36-3	1-Butanol	NGS	130	<8.9	85	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T029730			111-70-6	1-Heptanol	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T029730			71-23-8	1-Propanol	NGS	120	<3.0	95	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T029730			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
S16T029730			1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029730			78-93-3	2-Butanone	NGS	95	<1.9	4.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029730			110-43-0	2-Heptanone	NGS	96	<1.6	3.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T029730			591-78-6	2-Hexanone	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029730			534-22-5	2-Methylfuran	NGS	99	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029730			78-94-4	3-Buten-2-one	NGS	88	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029730			106-35-4	3-Heptanone	NGS	95	<1.5	18	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			106-68-3	3-Octanone	NGS	95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T029730			105-42-0	4-Methyl-2-hexanone	NGS	95	<1.3	1.8	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T029730			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029730			67-64-1	Acetone	NGS	87	<4.3	2.5E+03	n/a	n/a	n/a	n/a	4.3	n/a	E
S16T029730			75-05-8	Acetonitrile	NGS	88	14	2.1E+03	n/a	n/a	n/a	n/a	1.8	n/a	BE
S16T029730			98-86-2	Acetophenone	NGS	94	<2.6	5.2	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T029730			107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T029730			107-18-6	Allyl Alcohol	NGS	110	<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: 20162851
SDG Number:
Customer Sample ID: 16-08068-2-IN-H
Customer Sample ID: 16-08068-2-IN-H

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T029730			107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029730			71-43-2	Benzene	NGS	100	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T029730			100-47-0	Benzonitrile	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T029730			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T029730			109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T029730			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			108-90-7	Chlorobenzene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			75-00-3	Chloroethane	NGS	100	<1.9	6.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T029730			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T029730			124-18-5	Decane	NGS	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T029730			84-17-5	Ethanol	NGS	110	<7.4	610	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T029730			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			110-00-9	Furan	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			110-54-3	Hexane	NGS	97	<1.7	2.6	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T029730			628-73-9	Hexanenitrile	NGS	99	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			126-98-7	Methacrylonitrile	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			75-09-2	Methylene Chloride	NGS	98	3.9	5.0	n/a	n/a	n/a	n/a	2.7	n/a	BU
S16T029730			91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T029730			98-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T029730			110-59-8	Pentanitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			107-12-0	Propanenitrile	NGS	98	<1.4	37	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029730			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T029730			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			127-18-4	Tetrachloroethene	NGS	110	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T029730			108-88-3	Toluene	NGS	100	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-IN-H

Customer Sample ID: 16-08068-2-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															
S16T029730			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T029730			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	320	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029730			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T029730			123-86-4	n-Butyl acetate	NGS	83	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029730			142-82-5	n-Heptane	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T029730			10061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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James J. J.
10/20/19

**Cartridge Evaluation
Data Summary Report**

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-A

Customer Sample ID: 16-08068-2-EFF-A

Sample#	R	Al#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029715				2-Propanol, 2-methyl-	75-65-0	7.15	NGS	27	JNT
S16T029715				Acetic acid	64-19-7	9.58	NGS	43	JNT
S16T029715				Formamide	75-12-7	14.07	NGS	30	JNT
S16T029715				Propanoic acid, 2,2-dimethyl-	75-98-9	16.50	NGS	33	JNT
S16T029715				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	120	JNT
S16T029715				2,2,7,7-Tetramethyloctane	1071-31-4	21.49	NGS	31	JNT
S16T029715				D-Limonene	5989-27-5	22.61	NGS	130	JNT
S16T029715				3-Ethyl-3-methylheptane	17302-01-1	22.98	NGS	99	JNT
S16T029715				Decane, 2,4,6-trimethyl-	62109-27-4	23.11	NGS	44	JNT
S16T029715				Heptanoic acid, 2-ethyl-	3274-29-1	23.69	NGS	100	JNT
S16T029715				Undecane	1120-21-4	23.83	NGS	71	JNT
S16T029715				Undecane, 5,7-dimethyl-	17312-83-3	23.93	NGS	46	JNT
S16T029715				Unknown-1	-	24.23	NGS	330	JT
S16T029715				Undecane, 3-methyl-	1002-43-3	24.88	NGS	6.5	JNT
S16T029715				Dodecane	112-40-3	25.25	NGS	41	JNT
S16T029715				Methanamine	100-97-0	26.21	NGS	80	JNT
S16T029715				Benzo[h]azolo	95-16-9	26.33	NGS	110	JNT
S16T029715				Dodecane, 4,6-dimethyl-	6114-1728	26.42	NGS	59	JNT
S16T029715				Tridecane	629505	26.57	NGS	15	JNT
S16T029715				Unknown-2	-	26.61	NGS	38	JT
S16T029715				Tetradecane	629-59-4	26.99	NGS	35	JNT

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-B

Customer Sample ID: 16-08068-2-EFF-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029716				2-Propanol, 2-methyl-	75-65-0	7.15	NGS	50	JNT
S16T029716				Acetic acid	64-19-7	9.55	NGS	34	JNT
S16T029716				Formamide	75-12-7	14.09	NGS	50	JNT
S16T029716				Propanoic acid, 2,2-dimethyl-	75-98-9	16.52	NGS	51	JNT
S16T029716				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	140	JNT
S16T029716				D-Limonene	5989-27-5	22.61	NGS	130	JNT
S16T029716				2,6-Dimethyldecane	13150-81-7	22.97	NGS	100	JNT
S16T029716				Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	39	JNT
S16T029716				Heptanoic acid, 2-ethyl-	3274-29-1	23.68	NGS	120	JNT
S16T029716				Undecane	1120-21-4	23.83	NGS	83	JNT
S16T029716				Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	72	JNT
S16T029716				Unknown-1	-	24.22	NGS	320	JT
S16T029716				Undecane, 3-methyl	1002433	24.88	NGS	11	JNT
S16T029716				Dodecane	112-40-3	25.25	NGS	50	JNT
S16T029716				2-Propanoic acid, octyl ester	2499-59-4	25.40	NGS	29	JNT
S16T029716				Unknown-2	-	26.00	NGS	46	JT
S16T029716				Ethylene diacrylate	2274-11-5	26.03	NGS	26	JNT
S16T029716				Benzothiazole	95-16-9	26.34	NGS	140	JNT
S16T029716				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	64	JNT
S16T029716				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.55	NGS	20	JNT
S16T029716				Tridecane	629505	26.58	NGS	17	JNT
S16T029716				1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.63	NGS	34	JNT
S16T029716				Tetradecane	629594	27.01	NGS	36	JNT

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-C

Customer Sample ID: 16-08068-2-EFF-C

Sample#	R	Al#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029717				2-Propanol, 2-methyl-	75-65-0	7.14	NGS	50	JNT
S16T029717				Acetic acid	64-19-7	9.44	NGS	19	JNT
S16T029717				Formamide	75-12-7	14.08	NGS	62	JNT
S16T029717				Propanoic acid, 2,2-dimethyl-	75-98-9	16.51	NGS	44	JNT
S16T029717				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	130	JNT
S16T029717				D-Limonene	5989-27-5	22.61	NGS	120	JNT
S16T029717				3-Ethyl-3-methylheptane	17302-01-1	22.97	NGS	93	JNT
S16T029717				Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	34	JNT
S16T029717				Hexanoic acid, 2-ethyl-	149-57-5	23.68	NGS	98	JNT
S16T029717				Undecane	1120-21-4	23.83	NGS	74	JNT
S16T029717				Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	63	JNT
S16T029717				Undecane, 2-methyl-	7045718	24.04	NGS	19	JNT
S16T029717				Unknown-1	-	24.22	NGS	340	JT
S16T029717				Undecane, 3-methyl-	1002433	24.88	NGS	7.8	JNT
S16T029717				Dodecane	112-40-3	25.25	NGS	62	JNT
S16T029717				2-Propanoic acid, octyl ester	2499-59-4	25.99	NGS	30	JNT
S16T029717				Benzothiazole	95-16-9	26.33	NGS	150	JNT
S16T029717				Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	54	JNT
S16T029717				Tridecane	629505	26.57	NGS	31	JNT
S16T029717				1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	38	JNT
S16T029717				Tetradecane	629594	27.00	NGS	30	JNT

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-D

Customer Sample ID: 16-08068-2-EFF-D

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029718				Cyclobutylamine	2516-34-9	5.30	NGS	81	JNT
S16T029718				2-Propanol, 2-methyl-	75-65-0	7.15	NGS	44	JNT
S16T029718				Acetic acid	64-19-7	9.45	NGS	18	JNT
S16T029718				Formamide	75-12-7	14.09	NGS	53	JNT
S16T029718				Propanoic acid, 2,2-dimethyl-	75-98-9	16.51	NGS	39	JNT
S16T029718				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	110	JNT
S16T029718				Cyclohexene, 1-methyl-5-(1-met	1461-27-4	22.61	NGS	120	JNT
S16T029718				2,6-Dimethyldecane	13150-81-7	22.97	NGS	92	JNT
S16T029718				Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	35	JNT
S16T029718				Heptanoic acid, 2-ethyl-	3274-29-1	23.68	NGS	120	JNT
S16T029718				Undecane	1120-21-4	23.83	NGS	80	JNT
S16T029718				Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	61	JNT
S16T029718				Undecane, 2-methyl-	7045718	24.04	NGS	22	JNT
S16T029718				Unknown-1	-	24.22	NGS	280	JT
S16T029718				Undecane, 3-methyl-	1002-43-3	24.88	NGS	6.5	JNT
S16T029718				Dodecane	112-40-3	25.25	NGS	33	JNT
S16T029718				Benzothiazole	95-16-9	26.34	NGS	70	JNT
S16T029718				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	52	JNT
S16T029718				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.55	NGS	31	JNT
S16T029718				Unknown-2	-	26.62	NGS	37	JT
S16T029718				Dodecane, 2,6,10-trimethyl-	3891983	26.74	NGS	8.7	JNT
S16T029718				Tetradecane	629594	27.01	NGS	33	JNT

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-E

Customer Sample ID: 16-08068-2-EFF-E

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029719				Acetic anhydride	108-24-7	5.28	NGS	77	JNT
S16T029719				2-Propanol, 2-methyl-	75-65-0	7.15	NGS	28	JNT
S16T029719				Formamide	75-12-7	14.09	NGS	53	JNT
S16T029719				Cyclotetrasiloxane, octamethyl	556-87-2	20.43	NGS	68	JNT
S16T029719				D-Limonene	5989-27-5	22.61	NGS	81	JNT
S16T029719				2,6-Dimethyldecane	13150-81-7	22.97	NGS	54	JNT
S16T029719				Decane, 2,4,6-trimethyl-	82108-27-4	23.11	NGS	20	JNT
S16T029719				1-Undecene, 4-methyl-	74630-39-0	23.76	NGS	5.9	JNT
S16T029719				Undecane	1120214	23.76	NGS	5.9	JNT
S16T029719				Undecane, 4,7-dimethyl-	17301-32-5	23.83	NGS	41	JNT
S16T029719				Undecane, 5,7-dimethyl-	17312-83-3	23.93	NGS	31	JNT
S16T029719				Undecane, 2-methyl-	7045718	24.04	NGS	11	JNT
S16T029719				Unknown-1	-	24.22	NGS	200	JT
S16T029719				Dodecane	112-40-3	25.25	NGS	29	JNT
S16T029719				Methanamine	100-97-0	26.22	NGS	10	JNT
S16T029719				Benzothiazole	95-16-9	26.33	NGS	110	JNT
S16T029719				Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	42	JNT
S16T029719				Propanoic acid, 2-methyl-, 2,2	74367-33-2	26.57	NGS	39	JNT
S16T029719				Unknown-2	-	26.61	NGS	31	JT
S16T029719				Dodecane, 2,6,10-trimethyl-	3891983	26.73	NGS	8.2	JNT
S16T029719				Tetradecane	629594	27.00	NGS	24	JNT

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-F

Customer Sample ID: 16-08068-2-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029720				Methyl formate	107-31-3	4.72	NGS	43 JNT	
S16T029720				Unknown-1	-	8.28	NGS	49 JT	
S16T029720				Formamide	75-12-7	14.10	NGS	48 JNT	
S16T029720				Cyclotetrasiloxane, octamethyl	556-87-2	20.43	NGS	51 JNT	
S16T029720				D-Limonene	5989-27-5	22.61	NGS	52 JNT	
S16T029720				2,6-Dimethyldecane	13150-81-7	22.97	NGS	40 JNT	
S16T029720				Decane, 2,4,6-trimethyl-	82108-27-4	23.11	NGS	15 JNT	
S16T029720				Hydroxylamine, O-decyl-	29812-79-1	23.71	NGS	33 JNT	
S16T029720				Undecane, 4,6-dimethyl-	17312-82-2	23.82	NGS	40 JNT	
S16T029720				Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	36 JNT	
S16T029720				Undecane, 2-methyl-	7045718	24.04	NGS	14 JNT	
S16T029720				Unknown-2	-	24.22	NGS	190 JT	
S16T029720				Undecane, 3-methyl-	1002433	24.88	NGS	5.8 JNT	
S16T029720				Dodecane	112-40-3	25.25	NGS	34 JNT	
S16T029720				2-Propenoic acid, octyl ester	2499-59-4	25.99	NGS	35 JNT	
S16T029720				Methanamine	100-97-0	26.21	NGS	74 JNT	
S16T029720				Benzothiazole	95-16-9	26.34	NGS	94 JNT	
S16T029720				Dodecane, 4,6-dimethyl-	81141728	26.42	NGS	33 JNT	
S16T029720				Dodecane, 2,6,11-trimethyl-	31295564	26.73	NGS	6.3 JNT	
S16T029720				Tetradecane	629594	27.00	NGS	19 JNT	

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

Y - Comment
B - Blank Contamination

L - LLS Outside Range
E - Outside Calibration Range

U - Less Than Detection Limit
N - Named TIC

Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-G

Customer Sample ID: 16-08068-2-EFF-G

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029721				Methyl formate	107-31-3	4.72	NGS	43	JNT
S16T029721				Unknown-1	-	5.37	NGS	56	JT
S16T029721				Formamide	75-12-7	14.11	NGS	54	JNT
S16T029721				Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	69	JNT
S16T029721				Heptane, 2,4-dimethyl-	2213-23-2	17.28	NGS	110	JNT
S16T029721				Octane, 3-chloro-	1117-79-9	17.67	NGS	28	JNT
S16T029721				Octane, 4-methyl-	2216-34-4	18.09	NGS	56	JNT
S16T029721				Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	260	JNT
S16T029721				1-Hexanol, 2-ethyl-	104-76-7	21.99	NGS	37	JNT
S16T029721				D-Limonene	5989-27-5	22.61	NGS	98	JNT
S16T029721				Octane, 2,3,6,7-tetramethyl-	52670-34-5	22.89	NGS	39	JNT
S16T029721				3-Ethyl-3-methylheptane	17302-01-1	22.97	NGS	390	JNT
S16T029721				Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	150	JNT
S16T029721				Decane, 3-methyl-	13151-34-3	23.19	NGS	26	JNT
S16T029721				Cyclooctane, 1,4-dimethyl-, tr	13151-98-9	23.47	NGS	58	JNT
S16T029721				Cyclooctane, 1,4-dimethyl-, ci	13151-99-0	23.55	NGS	33	JNT
S16T029721				Hexanoic acid, 2-ethyl-	149-57-5	23.68	NGS	62	JNT
S16T029721				Undecane	1120-21-4	23.71	NGS	110	JNT
S16T029721				2,3-Dimethyldecane	17312-44-6	23.76	NGS	30	JNT
S16T029721				Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	250	JNT
S16T029721				Undecane, 4,7-dimethyl-	17301-32-5	23.93	NGS	110	JNT
S16T029721				Decane, 3,7-dimethyl-	17312-54-8	24.04	NGS	50	JNT
S16T029721				Unknown-2	-	24.22	NGS	200	JT
S16T029721				Undecane, 3-methyl-	1002-43-3	24.88	NGS	20	JNT
S16T029721				Dodecane	112-40-3	25.25	NGS	53	JNT
S16T029721				Dodecane, 4,6-dimethyl-	6114-1728	26.43	NGS	35	JNT
S16T029721				Dodecane, 2,6,11-trimethyl-	31295564	26.56	NGS	8.5	JNT

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T - Tentatively Identified Compound

Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-G

Customer Sample ID: 16-08068-2-EFF-G

Sample#	R	AI#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029721				Tetradecane	629594	27.02	NGS	16	UNT

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Cartridge Evaluation
Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-EFF-H

Customer Sample ID: 16-08068-2-EFF-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029722				Methyl formate	107-31-3	4.72	NGS	64 JNT	
S16T029722				4-Methoxy-1-pentene	98386-09-5	7.15	NGS	32 JNT	
S16T029722				Acetic anhydride	108-24-7	7.46	NGS	38 JNT	
S16T029722				Tetrahydrofuran	109-99-9	11.98	NGS	7.8 JNT	
S16T029722				Formamide	75-12-7	14.11	NGS	60 JNT	
S16T029722				2-Pentanone	107-87-9	14.17	NGS	45 JNT	
S16T029722				Neopentane	463-82-1	15.76	NGS	61 JNT	
S16T029722				Cyclotetrasiloxane, octamethyl	556-87-2	20.43	NGS	64 JNT	
S16T029722				D-Limonene	5989-27-5	22.61	NGS	26 JNT	
S16T029722				2,6-Dimethyldecane	13150-81-7	22.97	NGS	25 JNT	
S16T029722				Decane, 2,4,6-trimethyl-	82108-27-4	23.11	NGS	10 JNT	
S16T029722				Undecane, 4,7-dimethyl-	17301-32-5	23.82	NGS	25 JNT	
S16T029722				Unknown-1	-	24.22	NGS	110 JT	
S16T029722				Dodecane	112403	25.25	NGS	15 JNT	
S16T029722				Unknown-2	-	25.86	NGS	26 JT	
S16T029722				Methanamine	100-97-0	26.21	NGS	130 JNT	
S16T029722				Benzothiazole	95-16-9	26.33	NGS	49 JNT	
S16T029722				Dodecane, 4,6-dimethyl-	81141728	26.42	NGS	14 JNT	
S16T029722				Tetradecane	629594	27.00	NGS	8.6 JNT	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-IN-A

Customer Sample ID: 16-08068-2-IN-A

Sample#	R	AI#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029723				Methyl formate	107-31-3	4.72	NGS	71	JNT
S16T029723				2-Propanol, 2-methyl-	75-65-0	7.16	NGS	100	JNT
S16T029723				Methyl Acetate	79-20-9	7.46	NGS	41	JNT
S16T029723				Acetic acid	64-19-7	9.65	NGS	40	JNT
S16T029723				Tetrahydrofuran	109-99-9	11.98	NGS	9.3	JNT
S16T029723				2-Pentanone	107-87-9	14.17	NGS	150	JNT
S16T029723				Cyclopentanol	96-41-3	14.40	NGS	35	JNT
S16T029723				Neopentane	463-82-1	15.76	NGS	77	JNT
S16T029723				Propanoic acid, 2,2-dimethyl-	75-98-9	16.54	NGS	55	JNT
S16T029723				Cyclohexane, hexamethyl-	541-05-9	17.02	NGS	62	JNT
S16T029723				4-Heptanone	123-19-3	18.32	NGS	30	JNT
S16T029723				Cyclohexylsiloxane, octamethyl	556-67-2	20.43	NGS	190	JNT
S16T029723				2,2,7,7-Tetramethyloctane	1071-31-4	21.49	NGS	34	JNT
S16T029723				1-Hexanol, 2-ethyl-	104-76-7	21.99	NGS	31	JNT
S16T029723				D-Limonene	5989-27-5	22.61	NGS	110	JNT
S16T029723				3-Ethyl-3-methylheptane	17302-01-1	22.97	NGS	100	JNT
S16T029723				Decane, 2,4,6-trimethyl-	82108-27-4	23.11	NGS	46	JNT
S16T029723				Hexanoic acid, 2-ethyl-	149-57-5	23.69	NGS	110	JNT
S16T029723				Undecane, 4,7-dimethyl-	17301-32-5	23.82	NGS	94	JNT
S16T029723				Undecane, 5,7-dimethyl-	17312-83-3	23.91	NGS	60	JNT
S16T029723				Unknown-1	-	24.22	NGS	270	JT
S16T029723				Undecane, 3-methyl-	1002433	24.88	NGS	7.4	JNT
S16T029723				Dodecane	112-40-3	25.25	NGS	35	JNT
S16T029723				Ethanol, 2-phenoxy-	122-99-6	25.82	NGS	36	JNT
S16T029723				Methanamine	100-97-0	26.22	NGS	60	JNT
S16T029723				Benzothiazole	95-16-9	26.34	NGS	47	JNT
S16T029723				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	35	JNT

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U - Less Than Detection Limit

N - Named TIC

L - ILS Outside Range

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Y - Comment

B - Blank Contamination

J - Estimated

T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-IN-A

Customer Sample ID: 16-08068-2-IN-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029723				1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	28 JNT	
S16T029723				Tetradecane	529594	27.01	NGS	18 JNT	

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162851

SDG Number:

Customer Sample ID: 16-08068-2-IN-H

Customer Sample ID: 16-08068-2-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T029730				Methyl formate	107-31-3	4.72	NGS	48	JNT
S16T029730				Formamide	75-12-7	14.10	NGS	54	JNT
S16T029730				D-Limonene	5989-27-5	22.61	NGS	31	JNT
S16T029730				Decane, 2,4,6-trimethyl-	82108-27-4	22.97	NGS	8.7	JNT
S16T029730				Undecane	1120-21-4	23.82	NGS	8.6	JNT
S16T029730				Unknown-1	-	24.22	NGS	79	JT
S16T029730				Dodecane	112403	25.25	NGS	6.4	JNT
S16T029730				Unknown-2	-	25.87	NGS	38	JT
S16T029730				Methienamine	100-97-0	26.22	NGS	140	JNT
S16T029730				Dodecane, 4,6-dimethyl-	81141728	26.43	NGS	16	JNT
S16T029730				Tetradecane	829505	27.02	NGS	9.0	JNT

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L - ILS Outside Range
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U - Less Than Detection Limit
N - Named TIC

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John D. Jones
10/6/14

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-BASE-EFF

Customer Sample ID: 16-07837-3-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029769			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029769			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029769			825-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029769			3771-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029769			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029769			3777-89-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029769			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029769			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029769			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-BASE-IN
Customer Sample ID: 16-07837-3-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029770			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029770			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029770			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029770			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029770			534-22-5	2-Methylfuran	NGS	86	<0.46	0.48	n/a	n/a	n/a	n/a	0.46	n/a	J
S16T029770			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029770			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029770			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029770			109-98-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

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Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-BLANK1

Customer Sample ID: 16-07837-3-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029771			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029771			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029771			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029771			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029771			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029771			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029771			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029771			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029771			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-BLANK2
Customer Sample ID: 16-07837-3-BLANK2

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															
S16T029772			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T029772			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T029772			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T029772			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T029772			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T029772			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T029772			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T029772			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T029772			109-99-8	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-EFF-A
Customer Sample ID: 16-07837-3-EFF-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															
S16T029773			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T029773			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T029773			625-96-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T029773			3777-71-7	2-Hepylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T029773			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T029773			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T029773			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T029773			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T029773			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-EFF-B

Customer Sample ID: 16-07837-3-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029774			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029774			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.41	n/a	n/a	n/a	n/a	0.33	n/a	J
S16T029774			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029774			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029774			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029774			3777-69-3	2-Pentylfuran	NGS	120	<0.90	0.98	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029774			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029774			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029774			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-EFF-C
Customer Sample ID: 16-07837-3-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															
S16T029775			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029775			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.43	n/a	n/a	n/a	n/a	0.33	n/a	J
S16T029775			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029775			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029775			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029775			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029775			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029775			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029775			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-EFF-D

Customer Sample ID: 16-07837-3-EFF-D

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															
S16T029776			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029776			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.37	n/a	n/a	n/a	n/a	0.33	n/a	J
S16T029776			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029776			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029776			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029776			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029776			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029776			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029776			109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-EFF-E

Customer Sample ID: 16-07837-3-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029777			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029777			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029777			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029777			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029777			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029777			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029777			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029777			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029777			109-98-9	Tetrahydrofuran	NGS	88	<0.23	0.25	n/a	n/a	n/a	n/a	0.23	n/a	J

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-EFF-F

Customer Sample ID: 16-07837-3-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029778			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029778			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029778			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029778			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029778			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029778			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029778			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029778			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029778			109-98-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-EFF-H

Customer Sample ID: 16-07837-3-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029780			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029780			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029780			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029780			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029780			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029780			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029780			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029780			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029780			109-98-9	Tetrahydrofuran	NGS	88	<0.23	1.1	n/a	n/a	n/a	n/a	0.23	n/a	J

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-A
Customer Sample ID: 16-07837-3-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029781			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.1	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029781			1708-28-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029781			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029781			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029781			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029781			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029781			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029781			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029781			109-99-9	Tetrahydrofuran	NGS	88	<0.23	8.6	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749

SDG Number:

Customer Sample ID: 16-07837-3-IN-B

Customer Sample ID: 16-07837-3-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															
S16T029782			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.3	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029782			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029782			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029782			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029782			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029782			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029782			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029782			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029782			109-99-9	Tetrahydrofuran	NGS	88	<0.23	12	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-C
Customer Sample ID: 16-07837-3-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029783			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.1	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029783			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029783			625-85-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029783			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029783			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029783			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029783			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029783			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029783			109-99-9	Tetrahydrofuran	NGS	88	<0.23	11	n/a	n/a	n/a	n/a	0.23	n/a	

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-D
Customer Sample ID: 16-07837-3-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029784			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	1.6	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029784			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029784			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029784			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029784			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029784			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029784			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029784			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029784			109-99-9	Tetrahydrofuran	NGS	88	<0.23	13	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-E
Customer Sample ID: 16-07837-3-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029785			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	1.7	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029785			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029785			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029785			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029785			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029785			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029785			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029785			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029785			109-99-9	Tetrahydrofuran	NGS	88	<0.23	17	n/a	n/a	n/a	n/a	0.23	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-F
Customer Sample ID: 16-07837-3-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029786			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	0.94	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029786			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029786			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029786			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029786			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029786			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029786			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029786			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029786			109-89-9	Tetrahydrofuran	NGS	88	<0.23	16	n/a	n/a	n/a	n/a	0.23	n/a	

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-G
Customer Sample ID: 16-07837-3-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029787			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	0.60	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029787			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029787			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029787			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029787			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029787			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029787			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029787			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029787			109-99-9	Tetrahydrofuran	NGS	88	<0.23	21	n/a	n/a	n/a	n/a	0.23	n/a	

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary of All Results

Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-IN-H
Customer Sample ID: 16-07837-3-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029788			1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	0.41	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029788			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029788			625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029788			3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029788			534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029788			3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029788			4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029788			110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029788			109-99-9	Tetrahydrofuran	NGS	88	<0.23	15	n/a	n/a	n/a	n/a	0.23	n/a	

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Signature
 11/21/16

Cartridge Evaluation
 Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-BASE-EFF

Customer Sample ID: 16-08068-3-BASE-EFF

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															
S16T029789			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029789			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029789			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029789			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029789			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029789			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029789			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029789			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029789			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-BASE-IN

Customer Sample ID: 16-08068-3-BASE-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															
S16T029790			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T029790			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T029790			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T029790			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T029790			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T029790			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T029790			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T029790			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T029790			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750
SDG Number:
Customer Sample ID: 16-08068-3-BLANK-EFF
Customer Sample ID: 16-08068-3-BLANK-EFF

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029791			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029791			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029791			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029791			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029791			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029791			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029791			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029791			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029791			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-BLANK-IN

Customer Sample ID: 16-08068-3-BLANK-IN

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															
S16T029792			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029792			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029792			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029792			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029792			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029792			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029792			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029792			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029792			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-EFF-A

Customer Sample ID: 16-08068-3-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															
S16T029793			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029793			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029793			625-96-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029793			3777-71-7	2-Heptylfuran	NGS	110	<0.86	1.1	n/a	n/a	n/a	n/a	0.86	n/a	J
S16T029793			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029793			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.0	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029793			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029793			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029793			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750
SDG Number:
Customer Sample ID: 16-08068-3-EFF-B
Customer Sample ID: 16-08068-3-EFF-B

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029794			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029794			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029794			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029794			3777-71-7	2-Heptylfuran	NGS	110	<0.86	0.87	n/a	n/a	n/a	n/a	0.86	n/a	J
S16T029794			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029794			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029794			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029794			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029794			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-EFF-C

Customer Sample ID: 16-08068-3-EFF-C

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															
S16T029795			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029795			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	0.66	n/a	n/a	n/a	n/a	0.33	n/a	J
S16T029795			625-95-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029795			3777-71-7	2-Hepylfuran	NGS	110	<0.86	1.1	n/a	n/a	n/a	n/a	0.86	n/a	J
S16T029795			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029795			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.5	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029795			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029795			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029795			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-EFF-D

Customer Sample ID: 16-08068-3-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															
S16T029796			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	0.55	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029796			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	0.68	n/a	n/a	n/a	n/a	0.33	n/a	J
S16T029796			825-98-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029796			3777-71-7	2-Hepylfuran	NGS	110	<0.86	1.1	n/a	n/a	n/a	n/a	0.86	n/a	J
S16T029796			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029796			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.3	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029796			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029796			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029796			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750
SDG Number:
Customer Sample ID: 16-08068-3-EFF-E
Customer Sample ID: 16-08068-3-EFF-E

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															
S16T029797			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029797			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029797			825-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029797			3777-71-7	2-Hepylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029797			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029797			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029797			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029797			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029797			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-EFF-F

Customer Sample ID: 16-08068-3-EFF-F

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															
S16T029798			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U
S16T029798			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		n/a U
S16T029798			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		n/a U
S16T029798			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		n/a U
S16T029798			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		n/a U
S16T029798			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		n/a U
S16T029798			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		n/a U
S16T029798			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		n/a U
S16T029798			109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		n/a U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750
SDG Number:
Customer Sample ID: 16-08068-3-EFF-G
Customer Sample ID: 16-08068-3-EFF-G

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															
S16T029799			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029799			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029799			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029799			3777-71-7	2-Heptylfuran	NGS	110	<0.86	0.87	n/a	n/a	n/a	n/a	0.86	n/a	J
S16T029799			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029799			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.2	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029799			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029799			110-00-9	Furan	NGS	68	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029799			109-99-8	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-EFF-H

Customer Sample ID: 16-08068-3-EFF-H

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															
S16T029800			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	1.9	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029800			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029800			825-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029800			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029800			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029800			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029800			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029800			110-00-9	Furan	NGS	68	<0.37	1.1	n/a	n/a	n/a	n/a	0.37	n/a	J
S16T029800			109-99-9	Tetrahydrofuran	NGS	92	<0.23	13	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-A

Customer Sample ID: 16-08068-3-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029801			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	3.2	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029801			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029801			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029801			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029801			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029801			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.2	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029801			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029801			110-00-9	Furan	NGS	68	<0.37	1.5	n/a	n/a	n/a	n/a	0.37	n/a	J
S16T029801			109-99-9	Tetrahydrofuran	NGS	92	<0.23	9.2	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-B

Customer Sample ID: 16-08068-3-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															
S16T029802			1191-99-7	2,3-Dihydrofuran	NGS	77	<0.23	4.9	n/a	n/a	n/a	n/a	0.23	n/a	
S16T029802			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029802			625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029802			3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029802			534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029802			3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.4	n/a	n/a	n/a	n/a	0.90	n/a	J
S16T029802			4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029802			110-00-9	Furan	NGS	68	<0.37	1.6	n/a	n/a	n/a	n/a	0.37	n/a	J
S16T029802			109-99-9	Tetrahydrofuran	NGS	92	<0.23	8.9	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-D

Customer Sample ID: 16-08068-3-IN-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															
S16T029804			1191-89-7	2,3-Dihydrofuran	NGS	75	<0.23	1.2	n/a	n/a	n/a	n/a	0.23	n/a	Q
S16T029804			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	Q
S16T029804			625-86-5	2,5-Dimethylfuran	NGS	89	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	Q
S16T029804			3777-71-7	2-Heptylfuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029804			534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	Q
S16T029804			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029804			4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029804			110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	Q
S16T029804			109-99-9	Tetrahydrofuran	NGS	92	<0.23	9.4	n/a	n/a	n/a	n/a	0.23	n/a	Q

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-E

Customer Sample ID: 16-08068-3-IN-E

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															
S16T029805			1191-99-7	2,3-Dihydrofuran	NGS	75	<0.23	1.9	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029805			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029805			825-86-5	2,5-Dimethylfuran	NGS	89	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029805			3777-71-7	2-Hepylfuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029805			534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029805			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029805			4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029805			110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029805			109-99-9	Tetrahydrofuran	NGS	92	<0.23	14	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-F

Customer Sample ID: 16-08068-3-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T029806			1191-99-7	2,3-Dihydrofuran	NGS	75	<0.23	1.8	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029806			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029806			625-86-5	2,5-Dimethylfuran	NGS	89	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029806			3777-71-7	2-Heptylfuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029806			534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029806			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029806			4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029806			110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029806			109-99-9	Tetrahydrofuran	NGS	92	<0.23	14	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-G

Customer Sample ID: 16-08068-3-IN-G

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															
S16T029807			1191-89-7	2,3-Dihydrofuran	NGS	75	<0.23	1.8	n/a	n/a	n/a	n/a	0.23	n/a	J
S16T029807			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029807			625-86-5	2,5-Dimethylfuran	NGS	89	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029807			3777-71-7	2-Heptylfuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029807			534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029807			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029807			4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029807			110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029807			109-99-9	Tetrahydrofuran	NGS	92	<0.23	17	n/a	n/a	n/a	n/a	0.23	n/a	

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

Customer Sample ID: 16-08068-3-IN-H

Customer Sample ID: 16-08068-3-IN-H

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															
S16T029808			1191-99-7	2,3-Dihydrofuran	NGS	75	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	U
S16T029808			1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a	U
S16T029808			625-86-5	2,5-Dimethylfuran	NGS	89	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	U
S16T029808			3777-71-7	2-Heptylfuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a	U
S16T029808			534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a	U
S16T029808			3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a	U
S16T029808			4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	U
S16T029808			110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	U
S16T029808			109-99-9	Tetrahydrofuran	NGS	92	<0.23	0.56	n/a	n/a	n/a	n/a	0.23	n/a	J

Q - Qualitative

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

C.3.4 Amines



ANALYTICAL REPORT

Report Date: September 20, 2016

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20162741

Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029631		Collected: 09/10/2016		
Lab ID: 1625968001		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m ³)	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: S16T029632		Collected: 09/10/2016		
Lab ID: 1625968002		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029633		Collected: 09/10/2016		
Lab ID: 1625968003		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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ANALYTICAL REPORT

Workorder: **34-1625968**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029634		Collected: 09/10/2016		
Lab ID: 1625968004		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029635		Collected: 09/10/2016		
Lab ID: 1625968005		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029636		Collected: 09/10/2016		
Lab ID: 1625968006		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029637		Collected: 09/10/2016		
Lab ID: 1625968007		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625968**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029638		Collected: 09/10/2016		
Lab ID: 1625968008		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029639		Collected: 09/10/2016		
Lab ID: 1625968009		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029640		Collected: 09/10/2016		
Lab ID: 1625968010		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029641		Collected: 09/10/2016		
Lab ID: 1625968011	Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 09/19/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625968**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029642		Collected: 09/10/2016		
Lab ID: 1625968012		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.32	NA	NA	0.10

Sample ID: S16T029643		Collected: 09/10/2016		
Lab ID: 1625968013		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.11	NA	NA	0.10

Sample ID: S16T029644		Collected: 09/10/2016		
Lab ID: 1625968014		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.43	NA	NA	0.10

Sample ID: S16T029645		Collected: 09/10/2016		
Lab ID: 1625968015		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.46	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029646		Collected: 09/10/2016		
Lab ID: 1625968016		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.38	NA	NA	0.10

Sample ID: S16T029647		Collected: 09/10/2016		
Lab ID: 1625968017		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029648		Collected: 09/10/2016		
Lab ID: 1625968018		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/19/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.13	NA	NA	0.10

Sample ID: S16T029649		Collected: 09/10/2016		
Lab ID: 1625968019		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625968**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029650		Collected: 09/10/2016		
Lab ID: 1625968020		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/19/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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 09/20/2016 10:33	/S/ Thomas Bosch 09/20/2016 11:19

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1625968**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/insideDNR/RegulatoryWater.aspx
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qalab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625968

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH Aliphatic Amines
Batch: ILC/12667 (HBN: 176885)
Analyzed By: Christopher Winter

Blank

LMB: 518831 Analyzed: 09/19/2016 00:00 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: 518832 Analyzed: 09/19/2016 00:00 Dilution: 1 Units: ug/sample					LCSD: 518833 Analyzed: 09/19/2016 00:00 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Dimethylamine	4.07	4.00	102	60.4 134.6	4.03	101	0.987	0.0 20.0	
Ethylamine	4.42	4.00	110	40.0 160.0	4.42	111	0.0679	0.0 20.0	
Methylamine	4.29	4.00	107	40.0 160.0	4.28	107	0.420	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 09/20/2016 10:33	/S/ Thomas Bosch 09/20/2016 11:19

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



ANALYTICAL REPORT

Report Date: September 21, 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

Workorder: **34-1625969**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029611		Collected: 09/10/2016		
Lab ID: 1625969001		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029612		Collected: 09/10/2016		
Lab ID: 1625969002		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029613		Collected: 09/10/2016		
Lab ID: 1625969003		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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ANALYTICAL REPORT

Workorder: 34-1625969

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029614		Collected: 09/10/2016		
Lab ID: 1625969004		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029615		Collected: 09/10/2016		
Lab ID: 1625969005		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029616		Collected: 09/10/2016		
Lab ID: 1625969006		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029617		Collected: 09/10/2016		
Lab ID: 1625969007		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625969**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029618		Collected: 09/10/2016		
Lab ID: 1625969008		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029619		Collected: 09/10/2016		
Lab ID: 1625969009		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029620		Collected: 09/10/2016		
Lab ID: 1625969010		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029621		Collected: 09/10/2016		
Lab ID: 1625969011		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: 34-1625969

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029622		Collected: 09/10/2016		
Lab ID: 1625969012		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029623		Collected: 09/10/2016		
Lab ID: 1625969013		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029624		Collected: 09/10/2016		
Lab ID: 1625969014		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029625		Collected: 09/10/2016		
Lab ID: 1625969015		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625969**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029626		Collected: 09/10/2016		
Lab ID: 1625969016		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029627		Collected: 09/10/2016		
Lab ID: 1625969017		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029628		Collected: 09/10/2016		
Lab ID: 1625969018		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029629		Collected: 09/10/2016		
Lab ID: 1625969019		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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: **34-1625969**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029630		Collected: 09/10/2016		
Lab ID: 1625969020		Received: 09/15/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/20/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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 09/21/2016 11:59	/S/ Thomas Bosch 09/21/2016 12:53

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alst.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: **34-1625969**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing; CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625969

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH Aliphatic Amines
Batch: ILC/12671 (HBN: 176915)
Analyzed By: Christopher Winter

Blank

LMB: 518903 Analyzed: 09/20/2016 00:00 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: 518904 Analyzed: 09/20/2016 00:00 Dilution: 1 Units: ug/sample					LCSD: 518905 Analyzed: 09/20/2016 00:00 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Dimethylamine	4.05	4.00	101	60.4 134.6	4.01	100	0.992	0.0 20.0	
Ethylamine	4.63	4.00	116	40.0 160.0	4.57	114	1.28	0.0 20.0	
Methylamine	4.29	4.00	107	40.0 160.0	4.20	105	1.98	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 09/21/2016 11:59	/S/ Thomas Bosch 09/21/2016 12:53

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



1625969

Assembler N/A		<div style="text-align: right;">1625969</div> <div style="text-align: center;">CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST</div>				C.O.C. No. 20162740 Page 1 of 2	
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN 26-05		FAX 372-1878	
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 2020627020		Ice Chest No. 625-033		Temp. 00 ICE	
Project Title CARTRIDGE EVALUATION	Logbook/ Work Package No. N/A	Bill of Lading/Air Bill No. 7772 2770 4728		Parts and Return No. 41310			
Shipped To (Lab) ALS	Method of Shipment	Data Turnaround 10 DAYS					
Protocol N/A							

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T029611	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-BASE-EFF	N/A
	S16T029612	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-BASE-IN	N/A
	S16T029613	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-BLANK1	N/A
	S16T029614	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-BLANK2	N/A
	S16T029615	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-A	N/A
	S16T029616	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-B	N/A
	S16T029617	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-C	N/A
	S16T029618	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-D	N/A
	S16T029619	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-E	N/A
	S16T029620	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-F	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
 Send Results to Carl Howard IV & Greg Moore
 Carl W. Howard@rl.gov and Greg_S_Moore@rl.gov
 see SW for email
 CONTRACT 55502
 RELEASE 9

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
Sharon L. Holben	Sharon L. Holben	9/14/16	0900	WRPS	Julie Pacheco	9/14/16	0900	DL = Drum Liquids T = Tissue W = Wipe L = Liquid V = Vegetation VA = Vapor A = Air X = Other
Relinquished By	WRPS	Julie Pacheco	9/14/16	1400	FEDEX			
Relinquished By	Calve			Received By	WRPS	9/14/16	1400	
Relinquished By				Received By				

Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Disposed By	Date/Time
	Continued	9/14/16 14:45

FINAL SAMPLE DISPOSITION

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

Assembler		C.O.C. No. 20162740	
N/A		Page 2 of 2	
Collector	JONES	Contact/Requestor	CARL HOWARD IV
SAF No.	N/A	Sample Origin	202062/GB20
Project Title	CARTIDGE EVALUATION	Logbook/ Work Package No.	N/A
Shipped To (Lab)	ALS	Method of Shipment	N/A
Protocol	N/A	Data Turnaround	10 DAYS
Telephone No. 373-6861		MSIN 16-05 FAX 372-1878	
Purchase Order/Charge Code		Ice Chest No. WTS-033	
Bill of Lading/Air Bill No.		Temp. 0W ICE	
Parts and Return No.		91116 7722704728	
41310			

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T029621	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-G	N/A
	S16T029622	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-EFF-H	N/A
	S16T029623	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-A	N/A
	S16T029624	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-B	N/A
	S16T029625	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-C	N/A
	S16T029626	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-D	N/A
	S16T029627	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-E	N/A
	S16T029628	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-F	N/A
	S16T029629	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-G	N/A
	S16T029630	VA	9/10/16	XAD-7-NBD	AMINES 16-07837-4-IN-H	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
 Send Results to Carl Howard IV & Greg Moore
 Carl W. Howard@rl.gov and Greg S. Moore@rl.gov
 see SON for email
 CONTRACT 55502
 RELEASE 9

Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
Sharon L. Howard			9/14/16 0900	JA Gradisher			9/14/16 0900	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids
Relinquished By	JA Gradisher			WRPS	Julie Swoboda		9/14/16 1400	DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other
Relinquished By	WRPS			Received By	Received By			
Relinquished By	WRPS			Received By	Received By			

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time
	Conserved	9/14/16 14:45

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

C.3.5 Acetonitrile



ANALYTICAL REPORT

Report Date: September 22, 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

20162743

Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 and 9/26/16*

Sample ID: S16T021671		Collected: 09/10/2016		
Lab ID: 1625962001		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021672		Collected: 09/10/2016		
Lab ID: 1625962002		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

9/24/16					
Sample ID: S16T021673				Collected: 09/10/2016	
Lab ID: 1625962003		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided					
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

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ANALYTICAL REPORT

Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results 9 out of 9/26/16

Sample ID: S16T02X674		Collected: 09/10/2016		
Lab ID: 1625962004		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T02X675		Collected: 09/10/2016		
Lab ID: 1625962005		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

9 out of 9/26/16				
Sample ID: S16T02X676	Collected: 09/10/2016			
Lab ID: 1625962006	Received: 09/15/2016			
Sampling Location: CARTRIDGE EVALUATION				
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg			
	Analyzed: 09/15/2016			
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T02X677		Collected: 09/10/2016		
Lab ID: 1625962007		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T02X678		Collected: 09/10/2016		
Lab ID: 1625962008		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/15/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1625962**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 and 9/20/16*

Sample ID: S16T021679	Collected: 09/10/2016
Lab ID: 1625962009	Received: 09/15/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (mg/sample) Result (mg/m ³) Result (ppm) RL (mg/sample)
Acetonitrile	<0.010 NA NA 0.010

Sample ID: S16T021680	Collected: 09/10/2016
Lab ID: 1625962010	Received: 09/15/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (mg/sample) Result (mg/m ³) Result (ppm) RL (mg/sample)
Acetonitrile	0.013 NA NA 0.010

Sample ID: S16T021681	Collected: 09/10/2016
Lab ID: 1625962011	Received: 09/15/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (mg/sample) Result (mg/m ³) Result (ppm) RL (mg/sample)
Acetonitrile	<0.010 NA NA 0.010

Sample ID: S16T021682	Collected: 09/10/2016
Lab ID: 1625962012	Received: 09/15/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (mg/sample) Result (mg/m ³) Result (ppm) RL (mg/sample)
Acetonitrile	<0.010 NA NA 0.010

Sample ID: S16T021683	Collected: 09/10/2016
Lab ID: 1625962013	Received: 09/15/2016
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (mg/sample) Result (mg/m ³) Result (ppm) RL (mg/sample)
Acetonitrile	<0.010 NA NA 0.010



ANALYTICAL REPORT

Workorder: **34-1625962**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 cont 9/26/16*

Sample ID: S16T02X684		Collected: 09/10/2016	
Lab ID: 1625962014		Received: 09/15/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
		Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

9 cont 9/26/16				
Sample ID: S16T02X685		Collected: 09/10/2016		
Lab ID: 1625962015		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/15/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

9 with 9/26/16				
Sample ID: S16T02X686		Collected: 09/10/2016		
Lab ID: 1625962016		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/15/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T02X687		Collected: 09/10/2016	
Lab ID: 1625962017		Received: 09/15/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	
		Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

9 curd 9/26/16				
Sample ID: S16T02X688		Collected: 09/10/2016		
Lab ID: 1625962018		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/15/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1625962**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 with 9/26/16*

Sample ID: S16T027689		Collected: 09/10/2016		
Lab ID: 1625962019		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube		
		400/200mg		
		Analyzed: 09/15/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T027690		Collected: 09/10/2016		
Lab ID: 1625962020		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube		
		400/200mg		
		Analyzed: 09/15/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	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 09/22/2016 11:23	/S/ Steven J. Sagers 09/22/2016 12:03

Laboratory Contact Information

ALS Environmental
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ANALYTICAL REPORT

Workorder: **34-1625962**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimpl/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625962

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH GC-FID QC
Batch: IFID/7758 (HBN: 176711)
Analyzed By: Young Hee Yoon

Blank

MB: 518329 Analyzed: 09/15/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

MB: 518332 Analyzed: 09/15/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 518330 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 518331 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.307	0.312	98.4	86.6 115.3	0.313	100	1.94	0.0 20.0	

LCS: 518333 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 518334 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.259	0.250	104	86.6 115.3	0.244	97.8	5.96	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 09/22/2016 11:23	/S/ Steven J. Sagers 09/22/2016 12:03

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



1625962

10/11/16
10/11/16

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A	C.O.C. No. 201627243 Page 1 of 2								
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 313-6861 MSN 16-02 FAX 372-1878							
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 201627243							
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Job Sheet No. 033 Temp. ON ICE							
Shipped To (Lab) ALS	Method of Shipment	Bill of Lading/Air Bill No. 772 2770 4728							
Protocol N/A	Data Turnaround 10 hrs	Parts and Return No. 41310							
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
	S16702671	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BASE-BFF	N/A			
	S16702672	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BASE-IN	N/A			
	S16702673	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BLANK-BFF	N/A			
	S16702674	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BLANK-IN	N/A			
	S16702675	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-A	N/A			
	S16702676	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-B	N/A			
	S16702677	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-C	N/A			
	S16702678	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-D	N/A			
	S16702679	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-E	N/A			
	S16702680	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-BFF-F	N/A			
POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSDS <input checked="" type="radio"/> Yes <input type="radio"/> No Hold Time									
SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Moore Carl N. Howald@rl.gov and Gregory S. Moore@rl.gov for email RELEASE 9 Reference Contract # 55502									
Relinquished By Dianne Turner	Print WRPS	Sign Dianne Turner	Date/Time 9/14/16 8:00	Received By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 0900	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids	Date/Time
Relinquished By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 1400	Received By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 1400	Matrix* DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*	Date/Time
Disposal Method (e.g., Return to customer, per lab procedure, used in process)									
FINAL SAMPLE DISPOSITION									

A-6003-982 (03/05)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										
Assembler N/A	C.O.O. No. 201627743 Page 2 of 2				Telephone No. 373-6861 MSN 16-02 FAX 372-1878					
Collector JONES	Contact/Requestor CARL HOWARD IV				Purchase Order/Charge Code 242837/CAIS					
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION				for Chest No. 7722 2770 4728					
Project Title CARTRIDGE EVALUATION	Logbook/ Work Package No. N/A				Temp. ON ICE					
Shipped To (Lab) AUS	Method of Shipment				Bill of Lading/Air Bill No. 7722 2770 4728					
Protocol N/A	Data Turnaround 10 DAYS				Parts and Return No. 41310					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis					Preservative
16-08068-5-REF-G	S15702681	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-REF-G					N/A
16-08068-5-REF-H	S15702682	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-REF-H					N/A
16-08068-5-IN-A	S15702683	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-A					N/A
16-08068-5-IN-B	S15702684	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-B					N/A
16-08068-5-IN-C	S15702685	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-C					N/A
16-08068-5-IN-D	S15702686	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-D					N/A
16-08068-5-IN-E	S15702687	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-E					N/A
16-08068-5-IN-F	S15702688	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-F					N/A
16-08068-5-IN-G	S15702689	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-G					N/A
16-08068-5-IN-H	S15702690	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-08068-5-IN-H					N/A
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl W. Howald@rl.gov and Gregory.S.Moore@rl.gov For email RELEASE 9 Reference Contract # 55502										
Relinquished By Dianne Turner	Print JA Gradshter	Sign Dianne Turner	Date/Time 9/14/16 0900	Received By WRPS	Print WRPS	Sign Julie Gaden	Date/Time 9/14/16 0900	Matrix* S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid WI = Wipe SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other DS = Drum Solids		
Relinquished By WRPS	Print WRPS	Sign Julie Gaden	Date/Time 9/14/16 0900	Received By FEDEX						
Relinquished By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 0900	Received By WRPS						
Relinquished By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 0900	Received By WRPS						
Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Douglas M. Gm Sept 16, 2016 12:30 PM										
FINAL SAMPLE DISPOSITION All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.										

A-5003-962 (03/05)



ANALYTICAL REPORT

Report Date: September 22, 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

Workorder: **34-1625967**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 and 9/20/16*

Sample ID: S16T021651		Collected: 09/10/2016		
Lab ID: 1625967001		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/15/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021652		Collected: 09/10/2016		
Lab ID: 1625967002		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021653		Collected: 09/10/2016		
Lab ID: 1625967003		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

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: 34-1625967

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results 9 out of 9/26/16

Sample ID: S16T021654		Collected: 09/10/2016		
Lab ID: 1625967004		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021655		Collected: 09/10/2016		
Lab ID: 1625967005		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021656		Collected: 09/10/2016		
Lab ID: 1625967006		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021657		Collected: 09/10/2016		
Lab ID: 1625967007		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021658		Collected: 09/10/2016		
Lab ID: 1625967008		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: 34-1625967

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results 9 cont 9/26/16

Sample ID: S16T021659		Collected: 09/10/2016		
Lab ID: 1625967009		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

9 and 9/26/16			
Sample ID: S16T021660		Collected: 09/10/2016	
Lab ID: 1625967010		Received: 09/15/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) · RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T021661		Collected: 09/10/2016		
Lab ID: 1625967011		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/15/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021662		Collected: 09/10/2016		
Lab ID: 1625967012		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/16/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021663		Collected: 09/10/2016		
Lab ID: 1625967013		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: 34-1625967

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results 9 ~~cont~~ 9/26/16

Sample ID: S16T021664		Collected: 09/10/2016		
Lab ID: 1625967014		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021665		Collected: 09/10/2016		
Lab ID: 1625967015		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/16/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021666		Collected: 09/10/2016		
Lab ID: 1625967016		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021667		Collected: 09/10/2016		
Lab ID: 1625967017		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 09/16/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021668		Collected: 09/10/2016		
Lab ID: 1625967018		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	0.015	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1625967**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results *9 awd 9/26/16*

Sample ID: S16T021669		Collected: 09/10/2016		
Lab ID: 1625967019		Received: 09/15/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T021670		Collected: 09/10/2016	
Lab ID: 1625967020		Received: 09/15/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 09/16/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	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 09/22/2016 11:23	/S/ Steven J. Sagers 09/22/2016 12:03

Laboratory Contact Information

ALS Environmental
960 W Levoe Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alsit.lab@ALSGlobal.com
Web: www.alsinc.com



ANALYTICAL REPORT

Workorder: **34-1625967**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
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Samples have not been blank corrected unless otherwise noted.
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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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10-16	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing:	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	CPSC	ANAB (ISO 17025, CPSC)	http://www.anab.org/accredited-organizations/
Soil, Dust, Paint, Air	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Dietary Supplements	ACLASS (ISO 17025)	http://www.aiclasscorp.com

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: 1625967

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analyst: IH GC-FID QC
Batch: IFID/7758 (HBN: 176711)
Analyzed By: Young Hee Yoon

Blank

MB: 518329 Analyzed: 09/15/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

MB: 518332 Analyzed: 09/15/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 518330 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample					LCSd: 518331 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.307	0.312	98.4	86.6 115.3	0.313	100	1.94	0.0 20.0	

LCS: 518333 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample					LCSd: 518334 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Acetonitrile	0.259	0.250	104	86.6 115.3	0.244	97.8	5.96	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 09/22/2016 11:23	/S/ Steven J. Sagers 09/22/2016 12:03

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



1425967

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A		C.O.C. No. 20162742		Page 1 of 2					
Collector JONES	Contact/Requestor CARL ROSS IV	Telephone No.	373-6961	MSIN	FAX	372-1878			
SAF No.	Sample Origin CARL ROSS IV	Purchase Order/Charge Code 202062/cus20							
Project Title CARTRIDGE EVALUATION	Logbook/ Work Package No.	Temp. ON ICE							
Shipped To (Lab) RUS	Method of Shipment N/A	Ice Chest No. 033							
Protocol N/A	Data Turnaround 10 DAYS	Bill of Lading/Air Bill No. 7722770728							
Parts and Return No.		41310							
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
S167021551	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-BASE-EFF	N/A			
S167021552	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-BASE-IN	N/A			
S167021553	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-BLANK1	N/A			
S167021554	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-BLANK2	N/A			
S167021555	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-A	N/A			
S167021556	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-B	N/A			
S167021557	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-C	N/A			
S167021558	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-D	N/A			
S167021559	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-E	N/A			
S167021560	VA	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-F	N/A			
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No									
SPECIAL INSTRUCTIONS Send Results to Carl Ross IV & Greg Moore Carroll email got to email RELEASE 9 Reference Contract # 55502									
Relinquished By Diane Turner	Print Sign JA Gradisher	Date/Time 9/14/16 0900	Received By WRPS	Print Sign Julie Goodwin	Date/Time 9/14/16 0900	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids	DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation X = Vapor Other		
Relinquished By WRPS	Print Sign WRPS	Date/Time 9/14/16 1400	Received By FEDEX	Print Sign FEDEX	Date/Time 9/16/16				
Relinquished By WRPS	Print Sign WRPS	Date/Time 9/14/16 1400	Received By MWH	Print Sign MWH	Date/Time 9/16/16				
Relinquished By WRPS	Print Sign WRPS	Date/Time 9/14/16 1400	Received By MWH	Print Sign MWH	Date/Time 9/16/16				
Disposal Method (e.g., Return to customer, per lab procedure, used in process)									
Young 16-01 Sept 16, 2016 4:30 PM									
All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.									

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20162742 Page 2 of 2	
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN T6-02 FAX 372-1878			
SAF No. N/A	Sample Origin CHARLOTTE EVALUATION	Purchase Order/Charge Code 202042/CB20		Temp. ON ICE			
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ice Chest No. WTS-033		7722770 4728			
Shipped To (Lab) AUS	Method of Shipment	Bill of Lading/AV Bill No.		4-1310			
Protocol N/A	Date Turnaround 10 DAYS	Parts and Return No.					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
	S16T021561	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-BFF-G	N/A	
	S16T021562	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-BFF-H	N/A	
	S16T021563	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-A	N/A	
	S16T021564	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-B	N/A	
	S16T021565	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-C	N/A	
	S16T021566	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-D	N/A	
	S16T021567	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-E	N/A	
	S16T021568	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-F	N/A	
	S16T021569	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-G	N/A	
	S16T021570	VA	9/10/16	CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-H	N/A	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Moore Carl.Howard@va.gov and Gregory.S.Moore@va.gov for email RELEASE 9 Reference Contract # 55502							
Relinquished By Dianne Turner Blumme Turner	Print VA Gradshteyn	Sign VA Gradshteyn	Date/Time 9/14/16 0900	Received By WRPS	Sign VA Gradshteyn	Date/Time 9/14/16 0900	Matrix* DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation O = Oil VA = Vapor X = Other
Relinquished By WRPS	Print VA Gradshteyn	Sign VA Gradshteyn	Date/Time 9/14/16 1400	Received By FEDEX	Sign FEDEX	Date/Time 9/14/16 1400	
Relinquished By Tally	Print Tally	Sign Tally	Date/Time 9/14/16 1400	Received By Munich Blumme and Spill	Sign Munich Blumme and Spill	Date/Time 9/14/16 1400	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By Young Man from Sept 16, 2016 10:30pm			
FINAL SAMPLE DISPOSITION				Date/Time			

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

C.3.6 Mercury

20162725 Rev. 0

FINAL REPORT ON MERCURY VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED SEPTEMBER 10, 2016

Document No.: 20162725 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
October 12, 2016



LAB #184777

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 October 12, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON MERCURY VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED SEPTEMBER 10, 2016**

This final report presents the results of forty mercury vapor tubes received at the 222-S Laboratory on September 12, 2016, in good condition and with adequate paperwork. The mercury vapor tubes were logged into sample delivery group 20162725.

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. Sixteen of the forty mercury results for sample group 20162725 were above the reporting limit of 0.05 µg per sample. For these samples, the total result includes the contribution from the back glass wool portion even though the back glass wool portion result is lower than the reporting limit (see Attachment 1).

20162725 Rev. 0

Attachment 1

DATA SUMMARY REPORT

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DATA SUMMARY REPORT FOR SAMPLE GROUP 20162725

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-07837-6-BASE-EFF	Total	S16T029302	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-BASE-EFF	Resin	S16T029303	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BASE-EFF	Glass Wool	S16T029304	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BASE-IN	Total	S16T029305	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-BASE-IN	Resin	S16T029306	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BASE-IN	Glass Wool	S16T029307	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BLANK1	Total	S16T029308	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-BLANK1	Resin	S16T029309	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BLANK1	Glass Wool	S16T029310	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BLANK2	Total	S16T029311	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-BLANK2	Resin	S16T029312	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-BLANK2	Glass Wool	S16T029313	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-A	Total	S16T029314	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-A	Resin	S16T029315	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-A	Glass Wool	S16T029316	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-B	Total	S16T029317	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-B	Resin	S16T029318	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-B	Glass Wool	S16T029319	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-C	Total	S16T029320	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-C	Resin	S16T029321	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-C	Glass Wool	S16T029322	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-D	Total	S16T029323	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-D	Resin	S16T029324	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-D	Glass Wool	S16T029325	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-E	Total	S16T029326	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-E	Resin	S16T029327	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-E	Glass Wool	S16T029328	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-F	Total	S16T029329	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-F	Resin	S16T029330	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-F	Glass Wool	S16T029331	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-G	Total	S16T029332	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-G	Resin	S16T029333	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-G	Glass Wool	S16T029334	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-H	Total	S16T029335	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-07837-6-EFF-H	Resin	S16T029336	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-EFF-H	Glass Wool	S16T029337	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-A	Total	S16T029338	Mercury	µg/sample	n/a	<0.0500	0.159	0.0500
16-07837-6-IN-A	Resin	S16T029339	Mercury	µg/sample	103	<0.0500	0.154	0.0500
16-07837-6-IN-A	Glass Wool	S16T029340	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-B	Total	S16T029341	Mercury	µg/sample	n/a	<0.0500	0.170	0.0500
16-07837-6-IN-B	Resin	S16T029342	Mercury	µg/sample	103	<0.0500	0.165	0.0500
16-07837-6-IN-B	Glass Wool	S16T029343	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-C	Total	S16T029344	Mercury	µg/sample	n/a	<0.0500	0.144	0.0500
16-07837-6-IN-C	Resin	S16T029345	Mercury	µg/sample	103	<0.0500	0.139	0.0500
16-07837-6-IN-C	Glass Wool	S16T029346	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-D	Total	S16T029347	Mercury	µg/sample	n/a	<0.0500	0.138	0.0500
16-07837-6-IN-D	Resin	S16T029348	Mercury	µg/sample	103	<0.0500	0.133	0.0500
16-07837-6-IN-D	Glass Wool	S16T029349	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162725

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-07837-6-IN-E	Total	S16T029350	Mercury	µg/sample	n/a	<0.0500	0.138	0.0500
16-07837-6-IN-E	Resin	S16T029351	Mercury	µg/sample	103	<0.0500	0.133	0.0500
16-07837-6-IN-E	Glass Wool	S16T029352	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-F	Total	S16T029353	Mercury	µg/sample	n/a	<0.0500	0.152	0.0500
16-07837-6-IN-F	Resin	S16T029354	Mercury	µg/sample	103	<0.0500	0.147	0.0500
16-07837-6-IN-F	Glass Wool	S16T029355	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-G	Total	S16T029356	Mercury	µg/sample	n/a	<0.0500	0.114	0.0500
16-07837-6-IN-G	Resin	S16T029357	Mercury	µg/sample	103	<0.0500	0.109	0.0500
16-07837-6-IN-G	Glass Wool	S16T029358	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-07837-6-IN-H	Total	S16T029359	Mercury	µg/sample	n/a	<0.0500	0.104	0.0500
16-07837-6-IN-H	Resin	S16T029360	Mercury	µg/sample	103	<0.0500	0.0994	0.0500
16-07837-6-IN-H	Glass Wool	S16T029361	Mercury	µg/sample	103	<0.0500	<0.0500	0.0500
16-08068-6-BASE-EFF	Total	S16T029362	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-BASE-EFF	Resin	S16T029363	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BASE-EFF	Glass Wool	S16T029364	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BASE-IN	Total	S16T029365	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-BASE-IN	Resin	S16T029366	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BASE-IN	Glass Wool	S16T029367	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-EFF	Total	S16T029368	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-EFF	Resin	S16T029369	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-EFF	Glass Wool	S16T029370	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-IN	Total	S16T029371	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-IN	Resin	S16T029372	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-BLANK-IN	Glass Wool	S16T029373	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-A	Total	S16T029374	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-A	Resin	S16T029375	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-A	Glass Wool	S16T029376	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-B	Total	S16T029820	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-B	Resin	S16T029821	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-B	Glass Wool	S16T029822	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-C	Total	S16T029823	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-C	Resin	S16T029824	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-C	Glass Wool	S16T029825	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-D	Total	S16T029826	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-D	Resin	S16T029827	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-D	Glass Wool	S16T029828	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-E	Total	S16T029829	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-E	Resin	S16T029830	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-E	Glass Wool	S16T029831	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-F	Total	S16T029832	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-F	Resin	S16T029833	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-F	Glass Wool	S16T029834	Mercury	µg/sample	97.1	<0.0500	<0.0500	0.0500
16-08068-6-EFF-G	Total	S16T029835	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-EFF-G	Resin	S16T029836	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-EFF-G	Glass Wool	S16T029837	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-EFF-H	Total	S16T029838	Mercury	µg/sample	n/a	<0.0500	0.115	0.0500
16-08068-6-EFF-H	Resin	S16T029839	Mercury	µg/sample	94.6	<0.0500	0.110	0.0500
16-08068-6-EFF-H	Glass Wool	S16T029840	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162725

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08068-6-IN-A	Total	S16T029841	Mercury	µg/sample	n/a	<0.0500	0.153	0.0500
16-08068-6-IN-A	Resin	S16T029842	Mercury	µg/sample	94.6	<0.0500	0.148	0.0500
16-08068-6-IN-A	Glass Wool	S16T029843	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-B	Total	S16T029844	Mercury	µg/sample	n/a	<0.0500	0.122	0.0500
16-08068-6-IN-B	Resin	S16T029845	Mercury	µg/sample	94.6	<0.0500	0.117	0.0500
16-08068-6-IN-B	Glass Wool	S16T029846	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-C	Total	S16T029847	Mercury	µg/sample	n/a	<0.0500	0.144	0.0500
16-08068-6-IN-C	Resin	S16T029848	Mercury	µg/sample	94.6	<0.0500	0.139	0.0500
16-08068-6-IN-C	Glass Wool	S16T029849	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-D	Total	S16T029850	Mercury	µg/sample	n/a	<0.0500	0.158	0.0500
16-08068-6-IN-D	Resin	S16T029851	Mercury	µg/sample	94.6	<0.0500	0.152	0.0500
16-08068-6-IN-D	Glass Wool	S16T029852	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-E	Total	S16T029853	Mercury	µg/sample	n/a	<0.0500	0.146	0.0500
16-08068-6-IN-E	Resin	S16T029854	Mercury	µg/sample	94.6	<0.0500	0.141	0.0500
16-08068-6-IN-E	Glass Wool	S16T029855	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-F	Total	S16T029856	Mercury	µg/sample	n/a	<0.0500	0.142	0.0500
16-08068-6-IN-F	Resin	S16T029857	Mercury	µg/sample	94.6	<0.0500	0.136	0.0500
16-08068-6-IN-F	Glass Wool	S16T029858	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-G	Total	S16T029859	Mercury	µg/sample	n/a	<0.0500	0.111	0.0500
16-08068-6-IN-G	Resin	S16T029860	Mercury	µg/sample	94.6	<0.0500	0.106	0.0500
16-08068-6-IN-G	Glass Wool	S16T029861	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-H	Total	S16T029862	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08068-6-IN-H	Resin	S16T029863	Mercury	µg/sample	94.6	<0.0500	<0.0500	0.0500
16-08068-6-IN-H	Glass Wool	S16T029864	Mercury	µg/sample	94.6	<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 20162725

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T029303	16-07837-6-BASE-EFF	Mercury	09/14/2016 08:00	09/14/2016 13:02
S16T029304	16-07837-6-BASE-EFF	Mercury	09/14/2016 08:00	09/14/2016 13:03
S16T029306	16-07837-6-BASE-IN	Mercury	09/14/2016 08:00	09/14/2016 13:05
S16T029307	16-07837-6-BASE-IN	Mercury	09/14/2016 08:00	09/14/2016 13:07
S16T029309	16-07837-6-BLANK1	Mercury	09/14/2016 08:00	09/14/2016 13:08
S16T029310	16-07837-6-BLANK1	Mercury	09/14/2016 08:00	09/14/2016 13:10
S16T029312	16-07837-6-BLANK2	Mercury	09/14/2016 08:00	09/14/2016 13:15
S16T029313	16-07837-6-BLANK2	Mercury	09/14/2016 08:00	09/14/2016 13:16
S16T029315	16-07837-6-EFF-A	Mercury	09/14/2016 08:00	09/14/2016 13:18
S16T029316	16-07837-6-EFF-A	Mercury	09/14/2016 08:00	09/14/2016 13:20
S16T029318	16-07837-6-EFF-B	Mercury	09/14/2016 08:00	09/14/2016 13:21
S16T029319	16-07837-6-EFF-B	Mercury	09/14/2016 08:00	09/14/2016 13:23
S16T029321	16-07837-6-EFF-C	Mercury	09/14/2016 08:00	09/14/2016 13:24
S16T029322	16-07837-6-EFF-C	Mercury	09/14/2016 08:00	09/14/2016 13:26
S16T029324	16-07837-6-EFF-D	Mercury	09/14/2016 08:00	09/14/2016 13:28
S16T029325	16-07837-6-EFF-D	Mercury	09/14/2016 08:00	09/14/2016 13:29
S16T029327	16-07837-6-EFF-E	Mercury	09/14/2016 08:00	09/14/2016 13:34
S16T029328	16-07837-6-EFF-E	Mercury	09/14/2016 08:00	09/14/2016 13:36
S16T029330	16-07837-6-EFF-F	Mercury	09/14/2016 08:00	09/14/2016 13:37
S16T029331	16-07837-6-EFF-F	Mercury	09/14/2016 08:00	09/14/2016 13:39
S16T029333	16-07837-6-EFF-G	Mercury	09/14/2016 08:00	09/14/2016 13:46
S16T029334	16-07837-6-EFF-G	Mercury	09/14/2016 08:00	09/14/2016 13:47
S16T029336	16-07837-6-EFF-H	Mercury	09/14/2016 08:00	09/14/2016 13:57
S16T029337	16-07837-6-EFF-H	Mercury	09/14/2016 08:00	09/14/2016 13:58
S16T029339	16-07837-6-IN-A	Mercury	09/14/2016 08:00	09/14/2016 14:00
S16T029340	16-07837-6-IN-A	Mercury	09/14/2016 08:00	09/14/2016 14:02
S16T029342	16-07837-6-IN-B	Mercury	09/14/2016 08:00	09/14/2016 14:03
S16T029343	16-07837-6-IN-B	Mercury	09/14/2016 08:00	09/14/2016 14:05
S16T029345	16-07837-6-IN-C	Mercury	09/14/2016 08:00	09/14/2016 14:07
S16T029346	16-07837-6-IN-C	Mercury	09/14/2016 08:00	09/14/2016 14:08
S16T029348	16-07837-6-IN-D	Mercury	09/14/2016 08:00	09/14/2016 14:10
S16T029349	16-07837-6-IN-D	Mercury	09/14/2016 08:00	09/14/2016 14:12
S16T029351	16-07837-6-IN-E	Mercury	09/14/2016 08:00	09/14/2016 14:17
S16T029352	16-07837-6-IN-E	Mercury	09/14/2016 08:00	09/14/2016 14:19
S16T029354	16-07837-6-IN-F	Mercury	09/14/2016 08:00	09/14/2016 14:20
S16T029355	16-07837-6-IN-F	Mercury	09/14/2016 08:00	09/14/2016 14:22
S16T029357	16-07837-6-IN-G	Mercury	09/14/2016 08:00	09/14/2016 14:24
S16T029358	16-07837-6-IN-G	Mercury	09/14/2016 08:00	09/14/2016 14:26
S16T029360	16-07837-6-IN-H	Mercury	09/14/2016 08:00	09/14/2016 14:27
S16T029361	16-07837-6-IN-H	Mercury	09/14/2016 08:00	09/14/2016 14:29
S16T029363	16-08068-6-BASE-EEF	Mercury	09/14/2016 10:00	09/14/2016 16:15
S16T029364	16-08068-6-BASE-EEF	Mercury	09/14/2016 10:00	09/14/2016 16:16
S16T029366	16-08068-6-BASE-IN	Mercury	09/14/2016 10:00	09/14/2016 16:18
S16T029367	16-08068-6-BASE-IN	Mercury	09/14/2016 10:00	09/14/2016 16:20
S16T029369	16-08068-6-BLANK-EFF	Mercury	09/14/2016 10:00	09/14/2016 16:21
S16T029370	16-08068-6-BLANK-EFF	Mercury	09/14/2016 10:00	09/14/2016 16:23

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162725

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T029372	16-08068-6-BLANK-IN	Mercury	09/14/2016 10:00	09/14/2016 16:28
S16T029373	16-08068-6-BLANK-IN	Mercury	09/14/2016 10:00	09/14/2016 16:29
S16T029375	16-08068-6-EFF-A	Mercury	09/14/2016 10:00	09/14/2016 16:31
S16T029376	16-08068-6-EFF-A	Mercury	09/14/2016 10:00	09/14/2016 16:32
S16T029821	16-08068-6-EFF-B	Mercury	09/14/2016 10:00	09/14/2016 16:34
S16T029822	16-08068-6-EFF-B	Mercury	09/14/2016 10:00	09/14/2016 16:35
S16T029824	16-08068-6-EFF-C	Mercury	09/14/2016 10:00	09/14/2016 16:37
S16T029825	16-08068-6-EFF-C	Mercury	09/14/2016 10:00	09/14/2016 16:38
S16T029827	16-08068-6-EFF-D	Mercury	09/14/2016 10:00	09/14/2016 16:40
S16T029828	16-08068-6-EFF-D	Mercury	09/14/2016 10:00	09/14/2016 16:41
S16T029830	16-08068-6-EFF-E	Mercury	09/14/2016 10:00	09/14/2016 16:46
S16T029831	16-08068-6-EFF-E	Mercury	09/14/2016 10:00	09/14/2016 16:48
S16T029833	16-08068-6-EFF-F	Mercury	09/14/2016 10:00	09/14/2016 16:49
S16T029834	16-08068-6-EFF-F	Mercury	09/14/2016 10:00	09/14/2016 16:51
S16T029836	16-08068-6-EFF-G	Mercury	09/14/2016 10:00	09/14/2016 16:58
S16T029837	16-08068-6-EFF-G	Mercury	09/14/2016 10:00	09/14/2016 16:59
S16T029839	16-08068-6-EFF-H	Mercury	09/14/2016 10:00	09/14/2016 17:04
S16T029840	16-08068-6-EFF-H	Mercury	09/14/2016 10:00	09/14/2016 17:06
S16T029842	16-08068-6-IN-A	Mercury	09/14/2016 10:00	09/14/2016 17:08
S16T029843	16-08068-6-IN-A	Mercury	09/14/2016 10:00	09/14/2016 17:10
S16T029845	16-08068-6-IN-B	Mercury	09/14/2016 10:00	09/14/2016 17:12
S16T029846	16-08068-6-IN-B	Mercury	09/14/2016 10:00	09/14/2016 17:14
S16T029848	16-08068-6-IN-C	Mercury	09/14/2016 10:00	09/14/2016 17:15
S16T029849	16-08068-6-IN-C	Mercury	09/14/2016 10:00	09/14/2016 17:17
S16T029851	16-08068-6-IN-D	Mercury	09/14/2016 10:00	09/14/2016 17:19
S16T029852	16-08068-6-IN-D	Mercury	09/14/2016 10:00	09/14/2016 17:21
S16T029854	16-08068-6-IN-E	Mercury	09/14/2016 10:00	09/14/2016 17:26
S16T029855	16-08068-6-IN-E	Mercury	09/14/2016 10:00	09/14/2016 17:28
S16T029857	16-08068-6-IN-F	Mercury	09/14/2016 10:00	09/14/2016 17:30
S16T029858	16-08068-6-IN-F	Mercury	09/14/2016 10:00	09/14/2016 17:32
S16T029860	16-08068-6-IN-G	Mercury	09/14/2016 10:00	09/14/2016 17:34
S16T029861	16-08068-6-IN-G	Mercury	09/14/2016 10:00	09/14/2016 17:35
S16T029863	16-08068-6-IN-H	Mercury	09/14/2016 10:00	09/14/2016 17:37
S16T029864	16-08068-6-IN-H	Mercury	09/14/2016 10:00	09/14/2016 17:39

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Attachment 3

RECEIPT PAPERWORK

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Cartridge Testing

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST			ATS-LO-090-101 Rev DG-1
Date Samples Received: <u>9-12-16</u> Total Number of Samples: <u>478</u> Group #: <u>20162725-H9</u>				
Sample Custodian: <u>DIANNE TURNER</u> IH Technician: <u>CHRISTOPHER MOON</u>				
Sample Custodian to Complete:				
Action	Yes	No	N/A	Comments
RSR provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Verify GKI is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File
Received from an alpha facility?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record cooler temperature in centigrade, as appropriate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Date and time of sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Sampling location or origin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Container type, size, and number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Preservatives (if used) noted on the COC/RSA and sample bottles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
• Analysis request is clear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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 Initials: <u>dlr</u> Date: <u>9-12-16</u>				
If No, comment on communication and resolution:				
WRPS SHIP 280 Run 118 WHL Run 80 (40NH ₃ , 40H ₂) Acetonitrile 40 Broken Furan Tube 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>38</u>	VOA: <u>40</u>	Other-IH: _____

A-6005-302 (REV 4)

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-07837 - 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
516T029302	16-07837-6-BASE-EFF / Hydrar (SKC 226-17-1A) 516T029303 516T029304	Hg-Elemental Source
516T029305	16-07837-6-BASE-IN / Hydrar (SKC 226-17-1A) 516T029306 516T029307	Hg-Elemental Source
516T029308	16-07837-6-BLANK1 / Hydrar (SKC 226-17-1A) 516T029309 516T029310	Hg-Elemental Source
516T029311	16-07837-6-BLANK2 / Hydrar (SKC 226-17-1A) 516T029312 516T029313	Hg-Elemental Source
516T029314	16-07837-6-EFF-A / Hydrar (SKC 226-17-1A) 516T029315 516T029314 516T029316	Hg-Elemental Source
516T029317	16-07837-6-EFF-B / Hydrar (SKC 226-17-1A) 516T029318 516T029319	Hg-Elemental Source
516T029320	16-07837-6-EFF-C / Hydrar (SKC 226-17-1A) 516T029321 516T029322	Hg-Elemental Source
516T029323	16-07837-6-EFF-D / Hydrar (SKC 226-17-1A) 516T029324 516T029325	Hg-Elemental Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	[Signature]	RYAN BURNS	2704 AV H104	9/10/16	0631
Retrieved from Storage:	CMOON	Christie Moon		9/12/16	1057

	Signature	Printed Name	Date	Time
Relinquished By:	CMOON	Christie Moon	9/12/16	1330
Received By:	[Signature]	Sharon L. Holden	9-12-16	1330
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 1/10/16	
CACN: 202062	COA: EB20	Survey No.: 16-07837 - Cartridge Testing	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: NA	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
SL6T029326	16-07837-6-EFF-E / Hydrar (SKC 226-17-1A) . 516T029327 516T029328	Hg-Elemental Source
SL6T029329	16-07837-6-EFF-F / Hydrar (SKC 226-17-1A) . 516T029330 516T029331	Hg-Elemental Source
SL6T029332	16-07837-6-EFF-G / Hydrar (SKC 226-17-1A) . 516T029333 516T029334	Hg-Elemental Source
SL6T029335	16-07837-6-EFF-H / Hydrar (SKC 226-17-1A) . 516T029336 516T029337	Hg-Elemental Source
SL6T029338	16-07837-6-IN-A / Hydrar (SKC 226-17-1A) . 516T029339 516T029340	Hg-Elemental Source
SL6T029341	16-07837-6-IN-B / Hydrar (SKC 226-17-1A) . 516T029342 516T029343	Hg-Elemental Source
SL6T029344	16-07837-6-IN-C / Hydrar (SKC 226-17-1A) . 516T029345 516T029346	Hg-Elemental Source
SL6T029347	16-07837-6-IN-D / Hydrar (SKC 226-17-1A) . 516T029348 516T029349	Hg-Elemental Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	KL	RYAN BURNS	2704PV H104	9/10/16	0639
Retrieved from Storage:	Cmoon	Christie Moon		9/12/16	1057

	Signature	Printed Name	Date	Time
Relinquished By:	Cmoon	Christie Moon	9/12/16	1330
Received By:	Sharon Lilolden	Sharon Lilolden	9-12-16	1330
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-07837 - Cartridge Testing	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: NA	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
516T029350	16-07837-6-IN-E / Hydrar (SKC 226-17-1A) 516T029351 516T029352	Hg-Elemental Source
516T029353	16-07837-6-IN-F / Hydrar (SKC 226-17-1A) 516T029354 516T029355	Hg-Elemental Source
516T029356	16-07837-6-IN-G / Hydrar (SKC 226-17-1A) 516T029357 516T029358	Hg-Elemental Source
516T029359	16-07837-6-IN-H / Hydrar (SKC 226-17-1A) 516T029360 516T029361	Hg-Elemental Source
	16-07837-7-BASE-EFF / CISA (SKC 226-29)	NH3-Source
	16-07837-7-BASE-IN / CISA (SKC 226-29)	NH3 Source
	16-07837-7-BLANK1 / CISA (SKC 226-29)	NH3 Source
	16-07837-7-BLANK2 / CISA (SKC 226-29)	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	[Signature]	RYAN BURNS	2704 HV 12104	9/10/16	0639
Retrieved from Storage:	[Signature]	Christemow		9/12/16	1057

	Signature	Printed Name	Date	Time
Relinquished By:	[Signature]	Chastemow	9/12/16	1330
Received By:	[Signature]	Sharon Lilaldu	9-12-16	1330
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-08068 - 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
516T029362	16-08068-6-BASE-EFF / Hydrar (SKC 226-17-1A) , 516T029363 516T029364	Hg-Elemental Source
516T029365	16-08068-6-BASE-IN / Hydrar (SKC 226-17-1A) , 516T029366 516T029367	Hg-Elemental Source
516T029368	16-08068-6-BLANK-EFF / Hydrar (SKC 226-17-1A) , 516T029369 516T029370	Hg-Elemental Source
516T029371	16-08068-6-BLANK-IN / Hydrar (SKC 226-17-1A) , 516T029372 516T029373	Hg-Elemental Source
516T029374	16-08068-6-EFF-A / Hydrar (SKC 226-17-1A) , 516T029375 516T029376	Hg-Elemental Source
516T029820	16-08068-6-EFF-B / Hydrar (SKC 226-17-1A) , 516T029821 516T029822	Hg-Elemental Source
516T029823	16-08068-6-EFF-C / Hydrar (SKC 226-17-1A) , 516T029824 516T029825	Hg-Elemental Source
516T029826	16-08068-6-EFF-D / Hydrar (SKC 226-17-1A) , 516T029827 516T029828	Hg-Elemental Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Christie Moon	Christie Moon	8704HU/H104	9/10/16	0300
Retrieved from Storage:	Christie Moon	Christie Moon		9/12/16	1154

	Signature	Printed Name	Date	Time
Relinquished By:	Christie Moon	Christie Moon	9/12/16	1330
Received By:	Dianne Turner	DIANNE TURNER	9-12-16	13:30
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-08068 - 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
516T029829	16-08068-6-EFF-E / Hydrar (SKC 226-17-1A), 516T029830 516T029831	Hg-Elemental Source
516T029832	16-08068-6-EFF-F / Hydrar (SKC 226-17-1A), 516T029833 516T029834	Hg-Elemental Source
516T029835	16-08068-6-EFF-G / Hydrar (SKC 226-17-1A), 516T029836 516T029837	Hg-Elemental Source
516T029838	16-08068-6-EFF-H / Hydrar (SKC 226-17-1A), 516T029839 516T029840	Hg-Elemental Source
516T029841	16-08068-6-IN-A / Hydrar (SKC 226-17-1A), 516T029842 516T029843	Hg-Elemental Source
516T029844	16-08068-6-IN-B / Hydrar (SKC 226-17-1A), 516T029845 516T029846	Hg-Elemental Source
516T029847	16-08068-6-IN-C / Hydrar (SKC 226-17-1A), 516T029848 516T029849	Hg-Elemental Source
516T029850	16-08068-6-IN-D / Hydrar (SKC 226-17-1A), 516T029851 516T029852	Hg-Elemental Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Chris Moon	Chris Moon	2704 HU / H104	9/10/16	0300
Retrieved from Storage:	Chris Moon	Chris Moon		9/12/16	1154

	Signature	Printed Name	Date	Time
Relinquished By:	Chris Moon	Chris Moon	9/12/16	1330
Received By:	Dianne Turner	DIANNE TURNER	9-12-16	13:30
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

SWIHD - Chain of Custody

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/10/16	
CACN: 202002	COA: CB20	Survey No.: 16-08068 - Cartridge Testing	
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
5167029853	16-08068-6-IN-E / Hydrar (SKC 226-17-1A) 5167029854 5167029855	Hg-Elemental Source
5167029856	16-08068-6-IN-F / Hydrar (SKC 226-17-1A) 5167029857 5167029858	Hg-Elemental Source
5167029859	16-08068-6-IN-G / Hydrar (SKC 226-17-1A) 5167029860 5167029861	Hg-Elemental Source
5167029862	16-08068-6-IN-H / Hydrar (SKC 226-17-1A) 5167029863 5167029864	Hg-Elemental Source
	16-08068-7-BASE-EFF / CISA (SKC 226-29)	NH3 Source
	16-08068-7-BASE-IN / CISA (SKC 226-29)	NH3 Source
	16-08068-7-BLANK-EFF / CISA (SKC 226-29)	NH3 Source
	16-08068-7-BLANK-IN / CISA (SKC 226-29)	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Chris Sherman	Chris Sherman	2704 HU/H104	9/10/16	0300
Retrieved from Storage:	Chris Sherman	Chris Sherman		9/12/16	1154

	Signature	Printed Name	Date	Time
Relinquished By:	Chris Sherman	Chris Sherman	9-12-16	1330
Received By:	Dianne Turner	DIANNE TURNER	9-12-16	1330
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

C.3.7 Ammonia

20162724 Rev. 0

FINAL REPORT ON AMMONIA VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED SEPTEMBER 10, 2016

Document No.: 20162724 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
October 12, 2016



LAB #184777

Prepared for:




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Washington River Protection
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P.O. Box 850
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509-376-0737

Prepared by:



WAI Hanford Laboratory
1955 Jadwin Ave, Suite 330
Richland, WA 99354
509-373-3240

 October 12, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON AMMONIA VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED SEPTEMBER 10, 2016**

This final report presents the results of forty ammonia vapor tubes received at the 222-S Laboratory on September 12, 2016, in good condition and with adequate paperwork. The samples were logged into sample delivery group 20162724.

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. 2-5 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 and 80 - 120% for LA-503-157, 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. Thirty-two of the forty ammonia results for sample group 20162724 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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DATA SUMMARY REPORT FOR SAMPLE GROUP 20162724

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-07837-7-BASE-EFF	Total	S16T029865	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-07837-7-BASE-EFF	Front Resin	S16T029866	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BASE-EFF	Back Resin	S16T029867	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BASE-IN	Total	S16T029868	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-07837-7-BASE-IN	Front Resin	S16T029869	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BASE-IN	Back Resin	S16T029870	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BLANK1	Total	S16T029871	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-07837-7-BLANK1	Front Resin	S16T029872	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BLANK1	Back Resin	S16T029873	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BLANK2	Total	S16T029874	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-07837-7-BLANK2	Front Resin	S16T029875	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-BLANK2	Back Resin	S16T029876	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-A	Total	S16T029877	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-07837-7-EFF-A	Front Resin	S16T029878	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-A	Back Resin	S16T029879	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-B	Total	S16T029880	Ammonia	µg/sample	n/a	<10.0	683	100
16-07837-7-EFF-B	Front Resin	S16T029881	Ammonia	µg/sample	101	<10.0	682	100
16-07837-7-EFF-B	Back Resin	S16T029882	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-C	Total	S16T029883	Ammonia	µg/sample	n/a	<10.0	2.11E+03	250
16-07837-7-EFF-C	Front Resin	S16T029884	Ammonia	µg/sample	101	<10.0	2.11E+03	250
16-07837-7-EFF-C	Back Resin	S16T029885	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-D	Total	S16T029886	Ammonia	µg/sample	n/a	<10.0	1.34E+03	250
16-07837-7-EFF-D	Front Resin	S16T029887	Ammonia	µg/sample	101	<10.0	1.34E+03	250
16-07837-7-EFF-D	Back Resin	S16T029888	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-E	Total	S16T029889	Ammonia	µg/sample	n/a	<10.0	2.56E+03	500
16-07837-7-EFF-E	Front Resin	S16T029890	Ammonia	µg/sample	101	<10.0	2.56E+03	500
16-07837-7-EFF-E	Back Resin	S16T029891	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-F	Total	S16T029892	Ammonia	µg/sample	n/a	<10.0	2.30E+03	250
16-07837-7-EFF-F	Front Resin	S16T029893	Ammonia	µg/sample	101	<10.0	2.30E+03	250
16-07837-7-EFF-F	Back Resin	S16T029894	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-G	Total	S16T029895	Ammonia	µg/sample	n/a	<10.0	2.53E+03	500
16-07837-7-EFF-G	Front Resin	S16T029896	Ammonia	µg/sample	101	<10.0	2.53E+03	500
16-07837-7-EFF-G	Back Resin	S16T029897	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-EFF-H	Total	S16T029898	Ammonia	µg/sample	n/a	<10.0	2.39E+03	500
16-07837-7-EFF-H	Front Resin	S16T029899	Ammonia	µg/sample	101	<10.0	2.39E+03	500
16-07837-7-EFF-H	Back Resin	S16T029900	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-A	Total	S16T029901	Ammonia	µg/sample	n/a	<10.0	2.93E+03	500
16-07837-7-IN-A	Front Resin	S16T029902	Ammonia	µg/sample	101	<10.0	2.93E+03	500
16-07837-7-IN-A	Back Resin	S16T029903	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-B	Total	S16T029904	Ammonia	µg/sample	n/a	<10.0	3.21E+03	500
16-07837-7-IN-B	Front Resin	S16T029905	Ammonia	µg/sample	101	<10.0	3.21E+03	500
16-07837-7-IN-B	Back Resin	S16T029906	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-C	Total	S16T029907	Ammonia	µg/sample	n/a	<10.0	3.25E+03	500
16-07837-7-IN-C	Front Resin	S16T029908	Ammonia	µg/sample	101	<10.0	3.25E+03	500
16-07837-7-IN-C	Back Resin	S16T029909	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-D	Total	S16T029910	Ammonia	µg/sample	n/a	<10.0	2.91E+03	500
16-07837-7-IN-D	Front Resin	S16T029911	Ammonia	µg/sample	101	<10.0	2.91E+03	500
16-07837-7-IN-D	Back Resin	S16T029912	Ammonia	µg/sample	101	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162724

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-07837-7-IN-E	Total	S16T029913	Ammonia	µg/sample	n/a	<10.0	3.07E+03	500
16-07837-7-IN-E	Front Resin	S16T029914	Ammonia	µg/sample	101	<10.0	3.07E+03	500
16-07837-7-IN-E	Back Resin	S16T029915	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-F	Total	S16T029916	Ammonia	µg/sample	n/a	<10.0	3.05E+03	500
16-07837-7-IN-F	Front Resin	S16T029917	Ammonia	µg/sample	101	<10.0	3.05E+03	500
16-07837-7-IN-F	Back Resin	S16T029918	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-G	Total	S16T029919	Ammonia	µg/sample	n/a	<10.0	3.04E+03	500
16-07837-7-IN-G	Front Resin	S16T029920	Ammonia	µg/sample	101	<10.0	3.04E+03	500
16-07837-7-IN-G	Back Resin	S16T029921	Ammonia	µg/sample	101	<10.0	<10.0	10.0
16-07837-7-IN-H	Total	S16T029922	Ammonia	µg/sample	n/a	<10.0	2.51E+03	500
16-07837-7-IN-H	Front Resin	S16T029923	Ammonia	µg/sample	92.6	<10.0	2.51E+03	500
16-07837-7-IN-H	Back Resin	S16T029924	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BASE-EFF	Total	S16T029925	Ammonia	µg/sample	n/a	<10.0	10.1	10.0
16-08068-7-BASE-EFF	Front Resin	S16T029926	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BASE-EFF	Back Resin	S16T029927	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BASE-IN	Total	S16T029928	Ammonia	µg/sample	n/a	<10.0	15.5	10.0
16-08068-7-BASE-IN	Front Resin	S16T029929	Ammonia	µg/sample	92.6	<10.0	15.2	10.0
16-08068-7-BASE-IN	Back Resin	S16T029930	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BLANK-EFF	Total	S16T029931	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-08068-7-BLANK-EFF	Front Resin	S16T029932	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BLANK-EFF	Back Resin	S16T029933	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BLANK-IN	Total	S16T029934	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-08068-7-BLANK-IN	Front Resin	S16T029935	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BLANK-IN	Back Resin	S16T029936	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-A	Total	S16T029937	Ammonia	µg/sample	n/a	<10.0	2.71E+03	500
16-08068-7-IN-A	Front Resin	S16T029938	Ammonia	µg/sample	92.6	<10.0	2.71E+03	500
16-08068-7-IN-A	Back Resin	S16T029939	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-B	Total	S16T029940	Ammonia	µg/sample	n/a	<10.0	2.59E+03	500
16-08068-7-IN-B	Front Resin	S16T029941	Ammonia	µg/sample	92.6	<10.0	2.59E+03	500
16-08068-7-IN-B	Back Resin	S16T029942	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-C	Total	S16T029943	Ammonia	µg/sample	n/a	<10.0	2.88E+03	500
16-08068-7-IN-C	Front Resin	S16T029944	Ammonia	µg/sample	92.6	<10.0	2.88E+03	500
16-08068-7-IN-C	Back Resin	S16T029945	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-D	Total	S16T029946	Ammonia	µg/sample	n/a	<10.0	2.92E+03	500
16-08068-7-IN-D	Front Resin	S16T029947	Ammonia	µg/sample	92.6	<10.0	2.92E+03	500
16-08068-7-IN-D	Back Resin	S16T029948	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-E	Total	S16T029949	Ammonia	µg/sample	n/a	<10.0	2.85E+03	500
16-08068-7-IN-E	Front Resin	S16T029950	Ammonia	µg/sample	92.6	<10.0	2.85E+03	500
16-08068-7-IN-E	Back Resin	S16T029951	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-F	Total	S16T029952	Ammonia	µg/sample	n/a	<10.0	2.79E+03	500
16-08068-7-IN-F	Front Resin	S16T029953	Ammonia	µg/sample	92.6	<10.0	2.79E+03	500
16-08068-7-IN-F	Back Resin	S16T029954	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-G	Total	S16T029955	Ammonia	µg/sample	n/a	<10.0	2.85E+03	500
16-08068-7-IN-G	Front Resin	S16T029956	Ammonia	µg/sample	105	<10.0	2.85E+03	500
16-08068-7-IN-G	Back Resin	S16T029957	Ammonia	µg/sample	105	<10.0	<10.0	10.0
16-08068-7-IN-H	Total	S16T029958	Ammonia	µg/sample	n/a	<10.0	2.57E+03	500
16-08068-7-IN-H	Front Resin	S16T029959	Ammonia	µg/sample	92.6	<10.0	2.57E+03	500
16-08068-7-IN-H	Back Resin	S16T029960	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20162724

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08068-7-EFF-A	Total	S16T029961	Ammonia	µg/sample	n/a	<10.0	19.5	10.0
16-08068-7-EFF-A	Front Resin	S16T029962	Ammonia	µg/sample	92.6	<10.0	19.0	10.0
16-08068-7-EFF-A	Back Resin	S16T029963	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-B	Total	S16T029964	Ammonia	µg/sample	n/a	<10.0	614	500
16-08068-7-EFF-B	Front Resin	S16T029965	Ammonia	µg/sample	92.6	<10.0	614	500
16-08068-7-EFF-B	Back Resin	S16T029966	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-C	Total	S16T029967	Ammonia	µg/sample	n/a	<10.0	2.00E+03	500
16-08068-7-EFF-C	Front Resin	S16T029968	Ammonia	µg/sample	92.6	<10.0	2.00E+03	500
16-08068-7-EFF-C	Back Resin	S16T029969	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-D	Total	S16T029970	Ammonia	µg/sample	n/a	<10.0	781	500
16-08068-7-EFF-D	Front Resin	S16T029971	Ammonia	µg/sample	92.6	<10.0	781	500
16-08068-7-EFF-D	Back Resin	S16T029972	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-E	Total	S16T029973	Ammonia	µg/sample	n/a	<10.0	<10.0	10.0
16-08068-7-EFF-E	Front Resin	S16T029974	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-E	Back Resin	S16T029975	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-F	Total	S16T029976	Ammonia	µg/sample	n/a	<10.0	2.13E+03	500
16-08068-7-EFF-F	Front Resin	S16T029977	Ammonia	µg/sample	92.6	<10.0	2.13E+03	500
16-08068-7-EFF-F	Back Resin	S16T029978	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-G	Total	S16T029979	Ammonia	µg/sample	n/a	<10.0	2.52E+03	500
16-08068-7-EFF-G	Front Resin	S16T029980	Ammonia	µg/sample	92.6	<10.0	2.52E+03	500
16-08068-7-EFF-G	Back Resin	S16T029981	Ammonia	µg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-EFF-H	Total	S16T029982	Ammonia	µg/sample	n/a	<10.0	3.08E+03	500
16-08068-7-EFF-H	Front Resin	S16T029983	Ammonia	µg/sample	105	<10.0	3.07E+03	500
16-08068-7-EFF-H	Back Resin	S16T029984	Ammonia	µg/sample	105	<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 20162724

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T029866	16-07837-7-BASE-EFF	Ammonia	09/14/2016 08:45	09/14/2016 15:17
S16T029867	16-07837-7-BASE-EFF	Ammonia	09/14/2016 08:45	09/14/2016 15:40
S16T029869	16-07837-7-BASE-IN	Ammonia	09/14/2016 08:45	09/14/2016 16:03
S16T029870	16-07837-7-BASE-IN	Ammonia	09/14/2016 08:45	09/14/2016 16:26
S16T029872	16-07837-7-BLANK1	Ammonia	09/14/2016 08:45	09/14/2016 16:49
S16T029873	16-07837-7-BLANK1	Ammonia	09/14/2016 08:45	09/14/2016 17:12
S16T029875	16-07837-7-BLANK2	Ammonia	09/14/2016 08:45	09/14/2016 18:45
S16T029876	16-07837-7-BLANK2	Ammonia	09/14/2016 08:45	09/14/2016 19:08
S16T029878	16-07837-7-EFF-A	Ammonia	09/14/2016 08:45	09/14/2016 19:31
S16T029879	16-07837-7-EFF-A	Ammonia	09/14/2016 08:45	09/14/2016 19:54
S16T029881	16-07837-7-EFF-B	Ammonia	09/14/2016 08:45	09/15/2016 13:16
S16T029882	16-07837-7-EFF-B	Ammonia	09/14/2016 08:45	09/14/2016 20:41
S16T029884	16-07837-7-EFF-C	Ammonia	09/14/2016 08:45	09/15/2016 13:39
S16T029885	16-07837-7-EFF-C	Ammonia	09/14/2016 08:45	09/14/2016 21:27
S16T029887	16-07837-7-EFF-D	Ammonia	09/14/2016 08:45	09/15/2016 14:02
S16T029888	16-07837-7-EFF-D	Ammonia	09/14/2016 08:45	09/14/2016 22:13
S16T029890	16-07837-7-EFF-E	Ammonia	09/14/2016 08:45	09/15/2016 14:25
S16T029891	16-07837-7-EFF-E	Ammonia	09/14/2016 08:45	09/15/2016 00:09
S16T029893	16-07837-7-EFF-F	Ammonia	09/14/2016 08:45	09/15/2016 14:49
S16T029894	16-07837-7-EFF-F	Ammonia	09/14/2016 08:45	09/15/2016 00:55
S16T029896	16-07837-7-EFF-G	Ammonia	09/14/2016 08:45	09/15/2016 15:12
S16T029897	16-07837-7-EFF-G	Ammonia	09/14/2016 08:45	09/15/2016 04:24
S16T029899	16-07837-7-EFF-H	Ammonia	09/14/2016 08:45	09/15/2016 15:35
S16T029900	16-07837-7-EFF-H	Ammonia	09/14/2016 08:45	09/15/2016 05:10
S16T029902	16-07837-7-IN-A	Ammonia	09/14/2016 08:45	09/15/2016 15:58
S16T029903	16-07837-7-IN-A	Ammonia	09/14/2016 08:45	09/15/2016 05:56
S16T029905	16-07837-7-IN-B	Ammonia	09/14/2016 08:45	09/15/2016 17:31
S16T029906	16-07837-7-IN-B	Ammonia	09/14/2016 08:45	09/15/2016 07:52
S16T029908	16-07837-7-IN-C	Ammonia	09/14/2016 08:45	09/15/2016 17:54
S16T029909	16-07837-7-IN-C	Ammonia	09/14/2016 08:45	09/15/2016 08:38
S16T029911	16-07837-7-IN-D	Ammonia	09/14/2016 08:45	09/15/2016 18:17
S16T029912	16-07837-7-IN-D	Ammonia	09/14/2016 08:45	09/15/2016 09:25
S16T029914	16-07837-7-IN-E	Ammonia	09/14/2016 08:45	09/15/2016 18:40
S16T029915	16-07837-7-IN-E	Ammonia	09/14/2016 08:45	09/15/2016 10:11
S16T029917	16-07837-7-IN-F	Ammonia	09/14/2016 08:45	09/15/2016 19:03
S16T029918	16-07837-7-IN-F	Ammonia	09/14/2016 08:45	09/15/2016 10:57
S16T029920	16-07837-7-IN-G	Ammonia	09/14/2016 08:45	09/15/2016 19:26
S16T029921	16-07837-7-IN-G	Ammonia	09/14/2016 08:45	09/15/2016 12:53
S16T029923	16-07837-7-IN-H	Ammonia	09/14/2016 17:00	09/15/2016 16:56
S16T029924	16-07837-7-IN-H	Ammonia	09/14/2016 17:00	09/14/2016 22:32
S16T029926	16-08068-7-BASE-EFF	Ammonia	09/14/2016 17:00	09/14/2016 22:50
S16T029927	16-08068-7-BASE-EFF	Ammonia	09/14/2016 17:00	09/14/2016 23:08
S16T029929	16-08068-7-BASE-IN	Ammonia	09/14/2016 17:00	09/14/2016 23:27
S16T029930	16-08068-7-BASE-IN	Ammonia	09/14/2016 17:00	09/14/2016 23:45
S16T029932	16-08068-7-BLANK-EFF	Ammonia	09/14/2016 17:00	09/15/2016 00:57
S16T029933	16-08068-7-BLANK-EFF	Ammonia	09/14/2016 17:00	09/15/2016 01:15

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20162724

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T029935	16-08068-7-BLANK-IN	Ammonia	09/14/2016 17:00	09/15/2016 01:33
S16T029936	16-08068-7-BLANK-IN	Ammonia	09/14/2016 17:00	09/15/2016 01:51
S16T029938	16-08068-7-IN-A	Ammonia	09/14/2016 17:00	09/15/2016 17:14
S16T029939	16-08068-7-IN-A	Ammonia	09/14/2016 17:00	09/15/2016 02:27
S16T029941	16-08068-7-IN-B	Ammonia	09/14/2016 17:00	09/15/2016 17:32
S16T029942	16-08068-7-IN-B	Ammonia	09/14/2016 17:00	09/15/2016 03:04
S16T029944	16-08068-7-IN-C	Ammonia	09/14/2016 17:00	09/15/2016 17:50
S16T029945	16-08068-7-IN-C	Ammonia	09/14/2016 17:00	09/15/2016 03:40
S16T029947	16-08068-7-IN-D	Ammonia	09/14/2016 17:00	09/15/2016 18:08
S16T029948	16-08068-7-IN-D	Ammonia	09/14/2016 17:00	09/15/2016 05:10
S16T029950	16-08068-7-IN-E	Ammonia	09/14/2016 17:00	09/15/2016 18:26
S16T029951	16-08068-7-IN-E	Ammonia	09/14/2016 17:00	09/15/2016 05:46
S16T029953	16-08068-7-IN-F	Ammonia	09/14/2016 17:00	09/15/2016 22:39
S16T029954	16-08068-7-IN-F	Ammonia	09/14/2016 17:00	09/15/2016 08:29
S16T029956	16-08068-7-IN-G	Ammonia	09/15/2016 08:45	09/16/2016 19:01
S16T029957	16-08068-7-IN-G	Ammonia	09/15/2016 08:45	09/16/2016 11:29
S16T029959	16-08068-7-IN-H	Ammonia	09/14/2016 17:00	09/15/2016 23:16
S16T029960	16-08068-7-IN-H	Ammonia	09/14/2016 17:00	09/15/2016 09:42
S16T029962	16-08068-7-EFF-A	Ammonia	09/14/2016 17:00	09/15/2016 19:39
S16T029963	16-08068-7-EFF-A	Ammonia	09/14/2016 17:00	09/15/2016 19:57
S16T029965	16-08068-7-EFF-B	Ammonia	09/14/2016 17:00	09/15/2016 23:34
S16T029966	16-08068-7-EFF-B	Ammonia	09/14/2016 17:00	09/15/2016 20:15
S16T029968	16-08068-7-EFF-C	Ammonia	09/14/2016 17:00	09/15/2016 23:52
S16T029969	16-08068-7-EFF-C	Ammonia	09/14/2016 17:00	09/15/2016 20:33
S16T029971	16-08068-7-EFF-D	Ammonia	09/14/2016 17:00	09/16/2016 00:10
S16T029972	16-08068-7-EFF-D	Ammonia	09/14/2016 17:00	09/15/2016 20:51
S16T029974	16-08068-7-EFF-E	Ammonia	09/14/2016 17:00	09/15/2016 21:09
S16T029975	16-08068-7-EFF-E	Ammonia	09/14/2016 17:00	09/15/2016 21:27
S16T029977	16-08068-7-EFF-F	Ammonia	09/14/2016 17:00	09/15/2016 16:20
S16T029978	16-08068-7-EFF-F	Ammonia	09/14/2016 17:00	09/15/2016 16:38
S16T029980	16-08068-7-EFF-G	Ammonia	09/14/2016 17:00	09/15/2016 22:58
S16T029981	16-08068-7-EFF-G	Ammonia	09/14/2016 17:00	09/15/2016 09:05
S16T029983	16-08068-7-EFF-H	Ammonia	09/15/2016 08:45	09/16/2016 19:19
S16T029984	16-08068-7-EFF-H	Ammonia	09/15/2016 08:45	09/16/2016 12:05

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Attachment 3

RECEIPT PAPERWORK

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Cartridge Testing NH₃

222-S	SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST			ATS-LO-090-101 Rev DG-1
Date Samples Received: <u>9-12-16</u> Total Number of Samples: <u>478</u> Group #: <u>20162724</u>				
Sample Custodian: <u>Dianne Turner</u> IH Technician: <u>Chris Moon</u>				
Sample Custodian to Complete:				
Action	Yes	No	N/A	Comments
RSR provided?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Verify GKI is complete	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File
Received from an alpha facility?	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
Record cooler temperature in centigrade, as appropriate	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Date and time of sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Sampling location or origin	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Container type, size, and number	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Preservatives (if used) noted on the COC/RSA and sample bottles	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
• Analysis request is clear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
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>9-12-16</u>				
If No, comment on communication and resolution:				
<u>WRPS SHIP 280</u> <u>Run 118</u> <u>WHC Run 80 (40NH₃, 40H₂)</u> <u>Acetonitrile 40</u>				
<i>Broken Furan Tube</i> 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>38</u>	VOA: <u>40</u>	Other-IH: _____

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 9/16/16	
CACN: 202062	COA: CB20	Survey No.: 16-07837 - 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
	16-07837-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-07837-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-07837-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-07837-6-IN-H / Hydrar (SKC 226-17-1A) ✓	Hg-Elemental Source
• 516T029865	16-07837-7-BASE-EFF / CISA (SKC 226-29) ✓ 516T029866 29867	NH3 Source
• 516T029868	16-07837-7-BASE-IN / CISA (SKC 226-29) ✓ 516T029869 29870	NH3 Source
• 516T029871	16-07837-7-BLANK1 / CISA (SKC 226-29) ✓ 516T029872 29873	NH3 Source
• 516T029874	16-07837-7-BLANK2 / CISA (SKC 226-29) ✓ 516T029875 29876	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>Jason Reno</i>	Jason Reno	2704 - HV/4-104	9/16/16	0640
Retrieved from Storage:	<i>Christemoon</i>	Christemoon		9/12/16	1100

	Signature	Printed Name	Date	Time
Relinquished By:	<i>Christemoon</i>	Christemoon	9/12/16	1830
Received By:	<i>Sharon Wilkins</i>	Sharon Wilkins	9-12-16	1330
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: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-07837 - 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
516T029877	16-07837-7-EFF-A / CISA (SKC 226-29) ✓, 516T029878 29879	NH3 Source
516T029880	16-07837-7-EFF-B / CISA (SKC 226-29) ✓, 516T029881 29882	NH3 Source
516T029883	16-07837-7-EFF-C / CISA (SKC 226-29) ✓, 516T029884 29885	NH3 Source
516T029886	16-07837-7-EFF-D / CISA (SKC 226-29) ✓, 516T029887 29888	NH3 Source
516T029889	16-07837-7-EFF-E / CISA (SKC 226-29) ✓, 516T029890 29891	NH3 Source
516T029892	16-07837-7-EFF-F / CISA (SKC 226-29) ✓, 516T029893 29894	NH3 Source
516T029895	16-07837-7-EFF-G / CISA (SKC 226-29) ✓, 516T029896 29897	NH3 Source
516T029898	16-07837-7-EFF-H / CISA (SKC 226-29) ✓, 516T029899 29900	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>Jason Reno</i>	JASON RENO	2704-4V/H-104	9/10/16	0640
Retrieved from Storage:	<i>Christen Moon</i>	CHRISTEN MOON		9/12/16	1100

	Signature	Printed Name	Date	Time
Relinquished By:	<i>Christen Moon</i>	CHRISTEN MOON	9/12/16	1330
Received By:	<i>Sharon Lilohu</i>	Sharon Lilohu	9-12-16	1330
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: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-07837 - 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
516T029901	16-07837-7-IN-A / CISA (SKC 226-29) ✓ 516T029902 29903	NH3 Source
516T029904	16-07837-7-IN-B / CISA (SKC 226-29) ✓ 516T029905 29906	NH3 Source
516T029907	16-07837-7-IN-C / CISA (SKC 226-29) ✓ 516T029908 29909	NH3 Source
516T029910	16-07837-7-IN-D / CISA (SKC 226-29) ✓ 516T029911 029912	NH3 Source
516T029913	16-07837-7-IN-E / CISA (SKC 226-29) ✓ 516T029914 29915	NH3 Source
516T029916	16-07837-7-IN-F / CISA (SKC 226-29) ✓ 516T029917 29918	NH3 Source
516T029919	16-07837-7-IN-G / CISA (SKC 226-29) ✓ 516T029920 29921	NH3 Source
516T029922	16-07837-7-IN-H / CISA (SKC 226-29) ✓ 516T029923 29924	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Jane Reno	JANE RENO	2704-HV/H-104	9/10/16	0640
Retrieved from Storage:	Chastemoun	Chastemoun		9/12/16	1100

	Signature	Printed Name	Date	Time
Relinquished By:	C. M. M. M.	CHRISTIE MORAN	9/12/16	1330
Received By:	Sharon Libolden	Sharon Libolden	9-12-16	1330
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: 9/10/16	
CACN: 202062	COA: CB20	Survey No.: 16-08068 - Cartridge Testing	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: W/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
	16-08068-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-08068-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-08068-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
	16-08068-6-IN-H / Hydrar (SKC 226-17-1A)	Hg-Elemental Source
SI6T029925	16-08068-7-BASE-EFF / CISA (SKC 226-29) , SI6T029926 29927	NH3 Source
SI6T029928	16-08068-7-BASE-IN / CISA (SKC 226-29) , SI6T029929 29930	NH3 Source
SI6T029931	16-08068-7-BLANK-EFF / CISA (SKC 226-29) , SI6T029932 29933	NH3 Source
SI6T029934	16-08068-7-BLANK-IN / CISA (SKC 226-29) , SI6T029935 29936	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Chris Moon	Chris Moon	2704HV/H104	9/10/16	0250
Retrieved from Storage:	CMOON	Chris Moon		9/12/16	1154

	Signature	Printed Name	Date	Time
Relinquished By:	CMOON	Chris Moon	9/12/16	1330
Received By:	DIANNE TURNER	DIANNE TURNER	9-12-16	13:30
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: 9/10/16	
CACN: 202062		COA: CBAU		Survey No.: 16-08068 - 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
SI6T029937	16-08068-7-IN-A / CISA (SKC 226-29) , SI6T029938 29939	NH3 Source
SI6T029940	16-08068-7-IN-B / CISA (SKC 226-29) , SI6T029941 29942	NH3 Source
SI6T029943	16-08068-7-IN-C / CISA (SKC 226-29) , SI6T029944 29945	NH3 Source
SI6T029946	16-08068-7-IN-D / CISA (SKC 226-29) , SI6T029947 29948	NH3 Source
SI6T029949	16-08068-7-IN-E / CISA (SKC 226-29) , SI6T029950 29951	NH3 Source
SI6T029952	16-08068-7-IN-F / CISA (SKC 226-29) , SI6T029953 29954	NH3 Source
SI6T029955	16-08068-7-IN-G / CISA (SKC 226-29) , SI6T029956 29957	NH3 Source
SI6T029958	16-08068-7-IN-H / CISA (SKC 226-29) , SI6T029959 29960	NH3 Source

Special Instructions:					
	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Christie Moon	Christie Moon	2704 HU / 17104	9/10/16	09:50
Retrieved from Storage:	CMOON	Christie Moon		9/12/16	11:54

	Signature	Printed Name	Date	Time
Relinquished By:	CMOON	Christie Moon	9/12/16	1330
Received By:	DANNE TURNER	DANNE TURNER	9-12-16	13:30
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: 9/10/16	
CACN: 2020162	COA: CB20	Survey No.: 16-08068 - Cartridge Testing	
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
S16T029961	16-08068-7-EFF-A / CISA (SKC 226-29) • S16T029962 29963	NH3 Source
S16T029964	16-08068-7-EFF-B / CISA (SKC 226-29) • S16T029965 29966	NH3 Source
S16T029967	16-08068-7-EFF-C / CISA (SKC 226-29) • S16T029968 29969	NH3 Source
S16T029970	16-08068-7-EFF-D / CISA (SKC 226-29) • S16T029971 29972	NH3 Source
S16T029973	16-08068-7-EFF-E / CISA (SKC 226-29) • S16T029974 29975	NH3 Source
S16T029976	16-08068-7-EFF-F / CISA (SKC 226-29) • S16T029977 29978	NH3 Source
S16T029979	16-08068-7-EFF-G / CISA (SKC 226-29) • S16T029980 29981	NH3 Source
S16T029982	16-08068-7-EFF-H / CISA (SKC 226-29) • S16T029983 29984	NH3 Source

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	Chastemoo	Chastemoo	2704 HV/H104	9/10/16	0250
Retrieved from Storage:	Chastemoo	Chastemoo		9/12/16	1154

	Signature	Printed Name	Date	Time
Relinquished By:	Chastemoo	Chastemoo	9-12-16	1330
Received By:	Dianne Turner	Dianne Turner	9-12-16	1330
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

C.3.8 Aldehydes



ANALYTICAL REPORT Amended-20161004

Report Date: October 04, 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
20162739

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029571		Collected: 09/10/2016		
Lab ID: 1625970001		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.91	NA	NA	0.050
Acetaldehyde	4.2	NA	NA	0.050
Acetone	66	NA	NA	0.50
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	2.2	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	0.33	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	0.29	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029572		Collected: 09/10/2016		
Lab ID: 1625970002		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	4.2	NA	NA	0.050

Results Continued on Next Page

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ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029572		Collected: 09/10/2016		
Lab ID: 1625970002		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Acetone	69	NA	NA	0.50
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: S16T029573		Collected: 09/10/2016		
Lab ID: 1625970003		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	4.2	NA	NA	0.050
Acetone	71	NA	NA	0.50
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



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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029574		Collected: 09/10/2016		
Lab ID: 1625970004		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.70	NA	NA	0.050
Acetaldehyde	3.3	NA	NA	0.050
Acetone	41	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	1.8	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	1.2	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	0.054	NA	NA	0.050
Valeraldehyde	0.23	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	0.13	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029575		Collected: 09/10/2016		
Lab ID: 1625970005		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.69	NA	NA	0.050
Acetaldehyde	3.5	NA	NA	0.050
Acetone	35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	1.8	NA	NA	0.050
Crotonaldehyde	0.27	NA	NA	0.050
Butyraldehyde	1.3	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.11	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

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029575		Collected: 09/10/2016		
Lab ID: 1625970005		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029576		Collected: 09/10/2016		
Lab ID: 1625970006		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.6	NA	NA	0.050
Acetone	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: S16T029577		Collected: 09/10/2016		
Lab ID: 1625970007		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.2	NA	NA	0.050
Acetone	39	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029577		Collected: 09/10/2016		
Lab ID: 1625970007		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Method: EPA TO-11A		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029578		Collected: 09/10/2016		
Lab ID: 1625970008		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.5	NA	NA	0.050
Acetone	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



ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029579		Collected: 09/10/2016		
Lab ID: 1625970009		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	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: S16T029580		Collected: 09/10/2016		
Lab ID: 1625970010		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.057	NA	NA	0.050
Acetaldehyde	1.6	NA	NA	0.050
Acetone	0.14	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	0.052	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

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Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029580	Collected: 09/10/2016
Lab ID: 1625970010	Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050

Sample ID: S16T029581	Collected: 09/10/2016
Lab ID: 1625970011	Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (ug/sample)
Formaldehyde	<0.050
Acetaldehyde	<0.050
Acetone	<0.050
Acrolein	<0.050
Propionaldehyde	<0.050
Crotonaldehyde	<0.050
Butyraldehyde	<0.050
Benzaldehyde	<0.050
Isovaleraldehyde	<0.050
Valeraldehyde	<0.050
m-Tolualdehyde	<0.050
p-Tolualdehyde	<0.050
o-Tolualdehyde	<0.050
Hexanal	<0.050
2,5-Dimethylbenzaldehyde	<0.050

Sample ID: S16T029582	Collected: 09/10/2016
Lab ID: 1625970012	Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (ug/sample)
Formaldehyde	<0.050
Acetaldehyde	<0.050
Acetone	<0.050
Acrolein	<0.050
Propionaldehyde	<0.050

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Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029582		Collected: 09/10/2016		
Lab ID: 1625970012		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029583		Collected: 09/10/2016		
Lab ID: 1625970013		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	1.6	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



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Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029584	Sampling Location: CARTRIDGE EVALUATION			Collected: 09/10/2016
Lab ID: 1625970014				Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	6.0	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: S16T029585	Sampling Location: CARTRIDGE EVALUATION			Collected: 09/10/2016
Lab ID: 1625970015				Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	10	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

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Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029585		Collected: 09/10/2016		
Lab ID: 1625970015		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029586	Collected: 09/10/2016			
Lab ID: 1625970016	Received: 09/15/2016			
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	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
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029587			Collected: 09/10/2016	
Lab ID: 1625970017		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029587		Collected: 09/10/2016		
Lab ID: 1625970017		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029588		Collected: 09/10/2016		
Lab ID: 1625970018		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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



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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029589		Collected: 09/10/2016		
Lab ID: 1625970019		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	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: S16T029590		Collected: 09/10/2016		
Lab ID: 1625970020		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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

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Workorder: 34-1625970

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Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029590			Collected: 09/10/2016	
Lab ID: 1625970020		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029591		Sampling Location: CARTRIDGE EVALUATION		Collected: 09/10/2016
Lab ID: 1625970021				Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	1.0	NA	NA	0.050
Acetaldehyde	3.9	NA	NA	0.050
Acetone	46	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: S16T029592			Collected: 09/10/2016	
Lab ID: 1625970022		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	1.2	NA	NA	0.050
Acetaldehyde	3.9	NA	NA	0.050
Acetone	59	NA	NA	0.50
Acrolein	0.082	NA	NA	0.050
Propionaldehyde	2.1	NA	NA	0.050

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

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Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029592		Collected: 09/10/2016		
Lab ID: 1625970022		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	0.34	NA	NA	0.050
Butyraldehyde	1.3	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.10	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	0.20	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029593		Collected: 09/10/2016		
Lab ID: 1625970023		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	1.2	NA	NA	0.050
Acetaldehyde	4.3	NA	NA	0.050
Acetone	68	NA	NA	0.50
Acrolein	0.10	NA	NA	0.050
Propionaldehyde	2.2	NA	NA	0.050
Crotonaldehyde	0.36	NA	NA	0.050
Butyraldehyde	1.6	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	0.15	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	0.25	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



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Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029594		Collected: 09/10/2016		
Lab ID: 1625970024		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.9	NA	NA	0.050
Acetone	67	NA	NA	0.50
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: S16T029595		Collected: 09/10/2016		
Lab ID: 1625970025		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.51	NA	NA	0.050
Acetaldehyde	3.6	NA	NA	0.050
Acetone	60	NA	NA	0.50
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	1.7	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	1.1	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

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Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029595		Sampling Location: CARTRIDGE EVALUATION		Collected: 09/10/2016
Lab ID: 1625970025				Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029596	Sampling Location: CARTRIDGE EVALUATION			Collected: 09/10/2016
Lab ID: 1625970026				Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)			Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.5	NA	NA	0.050
Acetone	41	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: S16T029597			Collected: 09/10/2016	
Lab ID: 1625970027		Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.9	NA	NA	0.050
Acetone	34	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

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Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029597		Collected: 09/10/2016		
Lab ID: 1625970027		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Method: EPA TO-11A		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029598		Collected: 09/10/2016		
Lab ID: 1625970028		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.2	NA	NA	0.050
Acetone	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
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029599		Collected: 09/10/2016		
Lab ID: 1625970029		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.0	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: S16T029600		Collected: 09/10/2016		
Lab ID: 1625970030		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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

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ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029600		Collected: 09/10/2016		
Lab ID: 1625970030		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029601		Collected: 09/10/2016		
Lab ID: 1625970031		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	1.6	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: S16T029602		Collected: 09/10/2016		
Lab ID: 1625970032		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	2.5	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029602		Collected: 09/10/2016		
Lab ID: 1625970032		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029603		Collected: 09/10/2016		
Lab ID: 1625970033		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.1	NA	NA	0.050
Acetone	3.5	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



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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029604		Collected: 09/10/2016		
Lab ID: 1625970034		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.1	NA	NA	0.050
Acetone	3.3	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: S16T029605		Collected: 09/10/2016		
Lab ID: 1625970035		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	2.0	NA	NA	0.050
Acetone	7.4	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

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Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029605		Collected: 09/10/2016		
Lab ID: 1625970035		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T029606		Collected: 09/10/2016		
Lab ID: 1625970036		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	3.3	NA	NA	0.050
Acetone	34	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: S16T029607		Collected: 09/10/2016		
Lab ID: 1625970037		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 09/22/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029607		Collected: 09/10/2016		
Lab ID: 1625970037		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Method: EPA TO-11A		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
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: S16T029608		Collected: 09/10/2016		
Lab ID: 1625970038		Received: 09/15/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	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



ANALYTICAL REPORT
Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029609		Collected: 09/10/2016		
Lab ID: 1625970039		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	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: S16T029610		Collected: 09/10/2016		
Lab ID: 1625970040		Received: 09/15/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 09/22/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	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

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Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029610	Collected: 09/10/2016
Lab ID: 1625970040	Received: 09/15/2016
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)
Sampling Parameter: Air Volume Not Provided	
Analyte	Result (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050

Comments

Quality Control: **EPA TO-11A - (HBN: 176736)**

LMB 518404 was used to media correct LCS 518405, LCSD 518406 and field samples 001-020 for Acetaldehyde and Acetone. LMB 518407 was used to media correct LCS 518408, LCSD 518409 and field samples 021-040 for Acetaldehyde and Acetone by hand.

LCS/LCSD (518405, 518406, 518408, 518409): All of the analytes recoveries were within 20% of the target. Some analytes are outside of historical limits, but all are within general laboratory limits so no further action was taken.

Samples 001-003 and 022-025 were diluted by a factor of 10X for Acetone only. The reporting limit of 0.05 ug/Sample has been adjusted accordingly for these samples to 0.5 ug/Sample for Acetone only.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA TO-11A	/S/ Emilie Pratt 09/28/2016 14:07	/S/ Christopher Winter 09/29/2016 15:48

Laboratory Contact Information

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ANALYTICAL REPORT

Amended-20161004

Workorder: **34-1625970**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625970

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: ILC/12651 (HBN: 176736)
Analyzed By: Emilie Pratt

Blank

LMB: 518404			
Analyzed: 09/22/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	0.193	NA	0.0500
Acetone	0.273	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

LMB: 518407			
Analyzed: 09/22/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	0.172	NA	0.0500
Acetone	0.196	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



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625970

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: ILC/12651 (HBN: 176736)
Analyzed By: Emilie Pratt

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 518405 Analyzed: 09/22/2016 00:00 Dilution: 1 Units: ug/sample					LCSD: 518406 Analyzed: 09/22/2016 00:00 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	3.22	3.00	107	87.8 116.8	2.77	92.4	15.0	0.0	20.0
Acetaldehyde	3.16	3.00	105	94.7 110.5	2.74 *	91.5	14.1	0.0	20.0
Acetone	3.30	3.00	110	69.2 119.9	2.74	91.4	18.6	0.0	20.0
Acrolein	3.11	3.00	104	83.5 120.2	2.71	90.3	13.8	0.0	20.0
Propionaldehyde	3.18	3.00	106	92.2 117.2	2.78	92.5	13.7	0.0	20.0
Crotonaldehyde	3.20	3.00	107	93.1 114.8	2.79 *	93.0	13.7	0.0	20.0
Butyraldehyde	3.12	3.00	104	86.6 120.8	2.76	91.9	12.3	0.0	20.0
Benzaldehyde	3.18	3.00	106	96.0 112.3	2.77 *	92.3	13.7	0.0	20.0
Isovaleraldehyde	3.41	3.00	114	95.4 121.6	3.00	100	12.7	0.0	20.0
Valeraldehyde	3.49	3.00	116	85.3 120.4	3.04	101	13.8	0.0	20.0
m-Tolualdehyde	3.29	3.00	110	80.9 118.6	2.89	96.5	12.7	0.0	20.0
p-Tolualdehyde	3.15	3.00	105	83.5 122.2	2.68	89.2	16.2	0.0	20.0
o-Tolualdehyde	3.19	3.00	106	91.6 111.4	2.79	92.8	13.4	0.0	20.0
Hexanal	3.14	3.00	105	85.4 127.6	2.92	97.3	7.33	0.0	20.0
2,5-Dimethylbenzaldehyde	2.85	3.00 *	95.0	99.6 118.7	2.62 *	87.2	8.56	0.0	20.0

LCS: 518408 Analyzed: 09/22/2016 00:00 Dilution: 1 Units: ug/sample					LCSD: 518409 Analyzed: 09/22/2016 00:00 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.66	3.00	88.5	87.8 116.8	2.70	89.8	1.46	0.0	20.0
Acetaldehyde	2.68	3.00 *	89.5	94.7 110.5	2.75 *	91.7	2.50	0.0	20.0
Acetone	2.80	3.00	93.2	69.2 119.9	2.87	95.5	2.47	0.0	20.0
Acrolein	2.64	3.00	88.0	83.5 120.2	2.65	88.4	0.454	0.0	20.0
Propionaldehyde	2.75	3.00 *	91.7	92.2 117.2	2.76 *	92.1	0.435	0.0	20.0
Crotonaldehyde	2.74	3.00 *	91.2	93.1 114.8	2.78 *	92.7	1.70	0.0	20.0
Butyraldehyde	2.69	3.00	89.7	86.6 120.8	2.77	92.2	2.75	0.0	20.0
Benzaldehyde	2.74	3.00 *	91.2	96.0 112.3	2.79 *	92.9	1.81	0.0	20.0
Isovaleraldehyde	2.92	3.00	97.4	95.4 121.6	2.95	98.5	1.09	0.0	20.0
Valeraldehyde	2.99	3.00	99.7	85.3 120.4	3.01	100	0.633	0.0	20.0
m-Tolualdehyde	3.05	3.00	102	80.9 118.6	3.05	102	0.0328	0.0	20.0
p-Tolualdehyde	2.46	3.00 *	81.9	83.5 122.2	2.43 *	81.1	0.941	0.0	20.0
o-Tolualdehyde	2.93	3.00	97.5	91.6 111.4	2.81	93.5	4.19	0.0	20.0
Hexanal	2.94	3.00	98.1	85.4 127.6	2.83	94.3	3.99	0.0	20.0
2,5-Dimethylbenzaldehyde	2.70	3.00 *	90.0	99.6 118.7	2.55 *	84.9	5.79	0.0	20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625970

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: ILC/12651 (HBN: 176736)
Analyzed By: Emilie Pratt

Comments

LMB 518404 was used to media correct LCS 518405, LCSD 518406 and field samples 001-020 for Acetaldehyde and Acetone. LMB 518407 was used to media correct LCS 518408, LCSD 518409 and field samples 021-040 for Acetaldehyde and Acetone by hand.

LCS/LCSD (518405, 518406, 518408, 518409): All of the analytes recoveries were within 20% of the target. Some analytes are outside of historical limits, but all are within general laboratory limits so no further action was taken.

Samples 001-003 and 022-025 were diluted by a factor of 10X for Acetone only. The reporting limit of 0.05 ug/Sample has been adjusted accordingly for these samples to 0.5 ug/Sample for Acetone only.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Emilie Pratt 09/28/2016 14:07	/S/ Christopher Winter 09/29/2016 15:48

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



A-6003-962 (03/05)

Assembler				C.O.C. No. 20162739			
N/A				Page 3 of 4			
Collector				Telephone No. 773-6861			
JONES				MSIN 16-05 FAX 372-1878			
SAF No.				Purchase Order/Charge Code			
N/A				2002216201			
Project Title				Ice Chest No.			
CARRIAGE EVALUATION				WTS-033 Temp. 00.10			
Shipped To (Lab)				Bill of Lading/Air Bill No.			
ALS				772 270 4728			
Protocol				Parts and Return No.			
N/A				41310			
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
21	S16T025591	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-A	25C or 10w	
22	S16T025592	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-B	25C or 10w	
23	S16T025593	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-C	25C or 10w	
24	S16T025594	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-D	25C or 10w	
25	S16T025595	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-E	25C or 10w	
26	S16T025596	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-F	25C or 10w	
27	S16T025597	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-G	25C or 10w	
28	S16T025598	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-H	25C or 10w	
29	S16T025599	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-A	25C or 10w	
30	S16T025600	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-B	25C or 10w	
<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 Howald IV and Greg Office: howald@sl.gov and Gregory_S_Moore@sl.gov see SON for email</p> <p>Release 9 Contract # 55502 NIOSH 2016 MOD</p>							
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	
Sharon M. M... 7/14/16 0900				JA Gradisher			
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	
WRPS 7/14/16 1400				WRPS Julie Gradisher			
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	
WRPS 7/14/16 1400				FEDEX			
Relinquished By	Print	Signature	Date/Time	Received By	Print	Signature	
WRPS 7/14/16 1400				Murphy's 7/15/16			
<p>Disposal Method (e.g., Return to customer, per lab procedure, used in process)</p> <p>Disposed By: <i>Emilie Pratt</i> Date/Time: 7/14/16 14:20</p>							
<p>FINAL SAMPLE DISPOSITION</p>							

A-6003-862 (03/05)

C.3.9 1, 3-Butadiene



ANALYTICAL REPORT

Report Date: September 21, 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

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029411		Collected: 09/10/2016	
Lab ID: 1625972001		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029412		Collected: 09/10/2016	
Lab ID: 1625972002		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029413		Collected: 09/10/2016	
Lab ID: 1625972003		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029414		Collected: 09/10/2016	
Lab ID: 1625972004		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

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ALS GROUP USA, CORP. An ALS Limited Company

Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029415		Collected: 09/10/2016	
Lab ID: 1625972005		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029416		Collected: 09/10/2016	
Lab ID: 1625972006		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029417		Collected: 09/10/2016	
Lab ID: 1625972007		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029418		Collected: 09/10/2016	
Lab ID: 1625972008		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029419		Collected: 09/10/2016	
Lab ID: 1625972009		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029420		Collected: 09/10/2016	
Lab ID: 1625972010		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029421		Collected: 09/10/2016	
Lab ID: 1625972011		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029422		Collected: 09/10/2016	
Lab ID: 1625972012		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029423		Collected: 09/10/2016	
Lab ID: 1625972013		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029424		Collected: 09/10/2016	
Lab ID: 1625972014		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029425		Collected: 09/10/2016	
Lab ID: 1625972015		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029426		Collected: 09/10/2016	
Lab ID: 1625972016		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029427		Collected: 09/10/2016	
Lab ID: 1625972017		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029428		Collected: 09/10/2016	
Lab ID: 1625972018		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029429		Collected: 09/10/2016	
Lab ID: 1625972019		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029430		Collected: 09/10/2016	
Lab ID: 1625972020		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029431		Collected: 09/10/2016	
Lab ID: 1625972021		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029432		Collected: 09/10/2016	
Lab ID: 1625972022		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029433		Collected: 09/10/2016	
Lab ID: 1625972023		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029434		Collected: 09/10/2016	
Lab ID: 1625972024		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029435		Collected: 09/10/2016	
Lab ID: 1625972025		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029436		Collected: 09/10/2016	
Lab ID: 1625972026		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029437		Collected: 09/10/2016	
Lab ID: 1625972027		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029438		Collected: 09/10/2016	
Lab ID: 1625972028		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029439		Collected: 09/10/2016	
Lab ID: 1625972029		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029440		Collected: 09/10/2016	
Lab ID: 1625972030		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029441		Collected: 09/10/2016	
Lab ID: 1625972031		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029442		Collected: 09/10/2016	
Lab ID: 1625972032		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029443		Collected: 09/10/2016	
Lab ID: 1625972033		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029444		Collected: 09/10/2016	
Lab ID: 1625972034		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029445		Collected: 09/10/2016	
Lab ID: 1625972035		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029446		Collected: 09/10/2016	
Lab ID: 1625972036		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029447		Collected: 09/10/2016	
Lab ID: 1625972037		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029448		Collected: 09/10/2016	
Lab ID: 1625972038		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029449		Collected: 09/10/2016	
Lab ID: 1625972039		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029450		Collected: 09/10/2016		
Lab ID: 1625972040		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 09/21/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	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 09/21/2016 15:53	/S/ John M. Reynolds 09/21/2016 16:20

Laboratory Contact Information

ALS Environmental
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ANALYTICAL REPORT

Workorder: **34-1625972**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing; CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625972

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7770 (HBN: 176979)
Analyzed By: Fred Rejali

Blank

MB: 519101 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100
MB: 519104 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100
MB: 519107 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100
MB: 519110 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100
MB: 519113 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519102 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519103 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0259	0.0274	94.7	78.0 117.6	0.0261	95.4	0.769	0.0 20.0	
LCS: 519105 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519106 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0262	0.0274	95.8	78.0 117.6	0.0254	92.8	3.10	0.0 20.0	



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625972

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7770 (HBN: 176979)
Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519108 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519109 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0274	0.0274	100	78.0 117.6	0.0272	99.4	0.733	0.0 20.0	
LCS: 519111 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519112 Analyzed: 09/21/2016 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	0.0298	109	4.46	0.0 20.0	
LCS: 519114 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519115 Analyzed: 09/21/2016 00:00 Dilution: 1 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	

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Fred Rejali 09/21/2016 15:58	/S/ John M. Reynolds 09/21/2016 16:20

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



1625972

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20162736 Page 1 of 4	
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN 16-05 FAX 372-1878			
SAF No.	Sample Origin CARPENTER EVALUATION	Purchase Order/Charge Code 2020676520					
Project Title CARPENTER EVALUATION	Logbook/Work Package No.	Ice Chest No. WTS-033		Temp. ON ICE			
Shipped To (Lab)	Method of Shipment	Bill of Lading/Air Bill No. 1772 2770 4728					
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41310					
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative		
	S16T029411	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-BLANK1	CHILL -4C		
	S16T029412	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-BLANK1	CHILL -4C		
	S16T029413	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-BLANK2	CHILL -4C		
	S16T029414	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-BLANK2	CHILL -4C		
	S16T029415	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-A-PRT-A	CHILL -4C		
	S16T029416	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-A-PRT-B	CHILL -4C		
	S16T029417	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-B-PRT-A	CHILL -4C		
	S16T029418	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-B-PRT-B	CHILL -4C		
	S16T029419	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-C-PRT-A	CHILL -4C		
	S16T029420	VA 09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-C-PRT-B	CHILL -4C		
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No							
SPECIAL INSTRUCTIONS Send Results to Carl W. Howald IV, Carl W. Howald IV, and Greg Moore, Gregory S. Moore@ri.gov see SOW for email Reference Contract # 55502 REUSE NIOH 1024 CHILL BELOW -4 C							
Relinquished By Dianne Turner	Print JA Gradisher	Sign WRPS	Received By WRPS	Date/Time 9/14/16 0900	Date/Time 9/14/16 0900		
Relinquished By WRPS	Print WRPS	Sign WRPS	Received By WRPS	Date/Time 9/14/16 1400	Date/Time 9/14/16 1400		
Relinquished By Julie	Print Julie	Sign Julie	Received By Julie	Date/Time 9/15/16 95	Date/Time 9/15/16 95		
Disposal Method (e.g., Return to customer, per lab procedure used in process)			Disposed By Fred Rajak				
Date/Time 09/21/16			Date/Time 1600				

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)



ANALYTICAL REPORT

Report Date: September 21, 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

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029451		Collected: 09/10/2016		
Lab ID: 1625957001		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 09/21/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T029452		Collected: 09/10/2016		
Lab ID: 1625957002		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T029453		Collected: 09/10/2016		
Lab ID: 1625957003		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 09/21/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T029454		Collected: 09/10/2016		
Lab ID: 1625957004		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 09/21/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

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ALS GROUP USA, CORP. An ALS Limited Company

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www.alsglobal.com

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ANALYTICAL REPORT

Workorder: 34-1625957

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029455		Collected: 09/10/2016	
Lab ID: 1625957005		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029456		Collected: 09/10/2016	
Lab ID: 1625957006		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029457		Collected: 09/10/2016	
Lab ID: 1625957007		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029458		Collected: 09/10/2016	
Lab ID: 1625957008		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029459		Collected: 09/10/2016	
Lab ID: 1625957009		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029460		Collected: 09/10/2016	
Lab ID: 1625957010		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029461		Collected: 09/10/2016	
Lab ID: 1625957011		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029462		Collected: 09/10/2016	
Lab ID: 1625957012		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029463		Collected: 09/10/2016	
Lab ID: 1625957013		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029464		Collected: 09/10/2016	
Lab ID: 1625957014		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029465		Collected: 09/10/2016	
Lab ID: 1625957015		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029466		Collected: 09/10/2016	
Lab ID: 1625957016		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029467		Collected: 09/10/2016	
Lab ID: 1625957017		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029468		Collected: 09/10/2016	
Lab ID: 1625957018		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029469		Collected: 09/10/2016	
Lab ID: 1625957019		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029470		Collected: 09/10/2016	
Lab ID: 1625957020		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029471		Collected: 09/10/2016	
Lab ID: 1625957021		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029472		Collected: 09/10/2016	
Lab ID: 1625957022		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029473		Collected: 09/10/2016	
Lab ID: 1625957023		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029474		Collected: 09/10/2016	
Lab ID: 1625957024		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029475		Collected: 09/10/2016	
Lab ID: 1625957025		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029476		Collected: 09/10/2016	
Lab ID: 1625957026		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029477		Collected: 09/10/2016	
Lab ID: 1625957027		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029478		Collected: 09/10/2016	
Lab ID: 1625957028		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029479		Collected: 09/10/2016	
Lab ID: 1625957029		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029480		Collected: 09/10/2016	
Lab ID: 1625957030		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029481		Collected: 09/10/2016	
Lab ID: 1625957031		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029482		Collected: 09/10/2016	
Lab ID: 1625957032		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029483		Collected: 09/10/2016	
Lab ID: 1625957033		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029484		Collected: 09/10/2016	
Lab ID: 1625957034		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029485		Collected: 09/10/2016	
Lab ID: 1625957035		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029486		Collected: 09/10/2016	
Lab ID: 1625957036		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029487		Collected: 09/10/2016	
Lab ID: 1625957037		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029488		Collected: 09/10/2016	
Lab ID: 1625957038		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T029489		Collected: 09/10/2016	
Lab ID: 1625957039		Received: 09/15/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 09/21/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029490		Collected: 09/10/2016		
Lab ID: 1625957040		Received: 09/15/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 09/21/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	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 09/21/2016 15:53	/S/ John M. Reynolds 09/21/2016 16:20

Laboratory Contact Information

ALS Environmental
960 W Levoe Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alsit.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: **34-1625957**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwlabservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing; CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625957

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7770 (HBN: 176979)
Analyzed By: Fred Rejali

Blank

MB: 519101 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 519104 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 519107 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 519110 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 519113 Analyzed: 09/21/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519102 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519103 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0259	0.0274	94.7	78.0 117.6	0.0261	95.4	0.769	0.0 20.0	

LCS: 519105 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519106 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0262	0.0274	95.8	78.0 117.6	0.0254	92.8	3.10	0.0 20.0	



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625957

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7770 (HBN: 176979)
Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519108 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519109 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0274	0.0274	100	78.0 117.6	0.0272	99.4	0.733	0.0 20.0	
LCS: 519111 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519112 Analyzed: 09/21/2016 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	0.0298	109	4.46	0.0 20.0	
LCS: 519114 Analyzed: 09/21/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 519115 Analyzed: 09/21/2016 00:00 Dilution: 1 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	

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Fred Rejali 09/21/2016 15:58	/S/ John M. Reynolds 09/21/2016 16:20

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



1625957

1025957

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A		C.O.C. No. 20162745 Page 1 of 4							
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN 16-05 FAX 372-1878					
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 202662/620							
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ice Chest No. N/A		Temp ON 30C					
Shipped To (Lab) AL	Method of Shipment N/A	Bill of Lading/Air Bill No. 7772 2770 4728							
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41310							
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
	S16T029451	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-BLANK-EF-A	CHILL -4C			
	S16T029452	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-BLANK-EF-B	CHILL -4C			
	S16T029453	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-BLANK-IN-A	CHILL -4C			
	S16T029454	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-BLANK-IN-B	CHILL -4C			
	S16T029455	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-A-PRT-A	CHILL -4C			
	S16T029456	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-A-PRT-B	CHILL -4C			
	S16T029457	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-B-PRT-A	CHILL -4C			
	S16T029458	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-B-PRT-B	CHILL -4C			
	S16T029459	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-C-PRT-A	CHILL -4C			
	S16T029460	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-C-PRT-B	CHILL -4C			
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input checked="" type="radio"/> Yes <input type="radio"/> No									
SPECIAL INSTRUCTIONS Send Results to Carl W Howard IV, Carl W Howard@sl.gov, and Greg Moore, Gregory S Moore@sl.gov see SOI for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C									
Relinquished By Sharon Walker	Print JA Gradisher	Sign Sharon Walker	Date/Time 9/14/16 0900	Received By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	Main* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids	
Relinquished By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	Received By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	DL = Drum Liquids T = Tissue WM = Wipe L = Liquid V = Vegetation VA = Vapor X = Other	
Relinquished By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	Received By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	FEDEX	
Relinquished By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	Received By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	MURKIN	
Relinquished By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	Received By WRPS	Print JA Gradisher	Sign JA Gradisher	Date/Time 9/14/16 0900	MURKIN	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)									
Disposed By Fred Rajali									
Date/Time 09/12/16 1600									

A-6003-962 (03/05)

Assembler N/A		C.O.C. No. 20162745				Page 2 of 4	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN 16-05		FAX 372-1878	
SAF No. N/A	Sample Origin CERTRIDGE EVALUATION	Purchase Order/Charge Code 202062/CE20					
Project Title CERTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ice Chest No. WMS-033		Temp. ON ICE			
Shipped To (Lab) AUS	Method of Shipment	Bill of Lading/Air Bill No. 772 2770 4728					
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41310					
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative		
S16T029461	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-D-PRT-A	CHILL -4C		
S16T029462	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-D-PRT-B	CHILL -4C		
S16T029463	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-E-PRT-A	CHILL -4C		
S16T029464	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-E-PRT-B	CHILL -4C		
S16T029465	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-F-PRT-A	CHILL -4C		
S16T029466	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-F-PRT-B	CHILL -4C		
S16T029467	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-G-PRT-A	CHILL -4C		
S16T029468	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-G-PRT-B	CHILL -4C		
S16T029469	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-H-PRT-A	CHILL -4C		
S16T029470	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-H-PRT-B	CHILL -4C		
POSSIBLE SAMPLE HAZARD/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No Hold Time							
SPECIAL INSTRUCTIONS Send Results to Carl W Howard IV, Carl W Howard@rl.gov, and Greg Moore, Gregory_S_Moore@rl.gov see SOR for email Reference Contract # 55502 RELEASE NIOSH 1024 CHILL BELOW -4 C							
Relinquished By Sherrill L. Webb	Print JA Gradisher	Sign M. Webb	Date/Time 9-14-16 0900	Received By WRPS	Sign Julie Gradisher	Date/Time 9/14/16 0900	Mark* DL = Drum Liquids T = Tissue WM = Wipe L = Liquid V = Vegetation VA = Vapor X = Other
Relinquished By WRPS	Print JA Gradisher	Sign WRPS	Date/Time 9/14/16 1400	Received By FEDEX	Sign FEDEX	Date/Time 9/13/16 1400	
Relinquished By WRPS	Print WRPS	Sign WRPS	Date/Time 9/14/16 1400	Received By WRPS	Sign WRPS	Date/Time 9/14/16 1400	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Disposed By Fred Rejo			
Date/Time 9/14/16 1400				Date/Time 09/21/16 1600			

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Assembler		C.O.C. No. 20162745			
N/A		Page 4 of 4			
Collector	JONES	Contact/Requestor	CARL HOWARD IV		
SAF No.	N/A	Sample Origin	CHARCOAL TUBE		
Project Title	CHARCOAL EVALUATION	Logbook/Work Package No.	N/A		
Shipped To (Lab)	ALS	Method of Shipment	N/A		
Protocol	N/A	Data Turnaround	10 DAYS		
		Telephone No.	373-6861		
		Purchase Order/Charge Code	202062/CS20		
		Box Count No.	033		
		Bill of Lading/Air Bill No.	7772 2770 4728		
		Parts and Return No.	41310		
		Temp.	ON ICE		
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative
S16T029481	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-D-PRT-A	CHILL -4C
S16T029482	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-D-PRT-B	CHILL -4C
S16T029483	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-E-PRT-A	CHILL -4C
S16T029484	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-E-PRT-B	CHILL -4C
S16T029485	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-F-PRT-A	CHILL -4C
S16T029486	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-F-PRT-B	CHILL -4C
S16T029487	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-G-PRT-A	CHILL -4C
S16T029488	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-G-PRT-B	CHILL -4C
S16T029489	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-H-PRT-A	CHILL -4C
S16T029490	VA	09/10/16	CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-H-PRT-B	CHILL -4C
<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 W Howard IV, Carl W Howard@rl.gov, and Greg Moore, Gregory_S_Moore@rl.gov see SON for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C</p>					
Relinquished By	Print	Sign	Received By	Print	Sign
Sharon Moller	9/14/16	9/14/16	JA Gradisher	9/14/16	09/07
Relinquished By	Print	Sign	Received By	Print	Sign
WRPS	9/14/16	9/14/16	WRPS	9/14/16	09/07
Relinquished By	Print	Sign	Received By	Print	Sign
WRPS	9/14/16	9/14/16	WRPS	9/14/16	09/07
Relinquished By	Print	Sign	Received By	Print	Sign
WRPS	9/14/16	9/14/16	WRPS	9/14/16	09/07
<p>Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other</p>					
<p>FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By: Fred Rejcek Date/Time: 09/21/16 1600</p>					

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

C.3.10 Pyridines



ANALYTICAL REPORT

Report Date: September 22, 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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20162737

Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029491		Collected: 09/10/2016	
Lab ID: 1625971001		Received: 09/15/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	
		Analyzed: 09/20/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm) RL (ug/sample)
Pyridine	<0.50	NA	NA 0.50
2,4-Dimethylpyridine	<0.50	NA	NA 0.50

Sample ID: S16T029492		Collected: 09/10/2016	
Lab ID: 1625971002		Received: 09/15/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	
		Analyzed: 09/20/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm) RL (ug/sample)
Pyridine	<0.50	NA	NA 0.50
2,4-Dimethylpyridine	<0.50	NA	NA 0.50

Sample ID: S16T029493		Collected: 09/10/2016	
Lab ID: 1625971003		Received: 09/15/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	
		Analyzed: 09/20/2016	
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm) RL (ug/sample)
Pyridine	<0.50	NA	NA 0.50
2,4-Dimethylpyridine	<0.50	NA	NA 0.50

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ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029494		Collected: 09/10/2016		
Lab ID: 1625971004		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029495		Collected: 09/10/2016		
Lab ID: 1625971005		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029496		Collected: 09/10/2016		
Lab ID: 1625971006		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029497		Collected: 09/10/2016		
Lab ID: 1625971007		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029498		Collected: 09/10/2016		
Lab ID: 1625971008		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029499		Collected: 09/10/2016		
Lab ID: 1625971009		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029500		Collected: 09/10/2016		
Lab ID: 1625971010		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029501		Collected: 09/10/2016		
Lab ID: 1625971011		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029502		Collected: 09/10/2016		
Lab ID: 1625971012		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029503		Collected: 09/10/2016		
Lab ID: 1625971013		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029504		Collected: 09/10/2016		
Lab ID: 1625971014		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029505		Collected: 09/10/2016		
Lab ID: 1625971015		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029506		Collected: 09/10/2016		
Lab ID: 1625971016		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029507		Collected: 09/10/2016		
Lab ID: 1625971017		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029508		Collected: 09/10/2016		
Lab ID: 1625971018		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029509		Collected: 09/10/2016		
Lab ID: 1625971019		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/20/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029510		Collected: 09/10/2016		
Lab ID: 1625971020	Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016	
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/21/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029511		Collected: 09/10/2016		
Lab ID: 1625971021		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	0.61	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029512		Collected: 09/10/2016		
Lab ID: 1625971022		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029513		Collected: 09/10/2016		
Lab ID: 1625971023		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029514		Collected: 09/10/2016		
Lab ID: 1625971024		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	0.66	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029515		Collected: 09/10/2016		
Lab ID: 1625971025		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029516		Collected: 09/10/2016		
Lab ID: 1625971026		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029517		Collected: 09/10/2016		
Lab ID: 1625971027		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029518		Collected: 09/10/2016		
Lab ID: 1625971028		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029519		Collected: 09/10/2016		
Lab ID: 1625971029		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029520		Collected: 09/10/2016		
Lab ID: 1625971030		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029521		Collected: 09/10/2016		
Lab ID: 1625971031		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029522		Collected: 09/10/2016		
Lab ID: 1625971032	Sampling Location: CARTRIDGE EVALUATION		Received: 09/15/2016	
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 09/21/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029523		Collected: 09/10/2016		
Lab ID: 1625971033		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029524		Collected: 09/10/2016		
Lab ID: 1625971034		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/21/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029525		Collected: 09/10/2016		
Lab ID: 1625971035		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029526		Collected: 09/10/2016		
Lab ID: 1625971036		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	0.56	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029527		Collected: 09/10/2016		
Lab ID: 1625971037		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029528		Collected: 09/10/2016		
Lab ID: 1625971038		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T029529		Collected: 09/10/2016		
Lab ID: 1625971039		Received: 09/15/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 09/22/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029530				Collected: 09/10/2016
Lab ID: 1625971040	Sampling Location: CARTRIDGE EVALUATION			Received: 09/15/2016
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg			Analyzed: 09/22/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Comments

Workorder: 1625971

Report was re-issued 9.26-16 because 2 of the 4 Request Forms did not scan into the combined report.

Quality Control: NIOSH 1613 Mod. - (HBN: 176816)

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. LCS and LCSD fail slightly low for pyridine.

Quality Control: NIOSH 1613 Mod. - (HBN: 176950)

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. LCS and LCSD fail slightly low for pyridine.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
NIOSH 1613 Mod.	/S/ David Teynor 09/22/2016 12:50	/S/ Thomas J. Masoian 09/22/2016 14:28

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: **34-1625971**

Client Project ID: CARTRIDGE EVALUATION

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	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/insideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing; CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

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: 1625971

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: ISVO/3146 (HBN: 176816)
Analyzed By: David Teynor

Blank

LMB: 518626 Analyzed: 09/20/2016 10:52 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: 518627 Analyzed: 09/20/2016 11:11 Dilution: 1 Units: ug/sample					LCSD: 518628 Analyzed: 09/20/2016 11:31 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	0.562	1.00	* 56.2	61.8 141.1	0.512	* 51.2	9.42	0.0 22.1	
2,4-Dimethylpyridine	0.606	1.00	60.6	51.7 130.6	0.564	56.4	7.18	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. LCS and LCSD fail slightly low for pyridine.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ David Teynor 09/22/2016 12:39	/S/ Thomas J. Masoian 09/22/2016 14:17

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: 1625971

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: ISVO/3149 (HBN: 176950)
Analyzed By: David Teynor

Blank

LMB: 518983 Analyzed: 09/21/2016 14:22 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: 518984 Analyzed: 09/21/2016 14:41 Dilution: 1 Units: ug/sample					LCSD: 518985 Analyzed: 09/21/2016 15:01 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	0.535	1.00	* 53.5	61.8 141.1	0.586	* 58.6	9.04	0.0 22.1	
2,4-Dimethylpyridine	0.547	1.00	54.7	51.7 130.6	0.537	53.7	1.85	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. LCS and LCSD fail slightly low for pyridine.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ David Teynor 09/22/2016 12:50	/S/ Thomas J. Masoian 09/22/2016 14:28

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



1625971

Assembler
N/A

1005947

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
C.O.C. No. 20162737		Page 1 of 4		Telephone No. 373-6861 MSIN 76-05 FAX 372-1878					
Collector JONES	Contact/Requestor CARL HOWARD IV	Purchase Order/Charge Code 202062/CB20							
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Ice Chest No. 7772 27704728							
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Temp. ON ICE							
Shipped To (Lab) ALS	Method of Shipment	Bill of Lading/Air Bill No. 7772 27704728							
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41310							
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis			Preservative	
S16T029491	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-A			N/A	
S16T029492	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-B			N/A	
S16T029493	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-C			N/A	
S16T029494	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-D			N/A	
S16T029495	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-E			N/A	
S16T029496	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-F			N/A	
S16T029497	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-G			N/A	
S16T029498	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-H			N/A	
S16T029499	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-A			N/A	
S16T029500	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-B			N/A	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)									
MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No									
SPECIAL INSTRUCTIONS Send Results to Carl Howard IV and Greg Moore Carl W. Howald@rl.gov and Gregory S. Moore@rl.gov see SON for email									
RELEASE 9 Reference Contract # 55502									
Relinquished By DANIEL T. JONES	Print JA Gradisher	Sign WRPS	Date/Time 9/14/16 0900	Received By WRPS	Print Goulden	Sign 9/14/16	Date/Time 0900	Matrix* S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid WM = Wipe SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other DS = Drum Solids	
Relinquished By WRPS	Print JA Gradisher	Sign WRPS	Date/Time 9/14/16 1400	Received By WRPS	Print Goulden	Sign 9/14/16	Date/Time 1400		
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time		
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time		
Disposal Method (e.g., Return to customer, per lab procedure, used in process)								Date/Time 9/19/16 12:00	
FINAL SAMPLE DISPOSITION								Disposed By CONSUMED	

A-6003-962 (03/05)

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		C.O.C. No. 20162737 Page 3 of 4	
Assembler N/A		Telephone No 373-6861 MSIN T6-05 FAX 372-1878	
Collector JONES N/A		Contact/Requestor CARL HOWARD IV	
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION	
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A	
Shipped To (Lab) ALS		Method of Shipment N/A	
Protocol N/A		Data Turnaround 10 DAYS	
Ice Chest No. 475-033 Temp. 010 ICE		Bill of Lading/Air Bill No. 7772 270 4728	
Parts and Return No. 41310		Preservative N/A	

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T029511	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-A	N/A
	S16T029512	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-B	N/A
	S16T029513	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-C	N/A
	S16T029514	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-D	N/A
	S16T029515	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-E	N/A
	S16T029516	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-F	N/A
	S16T029517	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-G	N/A
	S16T029518	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-H	N/A
	S16T029519	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-A	N/A
	S16T029520	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-B	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No			
SPECIAL INSTRUCTIONS Send Results to Carl Howard IV and Greg Moore Carl W Howard@rl.gov and Gregory S Moore@rl.gov see SOW for email RELEASE 9 Reference Contract # 55502			
Relinquished By Print Signature Relinquished By Signature Relinquished By Signature	Received By JA Gradisher WRPS Received By Signature Received By Signature	Date/Time 9/14/16 0900 Date/Time 9/14/16 1400 Date/Time 9/14/16 1400	Date/Time 9/14/16 0900 Date/Time 9/14/16 1400 Date/Time 9/14/16 1400

Relinquished By Signature Relinquished By Signature	Received By Signature Received By Signature	Date/Time 9/14/16 1400 Date/Time 9/14/16 1400	Date/Time 9/14/16 1400 Date/Time 9/14/16 1400
--	--	--	--

Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By CONSUMED	Date/Time 9/14/16 12:00
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A-8003-982 (03/05)

C.3.11 Nitrosamines

W609056 Rev. 2, Page 1 of 37



RJ LeeGroup, Inc. | Columbia Basin Analytical Laboratories
2710 North 20th Avenue, Pasco WA 99301
Tel: (509) 545-4989 | Fax: (509) 544-6010

Carl Howald IV

11/18/16

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 20162738

Enclosed is the final report for group 20162738 number analyzed for Nitrosamines using NIOSH 2522-Modified. This group number 20162738 has been assigned a Columbia Basin Analytical Laboratories login order number of W609056. 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 09/14/16 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.

This report is being issued upon request of the client for presentation of data in a newly agreed upon format. The data reported herein supersedes previously reported data for this work order, W609056.

**- 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.

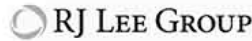
SampleName	RJLG ID	Analyzed	Analyte	Results	RL	Units	Flags
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	
16-07837-12-BASE-EFF	W609056-01	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	

Columbia Basin Analytical Laboratories | 2710 North 20th Avenue, Pasco WA 99301 | 509.545.4989

WWW.RJLEEGROUP.COM

Report Template: WRPS_Nitrosamines 2.0.rpt

Approved: 10/27/16 17:59
Report Time Stamp: 11/18/16 15:27



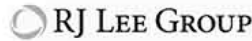
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-BASE-IN	W609056-02	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-BLANK1	W609056-03	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-BLANK2	W609056-04	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-A	W609056-05	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-B	W609056-06	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-C	W609056-07	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube

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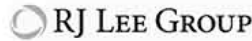
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-D	W609056-08	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-E	W609056-09	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-F	W609056-10	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-G	W609056-11	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube
16-07837-12-EFF-H	W609056-12	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube
16-07837-12-IN-A	W609056-13	10/05/16	N-Nitrosodimethylamine	1.481	0.152	µg/tube D
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosodi-n-butylamine	0.086	0.019	µg/tube
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosodi-n-propylamine	0.026	0.020	µg/tube X
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosomethylethylamine	0.034	0.021	µg/tube
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosomorpholine	0.067	0.021	µg/tube
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosopiperidine	0.024	0.021	µg/tube
16-07837-12-IN-A	W609056-13	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube *
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube

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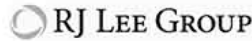
16-07837-12-IN-B	W609056-14	10/04/16	N-Nitrosodimethylamine	1.742	0.152	µg/tube	D
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosodi-n-butylamine	0.102	0.019	µg/tube	
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosodi-n-propylamine	0.022	0.020	µg/tube	X
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosomethylethylamine	0.037	0.021	µg/tube	
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosomorpholine	0.062	0.021	µg/tube	
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosopiperidine	0.030	0.021	µg/tube	
16-07837-12-IN-B	W609056-14	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-C	W609056-15	10/05/16	N-Nitrosodimethylamine	1.637	0.152	µg/tube	D
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosodi-n-butylamine	0.084	0.019	µg/tube	
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosomethylethylamine	0.034	0.021	µg/tube	
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosomorpholine	0.054	0.021	µg/tube	
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosopiperidine	0.023	0.021	µg/tube	
16-07837-12-IN-C	W609056-15	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-D	W609056-16	10/04/16	N-Nitrosodimethylamine	1.417	0.152	µg/tube	D
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosodi-n-butylamine	0.067	0.019	µg/tube	
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosomethylethylamine	0.022	0.021	µg/tube	X
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosomorpholine	0.060	0.021	µg/tube	
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-E	W609056-17	10/04/16	N-Nitrosodimethylamine	1.164	0.152	µg/tube	D
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosodi-n-butylamine	0.075	0.019	µg/tube	
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosomorpholine	0.052	0.021	µg/tube	
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-E	W609056-17	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-F	W609056-18	10/04/16	N-Nitrosodimethylamine	1.334	0.152	µg/tube	D
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosodi-n-butylamine	0.066	0.019	µg/tube	
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosomorpholine	0.031	0.021	µg/tube	
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosopiperidine	0.025	0.021	µg/tube	X
16-07837-12-IN-F	W609056-18	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-G	W609056-19	10/05/16	N-Nitrosodimethylamine	1.121	0.152	µg/tube	D
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosodi-n-butylamine	0.061	0.019	µg/tube	
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	*
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-G	W609056-19	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	µg/tube	

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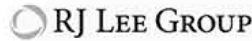
16-07837-12-IN-H	W609056-20	10/04/16	N-Nitrosodimethylamine	0.900	0.152	µg/tube	D
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosodi-n-butylamine	0.043	0.019	µg/tube	X
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosodi-n-propylamine	0.025	0.020	µg/tube	X
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	µg/tube	
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosomorpholine	<0.021	0.021	µg/tube	*
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosopiperidine	<0.021	0.021	µg/tube	*
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	µg/tube	*
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-BASE-EFF	W609056-21	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	*
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosodi-n-propylamine	0.027	0.020	µg/tube	X
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	*
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-BASE-IN	W609056-22	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-EFF	W609056-23	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-BLANK-IN	W609056-24	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-EFF-A	W609056-25	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	

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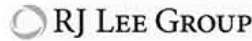
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-B	W609056-26	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-C	W609056-27	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-D	W609056-28	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-E	W609056-29	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-F	W609056-30	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-08068-12-EFF-G	W609056-31	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube

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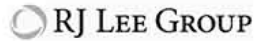
16-08068-12-EFF-H	W609056-32	10/05/16	N-Nitrosodimethylamine	1.333	0.156	µg/tube	D
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosodi-n-butylamine	0.091	0.020	µg/tube	
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosomethylethylamine	0.019	0.019	µg/tube	X
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosomorpholine	0.051	0.020	µg/tube	
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	*
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosodimethylamine	0.991	0.156	µg/tube	D
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosodi-n-butylamine	0.221	0.020	µg/tube	
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosodi-n-propylamine	0.042	0.020	µg/tube	X
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosomorpholine	0.090	0.020	µg/tube	
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosopiperidine	0.045	0.020	µg/tube	
16-08068-12-IN-A	W609056-33	10/04/16	N-Nitrosopyrrolidine	0.026	0.020	µg/tube	
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-B	W609056-34	10/05/16	N-Nitrosodimethylamine	1.511	0.156	µg/tube	D
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosodi-n-butylamine	0.175	0.020	µg/tube	
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosodi-n-propylamine	0.026	0.020	µg/tube	X
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosomethylethylamine	0.034	0.019	µg/tube	
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosomorpholine	0.058	0.020	µg/tube	
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosopiperidine	0.023	0.020	µg/tube	
16-08068-12-IN-B	W609056-34	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosodimethylamine	1.645	0.156	µg/tube	D
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosodi-n-butylamine	0.190	0.020	µg/tube	
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosodi-n-propylamine	0.030	0.020	µg/tube	X
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosomethylethylamine	0.035	0.019	µg/tube	
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosomorpholine	0.055	0.020	µg/tube	
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosopiperidine	0.040	0.020	µg/tube	
16-08068-12-IN-C	W609056-35	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-D	W609056-36	10/05/16	N-Nitrosodimethylamine	1.767	0.156	µg/tube	D
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosodi-n-butylamine	0.131	0.020	µg/tube	
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosodi-n-propylamine	0.039	0.020	µg/tube	X
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosomethylethylamine	0.035	0.019	µg/tube	
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosomorpholine	0.062	0.020	µg/tube	
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosopiperidine	0.023	0.020	µg/tube	
16-08068-12-IN-D	W609056-36	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-E	W609056-37	10/05/16	N-Nitrosodimethylamine	1.593	0.156	µg/tube	D
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosodi-n-butylamine	0.098	0.020	µg/tube	
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosomethylethylamine	0.030	0.019	µg/tube	
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosomorpholine	0.035	0.020	µg/tube	
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosopiperidine	0.021	0.020	µg/tube	
16-08068-12-IN-E	W609056-37	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	

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16-08068-12-IN-F	W609056-38	10/05/16	N-Nitrosodimethylamine	1.275	0.156	µg/tube	D
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosodi-n-butylamine	0.076	0.020	µg/tube	
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosomethylethylamine	0.024	0.019	µg/tube	
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosomorpholine	0.036	0.020	µg/tube	
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-F	W609056-38	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-G	W609056-39	10/05/16	N-Nitrosodimethylamine	1.198	0.156	µg/tube	D
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosodi-n-butylamine	0.080	0.020	µg/tube	
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosomethylethylamine	0.019	0.019	µg/tube	X
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosomorpholine	0.031	0.020	µg/tube	
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-G	W609056-39	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube	*
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube	
16-08068-12-IN-H	W609056-40	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	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

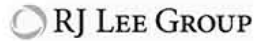
There were no RSD failures between the laboratory control samples.

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

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.

A handwritten signature in black ink, appearing to read 'DeNomy Dage', written over a horizontal line.

11/18/16

Scientist II DeNomy Dage

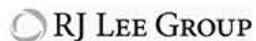
If you have any questions, please feel free to contact DeNomy Dage at ddage@rjlg.com or at 509-545-4989.

This report has been reviewed and approved by the following individual:

A handwritten signature in black ink, appearing to read 'Fernanda Pincheira', written over a horizontal line.

11/18/16

Scientist I Fernanda Pincheira



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.: W609056
Samples Received: 09/14/16
Report Date: 11/18/16
COC No.: 20162738
Extraction Date: 09/21/16

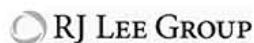
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-BASE-EFF | S16T029531	W609056-01	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-BASE-IN | S16T029532	W609056-02	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-BASE-IN S16T029532	W609056-02	09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	

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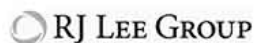
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-07837-12-BLANK1 | S16T029533	W609056-03	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-BLANK2 | S16T029534	W609056-04	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-EFF-A | S16T029535	W609056-05	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	

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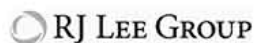
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		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-EFF-C | S16T029537	W609056-07	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
16-07837-12-EFF-D | S16T029538	W609056-08	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	

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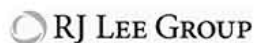
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		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	
16-07837-12-EFF-F | S16T029540	W609056-10	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	
16-07837-12-EFF-G | S16T029541	W609056-11	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	

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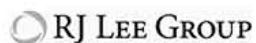
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Client Sample ID	RJLG ID						
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		09/10/16	10/02/16	N-Nitrosodimethylamine	<0.022	0.022	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	<0.019	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	
16-07837-12-IN-A | S16T029543	W609056-13	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.072	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.409	0.152	D
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.086	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	0.026	0.020	X
		09/10/16	10/02/16	N-Nitrosomethylethylamine	0.034	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	0.067	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	0.024	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*

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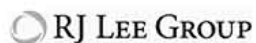
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Client Sample ID	RJLG ID						
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		09/10/16	10/05/16	N-Nitrosodimethylamine	1.641	0.152	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.100	0.018	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.102	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	0.022	0.020	X
		09/10/16	10/02/16	N-Nitrosomethylethylamine	0.037	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	0.062	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	0.030	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*
16-07837-12-IN-C | S16T029545	W609056-15	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.110	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.527	0.152	D
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.084	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	0.034	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	0.054	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	0.023	0.021	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*

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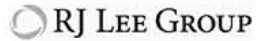
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		09/10/16	10/05/16	N-Nitrosodimethylamine	1.302	0.152	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.115	0.018	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.067	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	0.022	0.021	X
		09/10/16	10/02/16	N-Nitrosomorpholine	0.060	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*
16-07837-12-IN-E | S16T029547	W609056-17	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.076	0.152	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.088	0.018	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.075	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	0.052	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*

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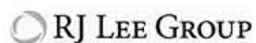
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		09/10/16	10/05/16	N-Nitrosodimethylamine	1.217	0.152	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.116	0.018	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.066	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	0.031	0.021	
		09/10/16	10/02/16	N-Nitrosopiperidine	0.025	0.021	X
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*
16-07837-12-IN-G | S16T029549	W609056-19	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.075	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.047	0.152	D
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.061	0.019	
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*

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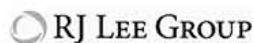
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		09/10/16	10/05/16	N-Nitrosodimethylamine	0.835	0.152	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.066	0.018	
		09/10/16	10/02/16	N-Nitrosodi-n-butylamine	0.043	0.019	X
		09/10/16	10/02/16	N-Nitrosodi-n-propylamine	0.025	0.020	X
		09/10/16	10/02/16	N-Nitrosomethylethylamine	<0.021	0.021	
		09/10/16	10/02/16	N-Nitrosomorpholine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopiperidine	<0.021	0.021	*
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	*
16-08068-12-BASE-EFF | S16T029551	W609056-21	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	

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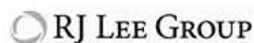
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		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	*
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	0.027	0.020	X
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	*
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
16-08068-12-BLANK-EFF | S16T029553	W609056-23	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
16-08068-12-BLANK-IN | S16T029554	W609056-24	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	

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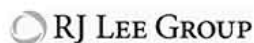
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		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
16-08068-12-EFF-B | S16T029556	W609056-26	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
16-08068-12-EFF-C | S16T029557	W609056-27	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	

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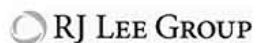
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-EFF-D | S16T029558	| W609056-28	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
16-08068-12-EFF-E | S16T029559	| W609056-29	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
16-08068-12-EFF-F | S16T029560	| W609056-30	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	

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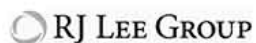
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-EFF-G | S16T029561	| W609056-31	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
16-08068-12-EFF-H | S16T029562	| W609056-32	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.101	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.232	0.156	D
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.091	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.019	0.019	X
		09/10/16	10/04/16	N-Nitrosomorpholine	0.051	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	*
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	*

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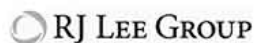
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-IN-A | S16T029563	W609056-33	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	0.910	0.156	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.081	0.018	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.221	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	0.042	0.020	X
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.090	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	0.045	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	0.026	0.020	
16-08068-12-IN-B | S16T029564	W609056-34	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.083	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.427	0.156	D
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.175	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	0.026	0.020	X
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.034	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.058	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	0.023	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	*

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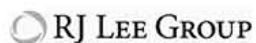
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-IN-C | S16T029565	| W609056-35	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.572	0.156	D
		09/10/16	10/04/16	N-Nitrosodimethylamine	0.073	0.018	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.190	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	0.030	0.020	X
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.035	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.055	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	0.040	0.020	
16-08068-12-IN-D | S16T029566	| W609056-36	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.690	0.156	D
		09/10/16	10/05/16	N-Nitrosodimethylamine	0.076	0.018	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.131	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	0.039	0.020	X
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.035	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.062	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	0.023	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	*

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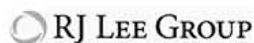
Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-IN-E | S16T029567	W609056-37	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	0.097	0.018	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.496	0.156	D
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.098	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.030	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.035	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	0.021	0.020	
16-08068-12-IN-F | S16T029568	W609056-38	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.181	0.156	D
		09/10/16	10/05/16	N-Nitrosodimethylamine	0.094	0.018	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.076	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.024	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	0.036	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	*
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	*

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Sample Identification		Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
Client Sample ID	RJLG ID						
16-08068-12-IN-G | S16T029569	W609056-39	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	1.119	0.156	D
		09/10/16	10/05/16	N-Nitrosodimethylamine	0.079	0.018	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	0.080	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	0.019	0.019	X
		09/10/16	10/04/16	N-Nitrosomorpholine	0.031	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	*
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	*
16-08068-12-IN-H | S16T029570	W609056-40	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	
		09/10/16	10/04/16	N-Nitrosomorpholine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopiperidine	<0.020	0.020	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	

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

I = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, rsd >80% w/ 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

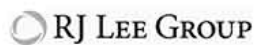
ND = Not Detected

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A handwritten signature in black ink, appearing to read 'DeNomy Dage', written over a light gray background.

Scientist II DeNomy Dage

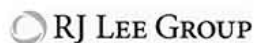
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Carl Howald IV
Washington River Protection
Solutions, LLC
P.O. Box 850 MSIN H6-16
Richland, WA 99352

Quality Control

NIOSH 2522

RJ Lee Group No.: W609056
Samples Received: 09/14/16
Report Date: 11/18/16
COC No.: 20162738
Extraction Date: 09/21/16

Client Project:
Cartridge Evaluation

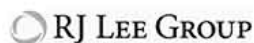
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	LCS-1	10/01/16	0.200	0.183	0.97	0.188	93.9	5.30	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/04/16	0.200	0.197	1.02	0.194	96.8	2.96	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/04/16	0.200	0.180	0.88	0.204	102	2.12	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/05/16	0.200	0.192	1.00	0.192	95.6	4.91	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/05/16	0.200	0.200	1.02	0.197	98.3	2.63	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/01/16	0.200	0.173	0.92	0.188	94.3	4.96	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/04/16	0.200	0.189	0.99	0.191	95.6	4.18	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/04/16	0.200	0.183	0.89	0.206	103	3.01	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/05/16	0.200	0.184	0.99	0.186	93.2	5.87	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/05/16	0.200	0.196	1.01	0.194	97.1	2.91	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/01/16	0.200	0.195	1.03	0.190	94.7	4.78	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/04/16	0.200	0.198	1.01	0.197	98.4	2.12	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/04/16	0.200	0.172	0.84	0.204	102	2.69	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/05/16	0.200	0.185	0.96	0.192	96.0	3.95	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/05/16	0.200	0.192	0.98	0.196	97.9	1.87	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/01/16	0.200	0.190	1.00	0.190	95.2	4.14	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/04/16	0.200	0.198	1.02	0.195	97.3	2.48	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/04/16	0.200	0.173	0.84	0.205	102	2.69	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/05/16	0.200	0.188	0.98	0.193	96.4	4.11	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/05/16	0.200	0.192	0.98	0.196	98.0	2.49	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/01/16	0.200	0.184	0.97	0.190	94.5	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/04/16	0.200	0.197	1.03	0.192	95.9	3.80	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/04/16	0.200	0.181	0.88	0.206	103	2.65	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/05/16	0.200	0.191	0.99	0.192	95.6	4.23	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/05/16	0.200	0.196	1.02	0.193	96.6	3.64	
N-Nitrosomorpholine	59-89-2	LCS-1	10/01/16	0.200	0.184	0.97	0.190	95.1	4.25	
N-Nitrosomorpholine	59-89-2	LCS-1	10/04/16	0.200	0.199	1.01	0.197	98.2	2.97	
N-Nitrosomorpholine	59-89-2	LCS-1	10/04/16	0.200	0.178	0.86	0.207	103	2.57	
N-Nitrosomorpholine	59-89-2	LCS-1	10/05/16	0.200	0.186	0.98	0.190	94.7	4.64	
N-Nitrosomorpholine	59-89-2	LCS-1	10/05/16	0.200	0.191	0.98	0.196	97.5	2.36	
N-Nitrosopiperidine	100-75-4	LCS-1	10/01/16	0.200	0.183	0.96	0.191	95.4	3.98	
N-Nitrosopiperidine	100-75-4	LCS-1	10/04/16	0.200	0.193	0.99	0.195	97.4	2.40	

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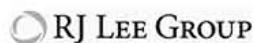
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopiperidine	100-75-4	LCS-1	10/04/16	0.200	0.175	0.84	0.207	103	3.45	
N-Nitrosopiperidine	100-75-4	LCS-1	10/05/16	0.200	0.182	0.95	0.192	96.0	4.31	
N-Nitrosopiperidine	100-75-4	LCS-1	10/05/16	0.200	0.190	0.96	0.197	98.4	2.38	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/01/16	0.200	0.173	0.93	0.186	92.5	6.53	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/04/16	0.200	0.188	0.98	0.191	95.7	3.98	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/04/16	0.200	0.171	0.82	0.208	104	3.63	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/05/16	0.200	0.176	0.93	0.189	94.3	5.16	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/05/16	0.200	0.181	0.94	0.193	96.4	3.77	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/01/16	0.200	0.200	0.97	0.206	103	5.30	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/04/16	0.200	0.209	1.02	0.206	103	2.96	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/04/16	0.200	0.177	0.88	0.201	100	2.12	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/05/16	0.200	0.199	1.00	0.199	99.2	4.91	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/05/16	0.200	0.210	1.02	0.207	103	2.63	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/01/16	0.200	0.190	0.92	0.207	104	4.96	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/04/16	0.200	0.206	0.99	0.208	104	4.18	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/04/16	0.200	0.178	0.89	0.200	100	3.01	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/05/16	0.200	0.204	0.99	0.207	103	5.87	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/05/16	0.200	0.208	1.01	0.206	103	2.91	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/01/16	0.200	0.209	1.03	0.203	101	4.78	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/04/16	0.200	0.207	1.01	0.206	102	2.12	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/04/16	0.200	0.170	0.84	0.202	101	2.69	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/05/16	0.200	0.193	0.96	0.201	100	3.95	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/05/16	0.200	0.200	0.98	0.204	102	1.87	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/01/16	0.200	0.204	1.00	0.204	102	4.14	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/04/16	0.200	0.208	1.02	0.205	102	2.48	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/04/16	0.200	0.170	0.84	0.202	101	2.69	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/05/16	0.200	0.194	0.98	0.199	99.2	4.11	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/05/16	0.200	0.201	0.98	0.206	103	2.49	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/01/16	0.200	0.197	0.97	0.203	101	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/04/16	0.200	0.213	1.03	0.207	103	3.80	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/04/16	0.200	0.176	0.88	0.201	100.0	2.65	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/05/16	0.200	0.200	0.99	0.201	100	4.23	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/05/16	0.200	0.211	1.02	0.208	104	3.64	
N-Nitrosomorpholine	59-89-2	LCS-2	10/01/16	0.200	0.199	0.97	0.206	103	4.25	
N-Nitrosomorpholine	59-89-2	LCS-2	10/04/16	0.200	0.210	1.01	0.208	103	2.97	
N-Nitrosomorpholine	59-89-2	LCS-2	10/04/16	0.200	0.171	0.86	0.198	98.9	2.57	
N-Nitrosomorpholine	59-89-2	LCS-2	10/05/16	0.200	0.200	0.98	0.204	102	4.64	
N-Nitrosomorpholine	59-89-2	LCS-2	10/05/16	0.200	0.200	0.98	0.205	102	2.36	
N-Nitrosopiperidine	100-75-4	LCS-2	10/01/16	0.200	0.196	0.96	0.205	102	3.98	

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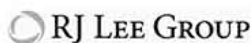
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopiperidine	100-75-4	LCS-2	10/04/16	0.200	0.202	0.99	0.204	102	2.40	
N-Nitrosopiperidine	100-75-4	LCS-2	10/04/16	0.200	0.169	0.84	0.200	99.9	3.45	
N-Nitrosopiperidine	100-75-4	LCS-2	10/05/16	0.200	0.189	0.95	0.199	99.5	4.31	
N-Nitrosopiperidine	100-75-4	LCS-2	10/05/16	0.200	0.198	0.96	0.206	103	2.38	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/01/16	0.200	0.192	0.93	0.206	103	6.53	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/04/16	0.200	0.204	0.98	0.207	104	3.98	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/04/16	0.200	0.164	0.82	0.199	99.4	3.63	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/05/16	0.200	0.189	0.93	0.203	101	5.16	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/05/16	0.200	0.195	0.94	0.208	104	3.77	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/02/16	0.200	0.201	0.97	0.207	103	5.30	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/04/16	0.200	0.205	1.02	0.202	101	2.96	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/04/16	0.200	0.172	0.88	0.195	97.7	2.12	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/05/16	0.200	0.211	1.00	0.211	105	4.91	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/05/16	0.200	0.201	1.02	0.198	98.6	2.63	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/02/16	0.200	0.188	0.92	0.205	102	4.96	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/04/16	0.200	0.199	0.99	0.201	100	4.18	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/04/16	0.200	0.172	0.89	0.194	96.9	3.01	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/05/16	0.200	0.205	0.99	0.208	104	5.87	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/05/16	0.200	0.202	1.01	0.200	100.0	2.91	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/02/16	0.200	0.214	1.03	0.208	104	4.78	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/04/16	0.200	0.200	1.01	0.199	99.2	2.12	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/04/16	0.200	0.164	0.84	0.195	97.0	2.69	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/05/16	0.200	0.200	0.96	0.208	104	3.95	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/05/16	0.200	0.198	0.98	0.202	100	1.87	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/02/16	0.200	0.205	1.00	0.205	103	4.14	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/04/16	0.200	0.205	1.02	0.202	101	2.48	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/04/16	0.200	0.164	0.84	0.195	97.1	2.69	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/05/16	0.200	0.204	0.98	0.209	104	4.11	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/05/16	0.200	0.194	0.98	0.198	99.2	2.49	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/02/16	0.200	0.202	0.97	0.208	104	4.91	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/04/16	0.200	0.207	1.03	0.202	101	3.80	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/04/16	0.200	0.171	0.88	0.195	97.4	2.65	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/05/16	0.200	0.207	0.99	0.208	104	4.23	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/05/16	0.200	0.203	1.02	0.200	99.6	3.64	
N-Nitrosomorpholine	59-89-2	LCS-3	10/02/16	0.200	0.198	0.97	0.205	102	4.25	
N-Nitrosomorpholine	59-89-2	LCS-3	10/04/16	0.200	0.199	1.01	0.197	98.4	2.97	
N-Nitrosomorpholine	59-89-2	LCS-3	10/04/16	0.200	0.169	0.86	0.196	98.2	2.57	
N-Nitrosomorpholine	59-89-2	LCS-3	10/05/16	0.200	0.203	0.98	0.207	104	4.64	
N-Nitrosomorpholine	59-89-2	LCS-3	10/05/16	0.200	0.196	0.98	0.201	100	2.36	

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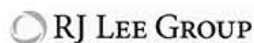
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopiperidine	100-75-4	LCS-3	10/02/16	0.200	0.196	0.96	0.205	102	3.98	
N-Nitrosopiperidine	100-75-4	LCS-3	10/04/16	0.200	0.199	0.99	0.201	100	2.40	
N-Nitrosopiperidine	100-75-4	LCS-3	10/04/16	0.200	0.163	0.84	0.193	96.6	3.45	
N-Nitrosopiperidine	100-75-4	LCS-3	10/05/16	0.200	0.199	0.95	0.210	105	4.31	
N-Nitrosopiperidine	100-75-4	LCS-3	10/05/16	0.200	0.191	0.96	0.198	98.9	2.38	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/02/16	0.200	0.195	0.93	0.209	105	6.53	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/04/16	0.200	0.198	0.98	0.201	101	3.98	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/04/16	0.200	0.159	0.82	0.193	96.7	3.63	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/05/16	0.200	0.194	0.93	0.209	104	5.16	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/05/16	0.200	0.187	0.94	0.200	99.7	3.77	
N-Nitrosodiethylamine	55-18-5	MB	10/02/16		0.00	0.97	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/04/16		0.00	1.02	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/04/16		0.00	0.88	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/05/16		0.00	1.00	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/05/16		0.00	1.02	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/02/16		0.00	0.92	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/04/16		0.00	0.99	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/04/16		0.00	0.89	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/05/16		0.00	0.99	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/05/16		0.00	1.01	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/02/16		0.00	1.03	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/04/16		0.00	1.01	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/04/16		0.00	0.84	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/05/16		0.00	0.96	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/05/16		0.00	0.98	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/02/16		0.00	1.00	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/04/16		0.00	1.02	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/04/16		0.00	0.84	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/05/16		0.00	0.98	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/05/16		0.00	0.98	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/02/16		0.00	0.97	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/04/16		0.00	1.03	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/04/16		0.00	0.88	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/05/16		0.00	0.99	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/05/16		0.00	1.02	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/02/16		0.00	0.97	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/04/16		0.00	1.01	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/04/16		0.00	0.86	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/05/16		0.00	0.98	0.00			

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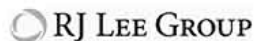
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	MB	10/05/16		0.00	0.98	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/02/16		0.00	0.96	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/04/16		0.00	0.99	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/04/16		0.00	0.84	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/05/16		0.00	0.95	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/05/16		0.00	0.96	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/02/16		0.00	0.93	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/04/16		0.00	0.98	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/04/16		0.00	0.82	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/05/16		0.00	0.93	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/05/16		0.00	0.94	0.00			
N-Nitrosodiethylamine	55-18-5	MRL	10/02/16	0.020	0.019	0.97	0.020	98.1		
N-Nitrosodiethylamine	55-18-5	MRL	10/04/16	0.020	0.020	1.02	0.020	97.8		
N-Nitrosodiethylamine	55-18-5	MRL	10/04/16	0.020	0.021	0.88	0.024	120		
N-Nitrosodiethylamine	55-18-5	MRL	10/05/16	0.020	0.021	1.00	0.021	106		
N-Nitrosodiethylamine	55-18-5	MRL	10/05/16	0.020	0.020	1.02	0.020	99.8		
N-Nitrosodimethylamine	62-75-9	MRL	10/02/16	0.020	0.021	0.92	0.023	114		
N-Nitrosodimethylamine	62-75-9	MRL	10/04/16	0.020	0.023	0.99	0.023	116		
N-Nitrosodimethylamine	62-75-9	MRL	10/04/16	0.020	0.023	0.89	0.026	131		
N-Nitrosodimethylamine	62-75-9	MRL	10/05/16	0.020	0.022	0.99	0.022	109		
N-Nitrosodimethylamine	62-75-9	MRL	10/05/16	0.020	0.022	1.01	0.022	112		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/02/16	0.020	0.020	1.03	0.019	96.5		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/04/16	0.020	0.021	1.01	0.021	104		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/04/16	0.020	0.022	0.84	0.026	129		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/05/16	0.020	0.020	0.96	0.021	104		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/05/16	0.020	0.022	0.98	0.022	108		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/02/16	0.020	0.020	1.00	0.020	102		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/04/16	0.020	0.018	1.02	0.018	89.1		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/04/16	0.020	0.021	0.84	0.025	124		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/05/16	0.020	0.021	0.98	0.022	108		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/05/16	0.020	0.021	0.98	0.021	105		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/02/16	0.020	0.020	0.97	0.021	103		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/04/16	0.020	0.022	1.03	0.021	103		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/04/16	0.020	0.021	0.88	0.024	121		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/05/16	0.020	0.020	0.99	0.020	99.0		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/05/16	0.020	0.020	1.02	0.020	102		
N-Nitrosomorpholine	59-89-2	MRL	10/02/16	0.020	0.018	0.97	0.019	96.7		
N-Nitrosomorpholine	59-89-2	MRL	10/04/16	0.020	0.020	1.01	0.020	97.8		
N-Nitrosomorpholine	59-89-2	MRL	10/04/16	0.020	0.021	0.86	0.024	122		

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Report Template: WRPS_Nitrosamines 2.0.rpt

 Approved: 10/27/16 17:59
 Report Time Stamp: 11/18/16 15:27



Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	MRL	10/05/16	0.020	0.021	0.98	0.021	104		
N-Nitrosomorpholine	59-89-2	MRL	10/05/16	0.020	0.021	0.98	0.022	109		
N-Nitrosopiperidine	100-75-4	MRL	10/02/16	0.020	0.019	0.96	0.020	98.5		
N-Nitrosopiperidine	100-75-4	MRL	10/04/16	0.020	0.020	0.99	0.020	99.2		
N-Nitrosopiperidine	100-75-4	MRL	10/04/16	0.020	0.022	0.84	0.026	128		
N-Nitrosopiperidine	100-75-4	MRL	10/05/16	0.020	0.021	0.95	0.022	110		
N-Nitrosopiperidine	100-75-4	MRL	10/05/16	0.020	0.020	0.96	0.021	103		
N-Nitrosopyrrolidine	930-55-2	MRL	10/02/16	0.020	0.019	0.93	0.020	97.9		
N-Nitrosopyrrolidine	930-55-2	MRL	10/04/16	0.020	0.018	0.98	0.018	87.5		
N-Nitrosopyrrolidine	930-55-2	MRL	10/04/16	0.020	0.021	0.82	0.026	131		
N-Nitrosopyrrolidine	930-55-2	MRL	10/05/16	0.020	0.022	0.93	0.024	119		
N-Nitrosopyrrolidine	930-55-2	MRL	10/05/16	0.020	0.021	0.94	0.022	111		

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, $r_{sd} > 90\%$ w/ 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

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 limitation 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 covered 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 ORLAP Lab Code 4061 AIHA-LAP, LLC Lab ID 178856 EPA ID WA01195 and WA DOE Lab ID C839. 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 tested or to the sample(s) as received by the laboratory. Any reproduction of this document must be in full for the report to be

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Report Template: WRPS_Nitrosamines 2.0.rpt

 Approved: 10/27/16 17:59
 Report Time Stamp: 11/18/16 15:27

W609056

Assembler		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No.	
N/A						20162738	
Collector		Contact/Requestor		Telephone No.		Page 1 of 4	
JONES		CARL HOWARD IV		373-6861			
SAF No.		Sample Origin		Purchase Order/Charge Code		MSIN 76-05 FAX 372-1878	
N/A		CARTRIDGE EVALUATION		202062/CB20			
Project Title		Logbook/ Work Package No.		Ice Chest No.		Temp 26.3	
CARTRIDGE EVALUATION		N/A		Bill of Lading/Air Bill No.			
Shipped To (Lab)		Method of Shipment		Parts and Return No.			
CARL		Data Turnaround 10 DAYS					
Protocol							
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
	S16T029531	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-BASE-EFF-A	N/A	
	S16T029532	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-BASE-IN	N/A	
	S16T029533	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-BLANK1	N/A	
	S16T029534	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-BLANK2	N/A	
	S16T029535	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-A	N/A	
	S16T029536	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-B	N/A	
	S16T029537	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-C	N/A	
	S16T029538	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-D	N/A	
	S16T029539	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-E	N/A	
	S16T029540	VA	09/10/16	Thermosorb-N	Nitrosamines 16-07837-12-EFF-F	N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
Send Results to Carl Howard IV & Greg Moore
Carl W Howard@rl.gov and Greg_S_Moore@rl.gov
see SOM for email

CONTRACT 55503
RELEASE 5

Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
Dianne Turner			9/14/16 0900	Rebecca Jones			9-14-16 0900	S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid WM = Wipe SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other DS = Drum Solids
Relinquished By			9-14-16 12:43	Relinquished By			9-14-16 1243	
Relinquished By				Relinquished By				
Relinquished By				Relinquished By				

FINAL SAMPLE DISPOSITION

Dispose Method (e.g., Return to customer, per lab procedure, used in process)

CONSUMED

Disposed By: Lee Mills

Date/Time: 10/10/16

13-30

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

W609056

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										C.O.C. No. 20162738	
										Page 2 of 4	
Assembler N/A											
Collector JONES	Contact/Requestor CARL RONALD IV		Telephone No. 373-6861		MSIN T6-05		FAX 372-1878				
SAFE No. N/A	Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 202062/CB20		Temp. 26.0						
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A		Ice Chest No.		Bill of Lading/Air Bill No.					
Shipped To (Lab) CBAL		Method of Shipment		Parts and Return No.							
Protocol N/A		Data Turnaround 10 DAYS									
Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis		Preservative			
	SI6T029541	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-EFF-G		N/A			
	SI6T029542	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-EFF-H		N/A			
	SI6T029543	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-A		N/A			
	SI6T029544	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-B		N/A			
	SI6T029545	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-C		N/A			
	SI6T029546	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-D		N/A			
	SI6T029547	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-E		N/A			
	SI6T029548	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-F		N/A			
	SI6T029549	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-G		N/A			
	SI6T029550	VA	09/10/16		Thermosorb-N	Nitrosamines 16-07837-12-IN-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</p> <p>Send Results to Carl Howard IV & Greg Moore Carl W Howard@rl.gov and Greg_S_Moore@rl.gov see SOW for email</p> <p>CONTRACT 55503 RELEASE 5</p> <p>Hold Time</p>											
Relinquished By		Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*		
Relinquished By		DIANE LUTNER		9/14/16 0900	Received By	KE ROBERTS		9-14-16 0900	S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid VM = Wipe SL = Sludge L = Liquid W = Water V = Vegetation O = Oil VA = Vapor A = Air X = Other DS = Drum Solids		
Relinquished By		KE ROBERTS		9-14-16 1243	Received By	More CPO		9-14-16 1243			
Relinquished By				Date/Time	Received By			Date/Time			
Relinquished By				Date/Time	Received By			Date/Time			
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)						Disposed By			
		CONSUMED						JW 2/16			
								Date/Time 10/10/16 13:30			

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-5603-962 (03/05)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No.		
				20162738		
				Page	3 of 4	
Assembler N/A	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861	MSIN T6-05	FAX 372-1878		
Collector JONES	Sample Origin CERTIFIED EVALUATION	Purchase Order/Charge Code 202062/330	Temp. 26.4			
SAF No.	Logbook/Work Package No.	Ice Chest No.				
Project Title CARTRIDGE EVALUATION	Method of Shipment	Bill of Lading/Air Bill No.				
Shipped To (Lab) CBAL	Data Turnaround 10 DAYS	Parts and Return No.				
Protocol N/A						
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T029551	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-BASE-EFF	N/A
	S16T029552	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-BASE-IN	N/A
	S16T029553	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-BLANK-EFF	N/A
	S16T029554	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-BLANK-IN	N/A
	S16T029555	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-A	N/A
	S16T029556	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-B	N/A
	S16T029557	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-C	N/A
	S16T029558	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-D	N/A
	S16T029559	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-E	N/A
	S16T029560	VA	09/10/16	Thermosorb-N	Nitrosamines 16-08068-12-EFF-F	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 Howard IV & Greg Moore Carl N Howard@rl.gov and Greg_S_Moore@rl.gov see SOW for email</p> <p>CONTRACT 55503 RELEASE 5</p> <p>Hold Time</p>						
Relinquished By Diane Turner Print Sign Date/Time 9/14/16 0900	Received By Rekees Print Sign Date/Time 9-14-16 0900					
Relinquished By Rekees Print Sign Date/Time 9-14-16 1243	Received By Lopez Print Sign Date/Time 9-14-16 1243					
Relinquished By	Date/Time	Received By	Date/Time			
Relinquished By	Date/Time	Received By	Date/Time			
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By the rules			
	CONSUMED		Date/Time 10/6/16 13:30			

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

A-6003-962 (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 (TIC)”.
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 correction¹⁹ as shown in the following equation:

$$C = 24.45 \frac{r}{M V}$$

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 mg/sample , the value of C needs to be multiplied by 1000; if the analytical result unit is in ng/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 g/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_{standard}) and 760 Torr (P_{standard}), respectively. For temperatures, the reported upstream temperatures for each time period were used (T_{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_{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 $(P_{\text{upstream}} - P_{\text{tube}}) \div P_{\text{standard}}$.

¹⁹ Based on the standard temperature and pressure condition of $P = 101325 \text{ Pa}$, $R = 8.314 \text{ J}/(\text{mol}\cdot\text{K})$, and $T = 298.15 \text{ K}$.

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 _{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_{upstream}) was 734 Torr and the corresponding temperature (T_{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 (DL)—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 DL as the percentage of the OEL for each COPC. Because flow rates vary, the calculated concentrations were different for each point, even though some of the results are less than the DL in the original reading. The last column in the tables below indicate if the original readings were less than the DL or not.
 1. For ammonia and mercury, only the results obtained from using method of total vapor of ammonia and mercury were used.
 2. For furan, results from the Furan tube instead of Carbotrap 300 TDU were used. For acetonitrile, results from the Carbotrap 300 TDU tube were used. For butanal, the results from the Carbotrap 300 TDU tube instead of the aldehydes tube were used. For pyridine and 2,4-dimethylpyridine, the results from the Carbotrap 300 TDU tube were used.
 3. For N-Nitrosodimethylamine (NDMA) 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.

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.

The position numbers that start with 7837 are for the SCOTT 7422-SD1 model of cartridge, and the position numbers that start with 8068 are for the SCOTT 7422-SC1 model of cartridge.

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
1	Ammonia	2	7837-A1	175.6	25	702%		2.6%
1	Ammonia	4	7837-B1	196.4	25	786%		2.6%
1	Ammonia	6	7837-C1	200.2	25	801%		2.6%
1	Ammonia	8	7837-D1	182.6	25	730%		2.6%
1	Ammonia	10	7837-E1	186.6	25	746%		2.6%
1	Ammonia	12	7837-F1	186.8	25	747%		2.6%
1	Ammonia	14	7837-G1	184.5	25	738%		2.6%
1	Ammonia	16	7837-H1	150.6	25	602%		2.6%
1	Ammonia	2	7837-A2	0.61	25	2.4%	YES	2.6%
1	Ammonia	4	7837-B2	42.1	25	168%		2.6%
1	Ammonia	6	7837-C2	132.0	25	528%		2.6%
1	Ammonia	8	7837-D2	85.1	25	340%		2.6%
1	Ammonia	10	7837-E2	159.6	25	639%		2.6%
1	Ammonia	12	7837-F2	142.4	25	570%		2.6%
1	Ammonia	14	7837-G2	155.2	25	621%		2.6%
1	Ammonia	16	7837-H2	146.7	25	587%		2.6%
1	Ammonia	2	8068-A1	170.4	25	681%		2.6%
1	Ammonia	4	8068-B1	163.7	25	655%		2.6%
1	Ammonia	6	8068-C1	182.7	25	731%		2.6%
1	Ammonia	8	8068-D1	185.2	25	741%		2.6%
1	Ammonia	10	8068-E1	181.8	25	727%		2.6%
1	Ammonia	12	8068-F1	173.5	25	694%		2.6%
1	Ammonia	14	8068-G1	175.2	25	701%		2.6%
1	Ammonia	16	8068-H1	156.8	25	627%		2.6%
1	Ammonia	2	8068-A2	1.2	25	4.9%		2.6%
1	Ammonia	4	8068-B2	38.1	25	152%		2.6%
1	Ammonia	6	8068-C2	126.3	25	505%		2.6%
1	Ammonia	8	8068-D2	49.7	25	199%		2.6%
1	Ammonia	10	8068-E2	0.64	25	2.6%	YES	2.6%
1	Ammonia	12	8068-F2	134.1	25	536%		2.6%
1	Ammonia	14	8068-G2	158.5	25	634%		2.6%
1	Ammonia	16	8068-H2	191.7	25	767%		2.6%
3	Mercury	2	7837-A1	0.00065	0.003	21.2%		7.3%
3	Mercury	4	7837-B1	0.00074	0.003	24.3%		7.3%
3	Mercury	6	7837-C1	0.00064	0.003	20.9%		7.3%
3	Mercury	8	7837-D1	0.00058	0.003	19.2%		7.3%
3	Mercury	10	7837-E1	0.00058	0.003	19.1%		7.3%
3	Mercury	12	7837-F1	0.00064	0.003	20.9%		7.3%
3	Mercury	14	7837-G1	0.00047	0.003	15.5%		7.3%
3	Mercury	16	7837-H1	0.00042	0.003	13.9%		7.3%
3	Mercury	2	7837-A2	0.00021	0.003	7.0%	YES	7.3%
3	Mercury	4	7837-B2	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	6	7837-C2	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	8	7837-D2	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	10	7837-E2	0.00021	0.003	7.0%	YES	7.3%
3	Mercury	12	7837-F2	0.00021	0.003	6.8%	YES	7.3%
3	Mercury	14	7837-G2	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	16	7837-H2	0.00021	0.003	6.8%	YES	7.3%
3	Mercury	2	8068-A1	0.00064	0.003	21.0%		7.3%
3	Mercury	4	8068-B1	0.00051	0.003	16.8%		7.3%
3	Mercury	6	8068-C1	0.00062	0.003	20.4%		7.3%
3	Mercury	8	8068-D1	0.00069	0.003	22.7%		7.3%
3	Mercury	10	8068-E1	0.00063	0.003	20.8%		7.3%
3	Mercury	12	8068-F1	0.00061	0.003	20.1%		7.3%
3	Mercury	14	8068-G1	0.00047	0.003	15.4%		7.3%
3	Mercury	16	8068-H1	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	2	8068-A2	0.00021	0.003	7.0%	YES	7.3%
3	Mercury	4	8068-B2	0.00022	0.003	7.2%	YES	7.3%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
3	Mercury	6	8068-C2	0.00022	0.003	7.3%	YES	7.3%
3	Mercury	8	8068-D2	0.00022	0.003	7.3%	YES	7.3%
3	Mercury	10	8068-E2	0.00022	0.003	7.2%	YES	7.3%
3	Mercury	12	8068-F2	0.00022	0.003	7.1%	YES	7.3%
3	Mercury	14	8068-G2	0.00021	0.003	6.9%	YES	7.3%
3	Mercury	16	8068-H2	0.00050	0.003	16.3%		7.3%
4	1,3-Butadiene	2	7837-A1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	4	7837-B1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	6	7837-C1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	8	7837-D1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	10	7837-E1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	12	7837-F1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	14	7837-G1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	16	7837-H1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	2	7837-A2	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	4	7837-B2	0.021	1.0	2.1%	YES	2.1%
4	1,3-Butadiene	6	7837-C2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	8	7837-D2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	10	7837-E2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	12	7837-F2	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	14	7837-G2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	16	7837-H2	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	2	8068-A1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	4	8068-B1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	6	8068-C1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	8	8068-D1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	10	8068-E1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	12	8068-F1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	14	8068-G1	0.019	1.0	1.9%	YES	2.1%
4	1,3-Butadiene	16	8068-H1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	2	8068-A2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	4	8068-B2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	6	8068-C2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	8	8068-D2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	10	8068-E2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	12	8068-F2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	14	8068-G2	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene	16	8068-H2	0.020	1.0	2.0%	YES	2.1%
5	Benzene	2	7837-A1	0.00089	0.5	0.178%		0.021%
5	Benzene	4	7837-B1	0.00094	0.5	0.188%		0.021%
5	Benzene	6	7837-C1	0.00090	0.5	0.179%		0.021%
5	Benzene	8	7837-D1	0.00085	0.5	0.170%		0.021%
5	Benzene	10	7837-E1	0.00087	0.5	0.175%		0.021%
5	Benzene	12	7837-F1	0.00073	0.5	0.146%		0.021%
5	Benzene	14	7837-G1	0.00078	0.5	0.156%		0.021%
5	Benzene	16	7837-H1	0.00072	0.5	0.145%		0.021%
5	Benzene	2	7837-A2	0.00018	0.5	0.036%		0.021%
5	Benzene	4	7837-B2	0.00017	0.5	0.035%		0.021%
5	Benzene	6	7837-C2	0.00016	0.5	0.031%		0.021%
5	Benzene	8	7837-D2	0.00011	0.5	0.022%		0.021%
5	Benzene	10	7837-E2	0.00010	0.5	0.020%	YES	0.021%
5	Benzene	12	7837-F2	0.00010	0.5	0.020%	YES	0.021%
5	Benzene	14	7837-G2	0.00012	0.5	0.024%		0.021%
5	Benzene	16	7837-H2	0.00010	0.5	0.019%	YES	0.021%
5	Benzene	2	8068-A1	0.00075	0.5	0.150%		0.021%
5	Benzene	4	8068-B1	0.00082	0.5	0.165%		0.021%
5	Benzene	6	8068-C1	0.00081	0.5	0.162%		0.021%
5	Benzene	8	8068-D1	0.00079	0.5	0.159%		0.021%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
5	Benzene	10	8068-E1	0.00079	0.5	0.157%		0.021%
5	Benzene	12	8068-F1	0.00058	0.5	0.117%		0.021%
5	Benzene	14	8068-G1	0.00057	0.5	0.114%		0.021%
5	Benzene	16	8068-H1	0.00012	0.5	0.024%		0.021%
5	Benzene	2	8068-A2	0.00014	0.5	0.029%		0.021%
5	Benzene	4	8068-B2	0.00021	0.5	0.041%		0.021%
5	Benzene	6	8068-C2	0.00017	0.5	0.034%		0.021%
5	Benzene	8	8068-D2	0.00013	0.5	0.027%		0.021%
5	Benzene	10	8068-E2	0.00011	0.5	0.021%	YES	0.021%
5	Benzene	12	8068-F2	0.00010	0.5	0.019%	YES	0.021%
5	Benzene	14	8068-G2	0.00010	0.5	0.020%	YES	0.021%
5	Benzene	16	8068-H2	0.00045	0.5	0.090%		0.021%
6	Biphenyl	2	7837-A1	0.00017	0.2	0.083%	YES	0.096%
6	Biphenyl	4	7837-B1	0.00017	0.2	0.084%	YES	0.096%
6	Biphenyl	6	7837-C1	0.00017	0.2	0.084%	YES	0.096%
6	Biphenyl	8	7837-D1	0.00017	0.2	0.087%	YES	0.096%
6	Biphenyl	10	7837-E1	0.00017	0.2	0.085%	YES	0.096%
6	Biphenyl	12	7837-F1	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	14	7837-G1	0.00016	0.2	0.081%	YES	0.096%
6	Biphenyl	16	7837-H1	0.00015	0.2	0.077%	YES	0.096%
6	Biphenyl	2	7837-A2	0.00017	0.2	0.083%	YES	0.096%
6	Biphenyl	4	7837-B2	0.00017	0.2	0.084%	YES	0.096%
6	Biphenyl	6	7837-C2	0.00017	0.2	0.084%	YES	0.096%
6	Biphenyl	8	7837-D2	0.00017	0.2	0.085%	YES	0.096%
6	Biphenyl	10	7837-E2	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	12	7837-F2	0.00016	0.2	0.082%	YES	0.096%
6	Biphenyl	14	7837-G2	0.00016	0.2	0.082%	YES	0.096%
6	Biphenyl	16	7837-H2	0.00016	0.2	0.081%	YES	0.096%
6	Biphenyl	2						0.096%
6	Biphenyl	4	8068-B1	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	6	8068-C1	0.00018	0.2	0.090%	YES	0.096%
6	Biphenyl	8	8068-D1	0.00019	0.2	0.096%	YES	0.096%
6	Biphenyl	10	8068-E1	0.00018	0.2	0.089%	YES	0.096%
6	Biphenyl	12						0.096%
6	Biphenyl	14						0.096%
6	Biphenyl	16	8068-H1	0.00017	0.2	0.085%	YES	0.096%
6	Biphenyl	2	8068-A2	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	4	8068-B2	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	6	8068-C2	0.00018	0.2	0.089%	YES	0.096%
6	Biphenyl	8	8068-D2	0.00018	0.2	0.088%	YES	0.096%
6	Biphenyl	10	8068-E2	0.00017	0.2	0.087%	YES	0.096%
6	Biphenyl	12	8068-F2	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	14	8068-G2	0.00017	0.2	0.086%	YES	0.096%
6	Biphenyl	16	8068-H2	0.00017	0.2	0.086%	YES	0.096%
7	1-Butanol	2	7837-A1	0.05198	20	0.260%		0.004%
7	1-Butanol	4	7837-B1	0.06107	20	0.305%		0.004%
7	1-Butanol	6	7837-C1	0.05951	20	0.298%		0.004%
7	1-Butanol	8	7837-D1	0.03410	20	0.171%		0.004%
7	1-Butanol	10	7837-E1	0.02763	20	0.138%		0.004%
7	1-Butanol	12	7837-F1	0.03181	20	0.159%		0.004%
7	1-Butanol	14	7837-G1	0.02876	20	0.144%		0.004%
7	1-Butanol	16	7837-H1	0.03441	20	0.172%		0.004%
7	1-Butanol	2	7837-A2	0.00081	20	0.004%	YES	0.004%
7	1-Butanol	4	7837-B2	0.00526	20	0.026%		0.004%
7	1-Butanol	6	7837-C2	0.00081	20	0.004%	YES	0.004%
7	1-Butanol	8	7837-D2	0.00080	20	0.004%	YES	0.004%
7	1-Butanol	10	7837-E2	0.00079	20	0.004%	YES	0.004%
7	1-Butanol	12	7837-F2	0.00079	20	0.004%	YES	0.004%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
7	1-Butanol	14	7837-G2	0.00076	20	0.004%	YES	0.004%
7	1-Butanol	16	7837-H2	0.00075	20	0.004%	YES	0.004%
7	1-Butanol	2	8068-A1	0.04797	20	0.240%		0.004%
7	1-Butanol	4	8068-B1	0.05552	20	0.278%		0.004%
7	1-Butanol	6	8068-C1	0.06328	20	0.316%		0.004%
7	1-Butanol	8	8068-D1	0.05063	20	0.253%		0.004%
7	1-Butanol	10	8068-E1	0.05280	20	0.264%		0.004%
7	1-Butanol	12	8068-F1	0.04044	20	0.202%		0.004%
7	1-Butanol	14	8068-G1	0.04142	20	0.207%		0.004%
7	1-Butanol	16	8068-H1	0.00763	20	0.038%		0.004%
7	1-Butanol	2	8068-A2	0.00455	20	0.023%		0.004%
7	1-Butanol	4	8068-B2	0.00712	20	0.036%		0.004%
7	1-Butanol	6	8068-C2	0.00417	20	0.021%		0.004%
7	1-Butanol	8	8068-D2	0.00760	20	0.038%		0.004%
7	1-Butanol	10	8068-E2	0.00362	20	0.018%		0.004%
7	1-Butanol	12	8068-F2	0.00470	20	0.024%		0.004%
7	1-Butanol	14	8068-G2	0.00689	20	0.034%		0.004%
7	1-Butanol	16	8068-H2	0.02925	20	0.146%		0.004%
9	2-Hexanone	2	7837-A1	0.00189	5.0	0.038%		0.002%
9	2-Hexanone	4	7837-B1	0.00238	5.0	0.048%		0.002%
9	2-Hexanone	6	7837-C1	0.00252	5.0	0.050%		0.002%
9	2-Hexanone	8	7837-D1	0.00219	5.0	0.044%		0.002%
9	2-Hexanone	10	7837-E1	0.00223	5.0	0.045%		0.002%
9	2-Hexanone	12	7837-F1	0.00204	5.0	0.041%		0.002%
9	2-Hexanone	14	7837-G1	0.00195	5.0	0.039%		0.002%
9	2-Hexanone	16	7837-H1	0.00217	5.0	0.043%		0.002%
9	2-Hexanone	2	7837-A2	0.00009	5.0	0.002%		0.002%
9	2-Hexanone	4	7837-B2	0.00010	5.0	0.002%		0.002%
9	2-Hexanone	6	7837-C2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	8	7837-D2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	10	7837-E2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	12	7837-F2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	14	7837-G2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	16	7837-H2	0.00007	5.0	0.001%	YES	0.002%
9	2-Hexanone	2	8068-A1	0.00158	5.0	0.032%		0.002%
9	2-Hexanone	4	8068-B1	0.00308	5.0	0.062%		0.002%
9	2-Hexanone	6	8068-C1	0.00196	5.0	0.039%		0.002%
9	2-Hexanone	8	8068-D1	0.00286	5.0	0.057%		0.002%
9	2-Hexanone	10	8068-E1	0.00209	5.0	0.042%		0.002%
9	2-Hexanone	12	8068-F1	0.00169	5.0	0.034%		0.002%
9	2-Hexanone	14	8068-G1	0.00196	5.0	0.039%		0.002%
9	2-Hexanone	16	8068-H1	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	2	8068-A2	0.00009	5.0	0.002%		0.002%
9	2-Hexanone	4	8068-B2	0.00013	5.0	0.003%		0.002%
9	2-Hexanone	6	8068-C2	0.00013	5.0	0.003%		0.002%
9	2-Hexanone	8	8068-D2	0.00009	5.0	0.002%	YES	0.002%
9	2-Hexanone	10	8068-E2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	12	8068-F2	0.00007	5.0	0.001%	YES	0.002%
9	2-Hexanone	14	8068-G2	0.00008	5.0	0.002%	YES	0.002%
9	2-Hexanone	16	8068-H2	0.00139	5.0	0.028%		0.002%
11	4-Methyl-2-hexanone	2	7837-A1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	4	7837-B1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	6	7837-C1	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	8	7837-D1	0.00008	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	10	7837-E1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	12	7837-F1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	14	7837-G1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	16	7837-H1	0.00007	0.5	0.014%	YES	0.017%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
11	4-Methyl-2-hexanone	2	7837-A2	0.00008	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	4	7837-B2	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	6	7837-C2	0.00008	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	8	7837-D2	0.00008	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	10	7837-E2	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	12	7837-F2	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	14	7837-G2	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	16	7837-H2	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	2	8068-A1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	4	8068-B1	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	6	8068-C1	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	8	8068-D1	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	10	8068-E1	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	12	8068-F1	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	14	8068-G1	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	16	8068-H1	0.00010	0.5	0.021%		0.017%
11	4-Methyl-2-hexanone	2	8068-A2	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	4	8068-B2	0.00008	0.5	0.017%	YES	0.017%
11	4-Methyl-2-hexanone	6	8068-C2	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	8	8068-D2	0.00008	0.5	0.017%	YES	0.017%
11	4-Methyl-2-hexanone	10	8068-E2	0.00008	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	12	8068-F2	0.00007	0.5	0.014%	YES	0.017%
11	4-Methyl-2-hexanone	14	8068-G2	0.00007	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	16	8068-H2	0.00006	0.5	0.012%	YES	0.017%
13	3-Buten-2-one	2	7837-A1	0.00261	0.2	1.31%		0.08%
13	3-Buten-2-one	4	7837-B1	0.00253	0.2	1.27%		0.08%
13	3-Buten-2-one	6	7837-C1	0.00210	0.2	1.05%		0.08%
13	3-Buten-2-one	8	7837-D1	0.00190	0.2	0.95%		0.08%
13	3-Buten-2-one	10	7837-E1	0.00159	0.2	0.80%		0.08%
13	3-Buten-2-one	12	7837-F1	0.00142	0.2	0.71%		0.08%
13	3-Buten-2-one	14	7837-G1	0.00113	0.2	0.56%		0.08%
13	3-Buten-2-one	16	7837-H1	0.00160	0.2	0.80%		0.08%
13	3-Buten-2-one	2	7837-A2	0.00034	0.2	0.17%		0.08%
13	3-Buten-2-one	4	7837-B2	0.00038	0.2	0.19%		0.08%
13	3-Buten-2-one	6	7837-C2	0.00029	0.2	0.14%		0.08%
13	3-Buten-2-one	8	7837-D2	0.00016	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	10	7837-E2	0.00016	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	12	7837-F2	0.00016	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	14	7837-G2	0.00015	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	16	7837-H2	0.00019	0.2	0.09%		0.08%
13	3-Buten-2-one	2	8068-A1	0.00145	0.2	0.72%		0.08%
13	3-Buten-2-one	4	8068-B1	0.00339	0.2	1.70%		0.08%
13	3-Buten-2-one	6	8068-C1	0.00317	0.2	1.58%		0.08%
13	3-Buten-2-one	8	8068-D1	0.00292	0.2	1.46%		0.08%
13	3-Buten-2-one	10	8068-E1	0.00160	0.2	0.80%		0.08%
13	3-Buten-2-one	12	8068-F1	0.00112	0.2	0.56%		0.08%
13	3-Buten-2-one	14	8068-G1	0.00205	0.2	1.03%		0.08%
13	3-Buten-2-one	16	8068-H1	0.00142	0.2	0.71%		0.08%
13	3-Buten-2-one	2	8068-A2	0.00036	0.2	0.18%		0.08%
13	3-Buten-2-one	4	8068-B2	0.00044	0.2	0.22%		0.08%
13	3-Buten-2-one	6	8068-C2	0.00040	0.2	0.20%		0.08%
13	3-Buten-2-one	8	8068-D2	0.00021	0.2	0.11%		0.08%
13	3-Buten-2-one	10	8068-E2	0.00017	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	12	8068-F2	0.00015	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	14	8068-G2	0.00015	0.2	0.08%	YES	0.08%
13	3-Buten-2-one	16	8068-H2	0.00096	0.2	0.48%		0.08%
14	Formaldehyde	2	7837-A1	0.0312	0.3	10.4%		0.63%
14	Formaldehyde	4	7837-B1	0.0017	0.3	0.58%	YES	0.63%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
14	Formaldehyde	6	7837-C1	0.0018	0.3	0.59%	YES	0.63%
14	Formaldehyde	8	7837-D1	0.0248	0.3	8.3%		0.63%
14	Formaldehyde	10	7837-E1	0.0242	0.3	8.1%		0.63%
14	Formaldehyde	12	7837-F1	0.0018	0.3	0.58%	YES	0.63%
14	Formaldehyde	14	7837-G1	0.0017	0.3	0.58%	YES	0.63%
14	Formaldehyde	16	7837-H1	0.0017	0.3	0.58%	YES	0.63%
14	Formaldehyde	2	7837-A2	0.0018	0.3	0.58%	YES	0.63%
14	Formaldehyde	4	7837-B2	0.0020	0.3	0.67%		0.63%
14	Formaldehyde	6	7837-C2	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	8	7837-D2	0.0018	0.3	0.61%	YES	0.63%
14	Formaldehyde	10	7837-E2	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	12	7837-F2	0.0018	0.3	0.59%	YES	0.63%
14	Formaldehyde	14	7837-G2	0.0018	0.3	0.59%	YES	0.63%
14	Formaldehyde	16	7837-H2	0.0017	0.3	0.58%	YES	0.63%
14	Formaldehyde	2	8068-A1	0.0352	0.3	11.7%		0.63%
14	Formaldehyde	4	8068-B1	0.0428	0.3	14.3%		0.63%
14	Formaldehyde	6	8068-C1	0.0431	0.3	14.4%		0.63%
14	Formaldehyde	8	8068-D1	0.0018	0.3	0.61%	YES	0.63%
14	Formaldehyde	10	8068-E1	0.0188	0.3	6.3%		0.63%
14	Formaldehyde	12	8068-F1	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	14	8068-G1	0.0018	0.3	0.59%	YES	0.63%
14	Formaldehyde	16	8068-H1	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	2	8068-A2	0.0018	0.3	0.59%	YES	0.63%
14	Formaldehyde	4	8068-B2	0.0018	0.3	0.58%	YES	0.63%
14	Formaldehyde	6	8068-C2	0.0019	0.3	0.62%	YES	0.63%
14	Formaldehyde	8	8068-D2	0.0019	0.3	0.63%	YES	0.63%
14	Formaldehyde	10	8068-E2	0.0019	0.3	0.62%	YES	0.63%
14	Formaldehyde	12	8068-F2	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	14	8068-G2	0.0018	0.3	0.60%	YES	0.63%
14	Formaldehyde	16	8068-H2	0.0018	0.3	0.59%	YES	0.63%
15	Acetaldehyde	2	7837-A1	0.0981	25	0.392%		0.005%
15	Acetaldehyde	4	7837-B1	0.0988	25	0.395%		0.005%
15	Acetaldehyde	6	7837-C1	0.1007	25	0.403%		0.005%
15	Acetaldehyde	8	7837-D1	0.0796	25	0.318%		0.005%
15	Acetaldehyde	10	7837-E1	0.0836	25	0.335%		0.005%
15	Acetaldehyde	12	7837-F1	0.0861	25	0.344%		0.005%
15	Acetaldehyde	14	7837-G1	0.0754	25	0.301%		0.005%
15	Acetaldehyde	16	7837-H1	0.0824	25	0.330%		0.005%
15	Acetaldehyde	2	7837-A2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	4	7837-B2	0.0384	25	0.154%		0.005%
15	Acetaldehyde	6	7837-C2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	8	7837-D2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	10	7837-E2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	12	7837-F2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	14	7837-G2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	16	7837-H2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	2	8068-A1	0.0935	25	0.374%		0.005%
15	Acetaldehyde	4	8068-B1	0.0948	25	0.379%		0.005%
15	Acetaldehyde	6	8068-C1	0.1054	25	0.422%		0.005%
15	Acetaldehyde	8	8068-D1	0.0977	25	0.391%		0.005%
15	Acetaldehyde	10	8068-E1	0.0905	25	0.362%		0.005%
15	Acetaldehyde	12	8068-F1	0.0853	25	0.341%		0.005%
15	Acetaldehyde	14	8068-G1	0.0701	25	0.280%		0.005%
15	Acetaldehyde	16	8068-H1	0.0537	25	0.215%		0.005%
15	Acetaldehyde	2	8068-A2	0.0481	25	0.192%		0.005%
15	Acetaldehyde	4	8068-B2	0.0012	25	0.005%	YES	0.005%
15	Acetaldehyde	6	8068-C2	0.0013	25	0.005%	YES	0.005%
15	Acetaldehyde	8	8068-D2	0.0013	25	0.005%	YES	0.005%
15	Acetaldehyde	10	8068-E2	0.0532	25	0.213%		0.005%
15	Acetaldehyde	12	8068-F2	0.0519	25	0.208%		0.005%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
15	Acetaldehyde	14	8068-G2	0.0491	25	0.196%		0.005%
15	Acetaldehyde	16	8068-H2	0.0802	25	0.321%		0.005%
16	Butanal	2	7837-A1	0.0020	25	0.008%		0.001%
16	Butanal	4	7837-B1	0.0020	25	0.008%		0.001%
16	Butanal	6	7837-C1	0.0019	25	0.008%		0.001%
16	Butanal	8	7837-D1	0.0036	25	0.014%		0.001%
16	Butanal	10	7837-E1	0.0028	25	0.011%		0.001%
16	Butanal	12	7837-F1	0.0027	25	0.011%		0.001%
16	Butanal	14	7837-G1	0.0029	25	0.011%		0.001%
16	Butanal	16	7837-H1	0.0041	25	0.017%		0.001%
16	Butanal	2	7837-A2	0.0003	25	0.001%		0.001%
16	Butanal	4	7837-B2	0.0003	25	0.001%		0.001%
16	Butanal	6	7837-C2	0.0003	25	0.001%		0.001%
16	Butanal	8	7837-D2	0.0002	25	0.001%	YES	0.001%
16	Butanal	10	7837-E2	0.0002	25	0.001%	YES	0.001%
16	Butanal	12	7837-F2	0.0002	25	0.001%	YES	0.001%
16	Butanal	14	7837-G2	0.0002	25	0.001%	YES	0.001%
16	Butanal	16	7837-H2	0.0002	25	0.001%	YES	0.001%
16	Butanal	2	8068-A1	0.0014	25	0.006%		0.001%
16	Butanal	4	8068-B1	0.0042	25	0.017%		0.001%
16	Butanal	6	8068-C1	0.0034	25	0.014%		0.001%
16	Butanal	8	8068-D1	0.0028	25	0.011%		0.001%
16	Butanal	10	8068-E1	0.0016	25	0.007%		0.001%
16	Butanal	12	8068-F1	0.0014	25	0.005%		0.001%
16	Butanal	14	8068-G1	0.0025	25	0.010%		0.001%
16	Butanal	16	8068-H1	0.0002	25	0.001%	YES	0.001%
16	Butanal	2	8068-A2	0.0003	25	0.001%		0.001%
16	Butanal	4	8068-B2	0.0002	25	0.001%	YES	0.001%
16	Butanal	6	8068-C2	0.0002	25	0.001%	YES	0.001%
16	Butanal	8	8068-D2	0.0002	25	0.001%	YES	0.001%
16	Butanal	10	8068-E2	0.0002	25	0.001%	YES	0.001%
16	Butanal	12	8068-F2	0.0002	25	0.001%	YES	0.001%
16	Butanal	14	8068-G2	0.0002	25	0.001%	YES	0.001%
16	Butanal	16	8068-H2	0.0014	25	0.005%		0.001%
19	Furan	2	7837-A1	0.00004	0.001	3.5%	YES	3.6%
19	Furan	4	7837-B1	0.00004	0.001	3.6%	YES	3.6%
19	Furan	6	7837-C1	0.00004	0.001	3.6%	YES	3.6%
19	Furan	8	7837-D1	0.00004	0.001	3.6%	YES	3.6%
19	Furan	10	7837-E1	0.00004	0.001	3.6%	YES	3.6%
19	Furan	12	7837-F1	0.00003	0.001	3.4%	YES	3.6%
19	Furan	14	7837-G1	0.00003	0.001	3.5%	YES	3.6%
19	Furan	16	7837-H1	0.00003	0.001	3.4%	YES	3.6%
19	Furan	2	7837-A2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	4	7837-B2	0.00002	0.001	2.4%	YES	3.6%
19	Furan	6	7837-C2	0.00002	0.001	2.5%	YES	3.6%
19	Furan	8	7837-D2	0.00002	0.001	2.4%	YES	3.6%
19	Furan	10	7837-E2	0.00002	0.001	2.2%	YES	3.6%
19	Furan	12	7837-F2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	14						3.6%
19	Furan	16	7837-H2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	2	8068-A1	0.00014	0.001	14.0%		3.6%
19	Furan	4	8068-B1	0.00015	0.001	14.7%		3.6%
19	Furan	6						3.6%
19	Furan	8	8068-D1	0.00003	0.001	3.4%	YES	3.6%
19	Furan	10	8068-E1	0.00004	0.001	3.6%	YES	3.6%
19	Furan	12	8068-F1	0.00004	0.001	3.5%	YES	3.6%
19	Furan	14	8068-G1	0.00004	0.001	3.5%	YES	3.6%
19	Furan	16	8068-H1	0.00004	0.001	3.5%	YES	3.6%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
19	Furan	2	8068-A2	0.00002	0.001	2.2%	YES	3.6%
19	Furan	4	8068-B2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	6	8068-C2	0.00002	0.001	2.2%	YES	3.6%
19	Furan	8	8068-D2	0.00002	0.001	2.2%	YES	3.6%
19	Furan	10	8068-E2	0.00002	0.001	2.4%	YES	3.6%
19	Furan	12	8068-F2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	14	8068-G2	0.00002	0.001	2.3%	YES	3.6%
19	Furan	16	8068-H2	0.00006	0.001	6.2%		3.6%
20	2,3-Dihydrofuran	2	7837-A1	0.00019	0.001	19.4%		2.1%
20	2,3-Dihydrofuran	4	7837-B1	0.00022	0.001	21.5%		2.1%
20	2,3-Dihydrofuran	6	7837-C1	0.00020	0.001	19.9%		2.1%
20	2,3-Dihydrofuran	8	7837-D1	0.00015	0.001	15.1%		2.1%
20	2,3-Dihydrofuran	10	7837-E1	0.00016	0.001	16.0%		2.1%
20	2,3-Dihydrofuran	12	7837-F1	0.00008	0.001	8.5%		2.1%
20	2,3-Dihydrofuran	14	7837-G1	0.00005	0.001	5.5%		2.1%
20	2,3-Dihydrofuran	16	7837-H1	0.00004	0.001	3.7%		2.1%
20	2,3-Dihydrofuran	2	7837-A2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	4	7837-B2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	6	7837-C2	0.00001	0.001	1.5%	YES	2.1%
20	2,3-Dihydrofuran	8	7837-D2	0.00001	0.001	1.5%	YES	2.1%
20	2,3-Dihydrofuran	10	7837-E2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	12	7837-F2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	14						2.1%
20	2,3-Dihydrofuran	16	7837-H2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	2	8068-A1	0.00029	0.001	29.1%		2.1%
20	2,3-Dihydrofuran	4	8068-B1	0.00044	0.001	43.6%		2.1%
20	2,3-Dihydrofuran	6						2.1%
20	2,3-Dihydrofuran	8	8068-D1	0.00011	0.001	10.6%		2.1%
20	2,3-Dihydrofuran	10	8068-E1	0.00018	0.001	17.9%		2.1%
20	2,3-Dihydrofuran	12	8068-F1	0.00017	0.001	16.6%		2.1%
20	2,3-Dihydrofuran	14	8068-G1	0.00017	0.001	16.6%		2.1%
20	2,3-Dihydrofuran	16	8068-H1	0.00002	0.001	2.1%	YES	2.1%
20	2,3-Dihydrofuran	2	8068-A2	0.00001	0.001	1.3%	YES	2.1%
20	2,3-Dihydrofuran	4	8068-B2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	6	8068-C2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	8	8068-D2	0.00003	0.001	3.2%		2.1%
20	2,3-Dihydrofuran	10	8068-E2	0.00001	0.001	1.5%	YES	2.1%
20	2,3-Dihydrofuran	12	8068-F2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	14	8068-G2	0.00001	0.001	1.4%	YES	2.1%
20	2,3-Dihydrofuran	16	8068-H2	0.00010	0.001	10.4%		2.1%
21	2,5-Dihydrofuran	2	7837-A1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	4	7837-B1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	6	7837-C1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	8	7837-D1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	10	7837-E1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	12	7837-F1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	14	7837-G1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	16	7837-H1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	2	7837-A2	0.00002	0.001	2.0%	YES	3.1%
21	2,5-Dihydrofuran	4	7837-B2	0.00003	0.001	2.6%		3.1%
21	2,5-Dihydrofuran	6	7837-C2	0.00003	0.001	2.8%		3.1%
21	2,5-Dihydrofuran	8	7837-D2	0.00002	0.001	2.4%		3.1%
21	2,5-Dihydrofuran	10	7837-E2	0.00002	0.001	1.9%	YES	3.1%
21	2,5-Dihydrofuran	12	7837-F2	0.00002	0.001	2.0%	YES	3.1%
21	2,5-Dihydrofuran	14						3.1%
21	2,5-Dihydrofuran	16	7837-H2	0.00002	0.001	1.9%	YES	3.1%
21	2,5-Dihydrofuran	2	8068-A1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	4	8068-B1	0.00003	0.001	2.9%	YES	3.1%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
21	2,5-Dihydrofuran	6						3.1%
21	2,5-Dihydrofuran	8	8068-D1	0.00003	0.001	2.9%	YES	3.1%
21	2,5-Dihydrofuran	10	8068-E1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	12	8068-F1	0.00003	0.001	3.0%	YES	3.1%
21	2,5-Dihydrofuran	14	8068-G1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	16	8068-H1	0.00003	0.001	3.1%	YES	3.1%
21	2,5-Dihydrofuran	2	8068-A2	0.00002	0.001	1.9%	YES	3.1%
21	2,5-Dihydrofuran	4	8068-B2	0.00002	0.001	2.0%	YES	3.1%
21	2,5-Dihydrofuran	6	8068-C2	0.00004	0.001	3.9%		3.1%
21	2,5-Dihydrofuran	8	8068-D2	0.00004	0.001	4.0%		3.1%
21	2,5-Dihydrofuran	10	8068-E2	0.00002	0.001	2.1%	YES	3.1%
21	2,5-Dihydrofuran	12	8068-F2	0.00002	0.001	2.0%	YES	3.1%
21	2,5-Dihydrofuran	14	8068-G2	0.00002	0.001	2.0%	YES	3.1%
21	2,5-Dihydrofuran	16	8068-H2	0.00002	0.001	1.8%	YES	3.1%
22	2-Methylfuran	2	7837-A1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	4	7837-B1	0.00004	0.001	3.7%	YES	3.7%
22	2-Methylfuran	6	7837-C1	0.00004	0.001	3.7%	YES	3.7%
22	2-Methylfuran	8	7837-D1	0.00004	0.001	3.7%	YES	3.7%
22	2-Methylfuran	10	7837-E1	0.00004	0.001	3.7%	YES	3.7%
22	2-Methylfuran	12	7837-F1	0.00004	0.001	3.5%	YES	3.7%
22	2-Methylfuran	14	7837-G1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	16	7837-H1	0.00004	0.001	3.5%	YES	3.7%
22	2-Methylfuran	2	7837-A2	0.00002	0.001	2.4%	YES	3.7%
22	2-Methylfuran	4	7837-B2	0.00002	0.001	2.5%	YES	3.7%
22	2-Methylfuran	6	7837-C2	0.00003	0.001	2.5%	YES	3.7%
22	2-Methylfuran	8	7837-D2	0.00003	0.001	2.5%	YES	3.7%
22	2-Methylfuran	10	7837-E2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	12	7837-F2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	14						3.7%
22	2-Methylfuran	16	7837-H2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	2	8068-A1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	4	8068-B1	0.00003	0.001	3.5%	YES	3.7%
22	2-Methylfuran	6						3.7%
22	2-Methylfuran	8	8068-D1	0.00003	0.001	3.5%	YES	3.7%
22	2-Methylfuran	10	8068-E1	0.00004	0.001	3.7%	YES	3.7%
22	2-Methylfuran	12	8068-F1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	14	8068-G1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	16	8068-H1	0.00004	0.001	3.6%	YES	3.7%
22	2-Methylfuran	2	8068-A2	0.00002	0.001	2.2%	YES	3.7%
22	2-Methylfuran	4	8068-B2	0.00002	0.001	2.4%	YES	3.7%
22	2-Methylfuran	6	8068-C2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	8	8068-D2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	10	8068-E2	0.00002	0.001	2.5%	YES	3.7%
22	2-Methylfuran	12	8068-F2	0.00002	0.001	2.3%	YES	3.7%
22	2-Methylfuran	14	8068-G2	0.00002	0.001	2.4%	YES	3.7%
22	2-Methylfuran	16	8068-H2	0.00002	0.001	2.1%	YES	3.7%
23	2,5-Dimethylfuran	2	7837-A1	0.00005	0.001	5.0%	YES	5.2%
23	2,5-Dimethylfuran	4	7837-B1	0.00005	0.001	5.1%	YES	5.2%
23	2,5-Dimethylfuran	6	7837-C1	0.00005	0.001	5.2%	YES	5.2%
23	2,5-Dimethylfuran	8	7837-D1	0.00005	0.001	5.2%	YES	5.2%
23	2,5-Dimethylfuran	10	7837-E1	0.00005	0.001	5.1%	YES	5.2%
23	2,5-Dimethylfuran	12	7837-F1	0.00005	0.001	4.9%	YES	5.2%
23	2,5-Dimethylfuran	14	7837-G1	0.00005	0.001	5.0%	YES	5.2%
23	2,5-Dimethylfuran	16	7837-H1	0.00005	0.001	4.9%	YES	5.2%
23	2,5-Dimethylfuran	2	7837-A2	0.00003	0.001	3.3%	YES	5.2%
23	2,5-Dimethylfuran	4	7837-B2	0.00003	0.001	3.4%	YES	5.2%
23	2,5-Dimethylfuran	6	7837-C2	0.00004	0.001	3.5%	YES	5.2%
23	2,5-Dimethylfuran	8	7837-D2	0.00003	0.001	3.5%	YES	5.2%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
23	2,5-Dimethylfuran	10	7837-E2	0.00003	0.001	3.2%	YES	5.2%
23	2,5-Dimethylfuran	12	7837-F2	0.00003	0.001	3.3%	YES	5.2%
23	2,5-Dimethylfuran	14						5.2%
23	2,5-Dimethylfuran	16	7837-H2	0.00003	0.001	3.2%	YES	5.2%
23	2,5-Dimethylfuran	2	8068-A1	0.00005	0.001	5.0%	YES	5.2%
23	2,5-Dimethylfuran	4	8068-B1	0.00005	0.001	4.9%	YES	5.2%
23	2,5-Dimethylfuran	6						5.2%
23	2,5-Dimethylfuran	8	8068-D1	0.00005	0.001	4.8%	YES	5.2%
23	2,5-Dimethylfuran	10	8068-E1	0.00005	0.001	5.2%	YES	5.2%
23	2,5-Dimethylfuran	12	8068-F1	0.00005	0.001	5.0%	YES	5.2%
23	2,5-Dimethylfuran	14	8068-G1	0.00005	0.001	5.1%	YES	5.2%
23	2,5-Dimethylfuran	16	8068-H1	0.00005	0.001	5.1%	YES	5.2%
23	2,5-Dimethylfuran	2	8068-A2	0.00003	0.001	3.1%	YES	5.2%
23	2,5-Dimethylfuran	4	8068-B2	0.00003	0.001	3.4%	YES	5.2%
23	2,5-Dimethylfuran	6	8068-C2	0.00003	0.001	3.2%	YES	5.2%
23	2,5-Dimethylfuran	8	8068-D2	0.00003	0.001	3.2%	YES	5.2%
23	2,5-Dimethylfuran	10	8068-E2	0.00003	0.001	3.5%	YES	5.2%
23	2,5-Dimethylfuran	12	8068-F2	0.00003	0.001	3.3%	YES	5.2%
23	2,5-Dimethylfuran	14	8068-G2	0.00003	0.001	3.3%	YES	5.2%
23	2,5-Dimethylfuran	16	8068-H2	0.00003	0.001	3.0%	YES	5.2%
27	2-Pentylfuran	2	7837-A1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	4	7837-B1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	6	7837-C1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	8	7837-D1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	10	7837-E1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	12	7837-F1	0.00004	0.001	4.1%	YES	4.3%
27	2-Pentylfuran	14	7837-G1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	16	7837-H1	0.00004	0.001	4.1%	YES	4.3%
27	2-Pentylfuran	2	7837-A2	0.00003	0.001	2.7%	YES	4.3%
27	2-Pentylfuran	4	7837-B2	0.00003	0.001	3.1%		4.3%
27	2-Pentylfuran	6	7837-C2	0.00003	0.001	3.0%	YES	4.3%
27	2-Pentylfuran	8	7837-D2	0.00003	0.001	2.9%	YES	4.3%
27	2-Pentylfuran	10	7837-E2	0.00003	0.001	2.7%	YES	4.3%
27	2-Pentylfuran	12	7837-F2	0.00003	0.001	2.7%	YES	4.3%
27	2-Pentylfuran	14						4.3%
27	2-Pentylfuran	16	7837-H2	0.00003	0.001	2.7%	YES	4.3%
27	2-Pentylfuran	2	8068-A1	0.00006	0.001	5.5%		4.3%
27	2-Pentylfuran	4	8068-B1	0.00006	0.001	6.3%		4.3%
27	2-Pentylfuran	6						4.3%
27	2-Pentylfuran	8	8068-D1	0.00004	0.001	4.0%	YES	4.3%
27	2-Pentylfuran	10	8068-E1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	12	8068-F1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	14	8068-G1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	16	8068-H1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	2	8068-A2	0.00003	0.001	2.9%		4.3%
27	2-Pentylfuran	4	8068-B2	0.00003	0.001	2.8%	YES	4.3%
27	2-Pentylfuran	6	8068-C2	0.00004	0.001	4.5%		4.3%
27	2-Pentylfuran	8	8068-D2	0.00004	0.001	3.9%		4.3%
27	2-Pentylfuran	10	8068-E2	0.00003	0.001	2.9%	YES	4.3%
27	2-Pentylfuran	12	8068-F2	0.00003	0.001	2.7%	YES	4.3%
27	2-Pentylfuran	14	8068-G2	0.00004	0.001	3.7%		4.3%
27	2-Pentylfuran	16	8068-H2	0.00002	0.001	2.5%	YES	4.3%
28	2-Heptylfuran	2	7837-A1	0.00003	0.001	3.3%	YES	3.4%
28	2-Heptylfuran	4	7837-B1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	6	7837-C1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	8	7837-D1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	10	7837-E1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	12	7837-F1	0.00003	0.001	3.3%	YES	3.4%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
28	2-Heptylfuran	14	7837-G1	0.00003	0.001	3.3%	YES	3.4%
28	2-Heptylfuran	16	7837-H1	0.00003	0.001	3.3%	YES	3.4%
28	2-Heptylfuran	2	7837-A2	0.00002	0.001	2.2%	YES	3.4%
28	2-Heptylfuran	4	7837-B2	0.00002	0.001	2.3%	YES	3.4%
28	2-Heptylfuran	6	7837-C2	0.00002	0.001	2.4%	YES	3.4%
28	2-Heptylfuran	8	7837-D2	0.00002	0.001	2.3%	YES	3.4%
28	2-Heptylfuran	10	7837-E2	0.00002	0.001	2.1%	YES	3.4%
28	2-Heptylfuran	12	7837-F2	0.00002	0.001	2.2%	YES	3.4%
28	2-Heptylfuran	14						3.4%
28	2-Heptylfuran	16	7837-H2	0.00002	0.001	2.1%	YES	3.4%
28	2-Heptylfuran	2	8068-A1	0.00003	0.001	3.3%	YES	3.4%
28	2-Heptylfuran	4	8068-B1	0.00003	0.001	3.2%	YES	3.4%
28	2-Heptylfuran	6						3.4%
28	2-Heptylfuran	8	8068-D1	0.00003	0.001	3.2%	YES	3.4%
28	2-Heptylfuran	10	8068-E1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	12	8068-F1	0.00003	0.001	3.3%	YES	3.4%
28	2-Heptylfuran	14	8068-G1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	16	8068-H1	0.00003	0.001	3.4%	YES	3.4%
28	2-Heptylfuran	2	8068-A2	0.00003	0.001	2.6%		3.4%
28	2-Heptylfuran	4	8068-B2	0.00002	0.001	2.3%		3.4%
28	2-Heptylfuran	6	8068-C2	0.00003	0.001	2.7%		3.4%
28	2-Heptylfuran	8	8068-D2	0.00003	0.001	2.7%		3.4%
28	2-Heptylfuran	10	8068-E2	0.00002	0.001	2.3%	YES	3.4%
28	2-Heptylfuran	12	8068-F2	0.00002	0.001	2.2%	YES	3.4%
28	2-Heptylfuran	14	8068-G2	0.00002	0.001	2.2%		3.4%
28	2-Heptylfuran	16	8068-H2	0.00002	0.001	2.0%	YES	3.4%
29	2-Propylfuran	2	7837-A1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	4	7837-B1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	6	7837-C1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	8	7837-D1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	10	7837-E1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	12	7837-F1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	14	7837-G1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	16	7837-H1	0.00004	0.001	3.5%	YES	3.7%
29	2-Propylfuran	2	7837-A2	0.00002	0.001	2.4%	YES	3.7%
29	2-Propylfuran	4	7837-B2	0.00002	0.001	2.5%	YES	3.7%
29	2-Propylfuran	6	7837-C2	0.00003	0.001	2.6%	YES	3.7%
29	2-Propylfuran	8	7837-D2	0.00003	0.001	2.5%	YES	3.7%
29	2-Propylfuran	10	7837-E2	0.00002	0.001	2.3%	YES	3.7%
29	2-Propylfuran	12	7837-F2	0.00002	0.001	2.4%	YES	3.7%
29	2-Propylfuran	14						3.7%
29	2-Propylfuran	16	7837-H2	0.00002	0.001	2.3%	YES	3.7%
29	2-Propylfuran	2	8068-A1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	4	8068-B1	0.00004	0.001	3.5%	YES	3.7%
29	2-Propylfuran	6						3.7%
29	2-Propylfuran	8	8068-D1	0.00003	0.001	3.5%	YES	3.7%
29	2-Propylfuran	10	8068-E1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	12	8068-F1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	14	8068-G1	0.00004	0.001	3.6%	YES	3.7%
29	2-Propylfuran	16	8068-H1	0.00004	0.001	3.7%	YES	3.7%
29	2-Propylfuran	2	8068-A2	0.00002	0.001	2.2%	YES	3.7%
29	2-Propylfuran	4	8068-B2	0.00002	0.001	2.4%	YES	3.7%
29	2-Propylfuran	6	8068-C2	0.00002	0.001	2.3%	YES	3.7%
29	2-Propylfuran	8	8068-D2	0.00002	0.001	2.3%	YES	3.7%
29	2-Propylfuran	10	8068-E2	0.00003	0.001	2.5%	YES	3.7%
29	2-Propylfuran	12	8068-F2	0.00002	0.001	2.4%	YES	3.7%
29	2-Propylfuran	14	8068-G2	0.00002	0.001	2.4%	YES	3.7%
29	2-Propylfuran	16	8068-H2	0.00002	0.001	2.2%	YES	3.7%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
33	Diethylphthalate	2	7837-A1	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	4	7837-B1	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	6	7837-C1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	8	7837-D1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	10	7837-E1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	12	7837-F1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	14	7837-G1	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	16	7837-H1	0.00019	0.55	0.03%	YES	0.04%
33	Diethylphthalate	2	7837-A2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	4	7837-B2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	6	7837-C2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	8	7837-D2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	10	7837-E2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	12	7837-F2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	14	7837-G2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	16	7837-H2	0.00020	0.55	0.04%	YES	0.04%
33	Diethylphthalate	2						0.04%
33	Diethylphthalate	4	8068-B1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	6	8068-C1	0.00022	0.55	0.04%	YES	0.04%
33	Diethylphthalate	8	8068-D1	0.00023	0.55	0.04%	YES	0.04%
33	Diethylphthalate	10	8068-E1	0.00022	0.55	0.04%	YES	0.04%
33	Diethylphthalate	12						0.04%
33	Diethylphthalate	14						0.04%
33	Diethylphthalate	16	8068-H1	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	2	8068-A2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	4	8068-B2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	6	8068-C2	0.00022	0.55	0.04%	YES	0.04%
33	Diethylphthalate	8	8068-D2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	10	8068-E2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	12	8068-F2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	14	8068-G2	0.00021	0.55	0.04%	YES	0.04%
33	Diethylphthalate	16	8068-H2	0.00021	0.55	0.04%	YES	0.04%
34	Acetonitrile	2	7837-A1	0.052	20	0.26%		0.002%
34	Acetonitrile	4	7837-B1	0.075	20	0.37%		0.002%
34	Acetonitrile	6	7837-C1	0.078	20	0.39%		0.002%
34	Acetonitrile	8	7837-D1	0.068	20	0.34%		0.002%
34	Acetonitrile	10	7837-E1	0.018	20	0.09%		0.002%
34	Acetonitrile	12	7837-F1	0.063	20	0.32%		0.002%
34	Acetonitrile	14	7837-G1	0.089	20	0.45%		0.002%
34	Acetonitrile	16	7837-H1	0.071	20	0.36%		0.002%
34	Acetonitrile	2	7837-A2	0.010	20	0.05%		0.002%
34	Acetonitrile	4	7837-B2	0.035	20	0.17%		0.002%
34	Acetonitrile	6	7837-C2	0.044	20	0.22%		0.002%
34	Acetonitrile	8	7837-D2	0.196	20	0.98%		0.002%
34	Acetonitrile	10	7837-E2	0.059	20	0.30%		0.002%
34	Acetonitrile	12	7837-F2	0.053	20	0.26%		0.002%
34	Acetonitrile	14	7837-G2	0.075	20	0.38%		0.002%
34	Acetonitrile	16	7837-H2	0.099	20	0.49%		0.002%
34	Acetonitrile	2	8068-A1	0.138	20	0.69%		0.002%
34	Acetonitrile	4	8068-B1	0.150	20	0.75%		0.002%
34	Acetonitrile	6	8068-C1	0.154	20	0.77%		0.002%
34	Acetonitrile	8	8068-D1	0.161	20	0.81%		0.002%
34	Acetonitrile	10	8068-E1	0.170	20	0.85%		0.002%
34	Acetonitrile	12	8068-F1	0.114	20	0.57%		0.002%
34	Acetonitrile	14	8068-G1	0.509	20	2.5%		0.002%
34	Acetonitrile	16	8068-H1	0.340	20	1.7%		0.002%
34	Acetonitrile	2	8068-A2	0.078	20	0.39%		0.002%
34	Acetonitrile	4	8068-B2	0.098	20	0.49%		0.002%
34	Acetonitrile	6	8068-C2	0.156	20	0.78%		0.002%
34	Acetonitrile	8	8068-D2	4.154	20	20.8%		0.002%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
34	Acetonitrile	10	8068-E2	0.166	20	0.83%		0.002%
34	Acetonitrile	12	8068-F2	0.167	20	0.83%		0.002%
34	Acetonitrile	14	8068-G2	0.187	20	0.93%		0.002%
34	Acetonitrile	16	8068-H2	0.106	20	0.53%		0.002%
35	Propanenitrile	2	7837-A1	0.00803	6.0	0.134%		0.003%
35	Propanenitrile	4	7837-B1	0.00955	6.0	0.159%		0.003%
35	Propanenitrile	6	7837-C1	0.00890	6.0	0.148%		0.003%
35	Propanenitrile	8	7837-D1	0.00797	6.0	0.133%		0.003%
35	Propanenitrile	10	7837-E1	0.00732	6.0	0.122%		0.003%
35	Propanenitrile	12	7837-F1	0.00687	6.0	0.115%		0.003%
35	Propanenitrile	14	7837-G1	0.00641	6.0	0.107%		0.003%
35	Propanenitrile	16	7837-H1	0.00791	6.0	0.132%		0.003%
35	Propanenitrile	2	7837-A2	0.00017	6.0	0.003%	YES	0.003%
35	Propanenitrile	4	7837-B2	0.00017	6.0	0.003%	YES	0.003%
35	Propanenitrile	6	7837-C2	0.00017	6.0	0.003%	YES	0.003%
35	Propanenitrile	8	7837-D2	0.00017	6.0	0.003%	YES	0.003%
35	Propanenitrile	10	7837-E2	0.00027	6.0	0.005%		0.003%
35	Propanenitrile	12	7837-F2	0.00032	6.0	0.005%		0.003%
35	Propanenitrile	14	7837-G2	0.00149	6.0	0.025%		0.003%
35	Propanenitrile	16	7837-H2	0.00328	6.0	0.055%		0.003%
35	Propanenitrile	2	8068-A1	0.00669	6.0	0.111%		0.003%
35	Propanenitrile	4	8068-B1	0.00712	6.0	0.119%		0.003%
35	Propanenitrile	6	8068-C1	0.00806	6.0	0.134%		0.003%
35	Propanenitrile	8	8068-D1	0.00768	6.0	0.128%		0.003%
35	Propanenitrile	10	8068-E1	0.00825	6.0	0.137%		0.003%
35	Propanenitrile	12	8068-F1	0.00592	6.0	0.099%		0.003%
35	Propanenitrile	14	8068-G1	0.00557	6.0	0.093%		0.003%
35	Propanenitrile	16	8068-H1	0.00447	6.0	0.074%		0.003%
35	Propanenitrile	2	8068-A2	0.00016	6.0	0.003%	YES	0.003%
35	Propanenitrile	4	8068-B2	0.00019	6.0	0.003%	YES	0.003%
35	Propanenitrile	6	8068-C2	0.00018	6.0	0.003%	YES	0.003%
35	Propanenitrile	8	8068-D2	0.00074	6.0	0.012%		0.003%
35	Propanenitrile	10	8068-E2	0.00032	6.0	0.005%		0.003%
35	Propanenitrile	12	8068-F2	0.00045	6.0	0.008%		0.003%
35	Propanenitrile	14	8068-G2	0.00128	6.0	0.021%		0.003%
35	Propanenitrile	16	8068-H2	0.00459	6.0	0.077%		0.003%
36	Butanenitrile	2	7837-A1	0.00448	8.0	0.056%		0.002%
36	Butanenitrile	4	7837-B1	0.00478	8.0	0.060%		0.002%
36	Butanenitrile	6	7837-C1	0.00466	8.0	0.058%		0.002%
36	Butanenitrile	8	7837-D1	0.00385	8.0	0.048%		0.002%
36	Butanenitrile	10	7837-E1	0.00341	8.0	0.043%		0.002%
36	Butanenitrile	12	7837-F1	0.00323	8.0	0.040%		0.002%
36	Butanenitrile	14	7837-G1	0.00317	8.0	0.040%		0.002%
36	Butanenitrile	16	7837-H1	0.00342	8.0	0.043%		0.002%
36	Butanenitrile	2	7837-A2	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	4	7837-B2	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	6	7837-C2	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	8	7837-D2	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	10	7837-E2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	12	7837-F2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	14	7837-G2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	16	7837-H2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	2	8068-A1	0.00377	8.0	0.047%		0.002%
36	Butanenitrile	4	8068-B1	0.00475	8.0	0.059%		0.002%
36	Butanenitrile	6	8068-C1	0.00514	8.0	0.064%		0.002%
36	Butanenitrile	8	8068-D1	0.00415	8.0	0.052%		0.002%
36	Butanenitrile	10	8068-E1	0.00415	8.0	0.052%		0.002%
36	Butanenitrile	12	8068-F1	0.00292	8.0	0.037%		0.002%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
36	Butanenitrile	14	8068-G1	0.00284	8.0	0.035%		0.002%
36	Butanenitrile	16	8068-H1	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	2	8068-A2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	4	8068-B2	0.00013	8.0	0.002%	YES	0.002%
36	Butanenitrile	6	8068-C2	0.00012	8.0	0.002%	YES	0.002%
36	Butanenitrile	8	8068-D2	0.00013	8.0	0.002%	YES	0.002%
36	Butanenitrile	10	8068-E2	0.00012	8.0	0.001%	YES	0.002%
36	Butanenitrile	12	8068-F2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	14	8068-G2	0.00011	8.0	0.001%	YES	0.002%
36	Butanenitrile	16	8068-H2	0.00202	8.0	0.025%		0.002%
37	Pentanenitrile	2	7837-A1	0.00091	6.0	0.015%		0.002%
37	Pentanenitrile	4	7837-B1	0.00125	6.0	0.021%		0.002%
37	Pentanenitrile	6	7837-C1	0.00118	6.0	0.020%		0.002%
37	Pentanenitrile	8	7837-D1	0.00088	6.0	0.015%		0.002%
37	Pentanenitrile	10	7837-E1	0.00112	6.0	0.019%		0.002%
37	Pentanenitrile	12	7837-F1	0.00082	6.0	0.014%		0.002%
37	Pentanenitrile	14	7837-G1	0.00070	6.0	0.012%		0.002%
37	Pentanenitrile	16	7837-H1	0.00097	6.0	0.016%		0.002%
37	Pentanenitrile	2	7837-A2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	4	7837-B2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	6	7837-C2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	8	7837-D2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	10	7837-E2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	12	7837-F2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	14	7837-G2	0.00012	6.0	0.002%	YES	0.002%
37	Pentanenitrile	16	7837-H2	0.00012	6.0	0.002%	YES	0.002%
37	Pentanenitrile	2	8068-A1	0.00092	6.0	0.015%		0.002%
37	Pentanenitrile	4	8068-B1	0.00124	6.0	0.021%		0.002%
37	Pentanenitrile	6	8068-C1	0.00137	6.0	0.023%		0.002%
37	Pentanenitrile	8	8068-D1	0.00115	6.0	0.019%		0.002%
37	Pentanenitrile	10	8068-E1	0.00084	6.0	0.014%		0.002%
37	Pentanenitrile	12	8068-F1	0.00067	6.0	0.011%		0.002%
37	Pentanenitrile	14	8068-G1	0.00086	6.0	0.014%		0.002%
37	Pentanenitrile	16	8068-H1	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	2	8068-A2	0.00012	6.0	0.002%	YES	0.002%
37	Pentanenitrile	4	8068-B2	0.00014	6.0	0.002%	YES	0.002%
37	Pentanenitrile	6	8068-C2	0.00014	6.0	0.002%	YES	0.002%
37	Pentanenitrile	8	8068-D2	0.00014	6.0	0.002%	YES	0.002%
37	Pentanenitrile	10	8068-E2	0.00013	6.0	0.002%	YES	0.002%
37	Pentanenitrile	12	8068-F2	0.00012	6.0	0.002%	YES	0.002%
37	Pentanenitrile	14	8068-G2	0.00012	6.0	0.002%	YES	0.002%
37	Pentanenitrile	16	8068-H2	0.00043	6.0	0.007%		0.002%
38	Hexanenitrile	2	7837-A1	0.00605	6.0	0.101%		0.002%
38	Hexanenitrile	4	7837-B1	0.01007	6.0	0.168%		0.002%
38	Hexanenitrile	6	7837-C1	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	8	7837-D1	0.00822	6.0	0.137%		0.002%
38	Hexanenitrile	10	7837-E1	0.01022	6.0	0.170%		0.002%
38	Hexanenitrile	12	7837-F1	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	14	7837-G1	0.00015	6.0	0.003%		0.002%
38	Hexanenitrile	16	7837-H1	0.00019	6.0	0.003%		0.002%
38	Hexanenitrile	2	7837-A2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	4	7837-B2	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	6	7837-C2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	8	7837-D2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	10	7837-E2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	12	7837-F2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	14	7837-G2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	16	7837-H2	0.00010	6.0	0.002%	YES	0.002%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
38	Hexanenitrile	2	8068-A1	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	4	8068-B1	0.00043	6.0	0.007%		0.002%
38	Hexanenitrile	6	8068-C1	0.00034	6.0	0.006%		0.002%
38	Hexanenitrile	8	8068-D1	0.00039	6.0	0.007%		0.002%
38	Hexanenitrile	10	8068-E1	0.00026	6.0	0.004%		0.002%
38	Hexanenitrile	12	8068-F1	0.00017	6.0	0.003%		0.002%
38	Hexanenitrile	14	8068-G1	0.00015	6.0	0.003%		0.002%
38	Hexanenitrile	16	8068-H1	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	2	8068-A2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	4	8068-B2	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	6	8068-C2	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	8	8068-D2	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	10	8068-E2	0.00011	6.0	0.002%	YES	0.002%
38	Hexanenitrile	12	8068-F2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	14	8068-G2	0.00010	6.0	0.002%	YES	0.002%
38	Hexanenitrile	16	8068-H2	0.00012	6.0	0.002%		0.002%
42	Ethylamine	2	7837-A1	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	4	7837-B1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	6	7837-C1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	8	7837-D1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	10	7837-E1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	12	7837-F1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	14	7837-G1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	16	7837-H1	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	2	7837-A2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	4	7837-B2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	6	7837-C2	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	8	7837-D2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	10	7837-E2	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	12	7837-F2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	7837-G2	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	16	7837-H2	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	2	8068-A1	0.0043	5	0.09%	YES	0.10%
42	Ethylamine	4	8068-B1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	6	8068-C1	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	8	8068-D1	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	10	8068-E1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8068-F1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8068-G1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	16	8068-H1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	2	8068-A2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	4	8068-B2	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	6	8068-C2	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	8	8068-D2	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	10	8068-E2	0.0049	5	0.10%	YES	0.10%
42	Ethylamine	12	8068-F2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8068-G2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	16	8068-H2	0.0048	5	0.10%	YES	0.10%
43	N-Nitrosodimethylamine	2	7837-A1	0.00211	0.0003	703%		11.2%
43	N-Nitrosodimethylamine	4	7837-B1	0.00251	0.0003	838%		11.2%
43	N-Nitrosodimethylamine	6	7837-C1	0.00241	0.0003	804%		11.2%
43	N-Nitrosodimethylamine	8	7837-D1	0.00207	0.0003	689%		11.2%
43	N-Nitrosodimethylamine	10	7837-E1	0.00167	0.0003	558%		11.2%
43	N-Nitrosodimethylamine	12	7837-F1	0.00190	0.0003	634%		11.2%
43	N-Nitrosodimethylamine	14	7837-G1	0.00159	0.0003	529%		11.2%
43	N-Nitrosodimethylamine	16	7837-H1	0.00126	0.0003	420%		11.2%
43	N-Nitrosodimethylamine	2	7837-A2	0.00003	0.0003	10.8%	YES	11.2%
43	N-Nitrosodimethylamine	4	7837-B2	0.00003	0.0003	11.0%	YES	11.2%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
43	N-Nitrosodimethylamine	6	7837-C2	0.00003	0.0003	11.2%	YES	11.2%
43	N-Nitrosodimethylamine	8	7837-D2	0.00003	0.0003	10.8%	YES	11.2%
43	N-Nitrosodimethylamine	10	7837-E2	0.00003	0.0003	10.6%	YES	11.2%
43	N-Nitrosodimethylamine	12	7837-F2	0.00003	0.0003	10.6%	YES	11.2%
43	N-Nitrosodimethylamine	14	7837-G2	0.00003	0.0003	10.3%	YES	11.2%
43	N-Nitrosodimethylamine	16	7837-H2	0.00003	0.0003	10.1%	YES	11.2%
43	N-Nitrosodimethylamine	2	8068-A1	0.00149	0.0003	496%		11.2%
43	N-Nitrosodimethylamine	4	8068-B1	0.00233	0.0003	776%		11.2%
43	N-Nitrosodimethylamine	6	8068-C1	0.00260	0.0003	868%		11.2%
43	N-Nitrosodimethylamine	8	8068-D1	0.00280	0.0003	932%		11.2%
43	N-Nitrosodimethylamine	10	8068-E1	0.00240	0.0003	802%		11.2%
43	N-Nitrosodimethylamine	12	8068-F1	0.00188	0.0003	625%		11.2%
43	N-Nitrosodimethylamine	14	8068-G1	0.00176	0.0003	588%		11.2%
43	N-Nitrosodimethylamine	16	8068-H1	0.00003	0.0003	9.8%	YES	11.2%
43	N-Nitrosodimethylamine	2	8068-A2	0.00003	0.0003	10.2%	YES	11.2%
43	N-Nitrosodimethylamine	4	8068-B2	0.00003	0.0003	10.4%	YES	11.2%
43	N-Nitrosodimethylamine	6	8068-C2	0.00003	0.0003	10.5%	YES	11.2%
43	N-Nitrosodimethylamine	8	8068-D2	0.00003	0.0003	10.5%	YES	11.2%
43	N-Nitrosodimethylamine	10	8068-E2	0.00003	0.0003	10.2%	YES	11.2%
43	N-Nitrosodimethylamine	12	8068-F2	0.00003	0.0003	9.8%	YES	11.2%
43	N-Nitrosodimethylamine	14	8068-G2	0.00003	0.0003	9.6%	YES	11.2%
43	N-Nitrosodimethylamine	16	8068-H2	0.00193	0.0003	644%		11.2%
44	N-Nitrosodiethylamine	2	7837-A1	0.00002	0.0001	21.7%	YES	23.2%
44	N-Nitrosodiethylamine	4	7837-B1	0.00002	0.0001	22.0%	YES	23.2%
44	N-Nitrosodiethylamine	6	7837-C1	0.00002	0.0001	22.5%	YES	23.2%
44	N-Nitrosodiethylamine	8	7837-D1	0.00002	0.0001	22.2%	YES	23.2%
44	N-Nitrosodiethylamine	10	7837-E1	0.00002	0.0001	21.9%	YES	23.2%
44	N-Nitrosodiethylamine	12	7837-F1	0.00002	0.0001	21.7%	YES	23.2%
44	N-Nitrosodiethylamine	14	7837-G1	0.00002	0.0001	21.6%	YES	23.2%
44	N-Nitrosodiethylamine	16	7837-H1	0.00002	0.0001	21.3%	YES	23.2%
44	N-Nitrosodiethylamine	2	7837-A2	0.00002	0.0001	22.5%	YES	23.2%
44	N-Nitrosodiethylamine	4	7837-B2	0.00002	0.0001	22.8%	YES	23.2%
44	N-Nitrosodiethylamine	6	7837-C2	0.00002	0.0001	23.2%	YES	23.2%
44	N-Nitrosodiethylamine	8	7837-D2	0.00002	0.0001	22.3%	YES	23.2%
44	N-Nitrosodiethylamine	10	7837-E2	0.00002	0.0001	22.1%	YES	23.2%
44	N-Nitrosodiethylamine	12	7837-F2	0.00002	0.0001	22.0%	YES	23.2%
44	N-Nitrosodiethylamine	14	7837-G2	0.00002	0.0001	21.3%	YES	23.2%
44	N-Nitrosodiethylamine	16	7837-H2	0.00002	0.0001	20.9%	YES	23.2%
44	N-Nitrosodiethylamine	2	8068-A1	0.00002	0.0001	21.8%	YES	23.2%
44	N-Nitrosodiethylamine	4	8068-B1	0.00002	0.0001	22.3%	YES	23.2%
44	N-Nitrosodiethylamine	6	8068-C1	0.00002	0.0001	23.0%	YES	23.2%
44	N-Nitrosodiethylamine	8	8068-D1	0.00002	0.0001	22.9%	YES	23.2%
44	N-Nitrosodiethylamine	10	8068-E1	0.00002	0.0001	21.9%	YES	23.2%
44	N-Nitrosodiethylamine	12	8068-F1	0.00002	0.0001	21.3%	YES	23.2%
44	N-Nitrosodiethylamine	14	8068-G1	0.00002	0.0001	21.4%	YES	23.2%
44	N-Nitrosodiethylamine	16	8068-H1	0.00002	0.0001	21.4%	YES	23.2%
44	N-Nitrosodiethylamine	2	8068-A2	0.00002	0.0001	22.3%	YES	23.2%
44	N-Nitrosodiethylamine	4	8068-B2	0.00002	0.0001	22.6%	YES	23.2%
44	N-Nitrosodiethylamine	6	8068-C2	0.00002	0.0001	22.9%	YES	23.2%
44	N-Nitrosodiethylamine	8	8068-D2	0.00002	0.0001	22.8%	YES	23.2%
44	N-Nitrosodiethylamine	10	8068-E2	0.00002	0.0001	22.1%	YES	23.2%
44	N-Nitrosodiethylamine	12	8068-F2	0.00002	0.0001	21.4%	YES	23.2%
44	N-Nitrosodiethylamine	14	8068-G2	0.00002	0.0001	21.0%	YES	23.2%
44	N-Nitrosodiethylamine	16	8068-H2	0.00002	0.0001	21.0%	YES	23.2%
45	N-Nitrosomethylethylamine	2	7837-A1	0.00004	0.0003	13.6%		8.9%
45	N-Nitrosomethylethylamine	4	7837-B1	0.00004	0.0003	15.0%		8.9%
45	N-Nitrosomethylethylamine	6	7837-C1	0.00004	0.0003	14.0%		8.9%
45	N-Nitrosomethylethylamine	8	7837-D1	0.00003	0.0003	9.0%		8.9%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
45	N-Nitrosomethylethylamine	10	7837-E1	0.00003	0.0003	8.5%	YES	8.9%
45	N-Nitrosomethylethylamine	12	7837-F1	0.00003	0.0003	8.4%	YES	8.9%
45	N-Nitrosomethylethylamine	14	7837-G1	0.00002	0.0003	8.3%	YES	8.9%
45	N-Nitrosomethylethylamine	16	7837-H1	0.00002	0.0003	8.2%	YES	8.9%
45	N-Nitrosomethylethylamine	2	7837-A2	0.00003	0.0003	8.7%	YES	8.9%
45	N-Nitrosomethylethylamine	4	7837-B2	0.00003	0.0003	8.8%	YES	8.9%
45	N-Nitrosomethylethylamine	6	7837-C2	0.00003	0.0003	8.9%	YES	8.9%
45	N-Nitrosomethylethylamine	8	7837-D2	0.00003	0.0003	8.6%	YES	8.9%
45	N-Nitrosomethylethylamine	10	7837-E2	0.00003	0.0003	8.5%	YES	8.9%
45	N-Nitrosomethylethylamine	12	7837-F2	0.00003	0.0003	8.5%	YES	8.9%
45	N-Nitrosomethylethylamine	14	7837-G2	0.00002	0.0003	8.2%	YES	8.9%
45	N-Nitrosomethylethylamine	16	7837-H2	0.00002	0.0003	8.1%	YES	8.9%
45	N-Nitrosomethylethylamine	2	8068-A1	0.00002	0.0003	8.0%	YES	8.9%
45	N-Nitrosomethylethylamine	4	8068-B1	0.00004	0.0003	14.7%		8.9%
45	N-Nitrosomethylethylamine	6	8068-C1	0.00005	0.0003	15.5%		8.9%
45	N-Nitrosomethylethylamine	8	8068-D1	0.00005	0.0003	15.5%		8.9%
45	N-Nitrosomethylethylamine	10	8068-E1	0.00004	0.0003	12.7%		8.9%
45	N-Nitrosomethylethylamine	12	8068-F1	0.00003	0.0003	9.9%		8.9%
45	N-Nitrosomethylethylamine	14	8068-G1	0.00002	0.0003	7.8%	YES	8.9%
45	N-Nitrosomethylethylamine	16	8068-H1	0.00002	0.0003	7.9%	YES	8.9%
45	N-Nitrosomethylethylamine	2	8068-A2	0.00002	0.0003	8.2%	YES	8.9%
45	N-Nitrosomethylethylamine	4	8068-B2	0.00002	0.0003	8.3%	YES	8.9%
45	N-Nitrosomethylethylamine	6	8068-C2	0.00003	0.0003	8.4%	YES	8.9%
45	N-Nitrosomethylethylamine	8	8068-D2	0.00003	0.0003	8.4%	YES	8.9%
45	N-Nitrosomethylethylamine	10	8068-E2	0.00002	0.0003	8.1%	YES	8.9%
45	N-Nitrosomethylethylamine	12	8068-F2	0.00002	0.0003	7.9%	YES	8.9%
45	N-Nitrosomethylethylamine	14	8068-G2	0.00002	0.0003	7.7%	YES	8.9%
45	N-Nitrosomethylethylamine	16	8068-H2	0.00002	0.0003	7.7%		8.9%
46	N-Nitrosomorpholine	2	7837-A1	0.00006	0.0006	10.1%		3.4%
46	N-Nitrosomorpholine	4	7837-B1	0.00006	0.0006	9.5%		3.4%
46	N-Nitrosomorpholine	6	7837-C1	0.00005	0.0006	8.5%		3.4%
46	N-Nitrosomorpholine	8	7837-D1	0.00006	0.0006	9.3%		3.4%
46	N-Nitrosomorpholine	10	7837-E1	0.00005	0.0006	8.0%		3.4%
46	N-Nitrosomorpholine	12	7837-F1	0.00003	0.0006	4.7%		3.4%
46	N-Nitrosomorpholine	14	7837-G1	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	16	7837-H1	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	2	7837-A2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	4	7837-B2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	6	7837-C2	0.00002	0.0006	3.4%	YES	3.4%
46	N-Nitrosomorpholine	8	7837-D2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	10	7837-E2	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	12	7837-F2	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	14	7837-G2	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	16	7837-H2	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	2	8068-A1	0.00009	0.0006	14.4%		3.4%
46	N-Nitrosomorpholine	4	8068-B1	0.00006	0.0006	9.5%		3.4%
46	N-Nitrosomorpholine	6	8068-C1	0.00006	0.0006	9.3%		3.4%
46	N-Nitrosomorpholine	8	8068-D1	0.00006	0.0006	10.4%		3.4%
46	N-Nitrosomorpholine	10	8068-E1	0.00003	0.0006	5.6%		3.4%
46	N-Nitrosomorpholine	12	8068-F1	0.00003	0.0006	5.6%		3.4%
46	N-Nitrosomorpholine	14	8068-G1	0.00003	0.0006	4.9%		3.4%
46	N-Nitrosomorpholine	16	8068-H1	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	2	8068-A2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	4	8068-B2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	6	8068-C2	0.00002	0.0006	3.4%	YES	3.4%
46	N-Nitrosomorpholine	8	8068-D2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine	10	8068-E2	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	12	8068-F2	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	14	8068-G2	0.00002	0.0006	3.1%	YES	3.4%
46	N-Nitrosomorpholine	16	8068-H2	0.00005	0.0006	7.9%		3.4%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
47	Tributyl phosphate	2	7837-A1	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	4	7837-B1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	6	7837-C1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	8	7837-D1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	10	7837-E1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	12	7837-F1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	14	7837-G1	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	16	7837-H1	0.00012	0.20	0.06%	YES	0.078%
47	Tributyl phosphate	2	7837-A2	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	4	7837-B2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	6	7837-C2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	8	7837-D2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	10	7837-E2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	12	7837-F2	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	14	7837-G2	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	16	7837-H2	0.00013	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	2	8068-A1					0.078%
47	Tributyl phosphate	4	8068-B1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	6	8068-C1	0.00015	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	8	8068-D1	0.00016	0.20	0.08%	YES	0.078%
47	Tributyl phosphate	10	8068-E1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	12						0.078%
47	Tributyl phosphate	14						0.078%
47	Tributyl phosphate	16	8068-H1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	2	8068-A2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	4	8068-B2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	6	8068-C2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	8	8068-D2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	10	8068-E2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	12	8068-F2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	14	8068-G2	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	16	8068-H2	0.00014	0.20	0.07%	YES	0.078%
48	Dibutyl butylphosphonate	2	7837-A1	0.00009	0.007	1.31%	YES	1.51%
48	Dibutyl butylphosphonate	4	7837-B1	0.00009	0.007	1.32%	YES	1.51%
48	Dibutyl butylphosphonate	6	7837-C1	0.00009	0.007	1.34%	YES	1.51%
48	Dibutyl butylphosphonate	8	7837-D1	0.00010	0.007	1.38%	YES	1.51%
48	Dibutyl butylphosphonate	10	7837-E1	0.00009	0.007	1.35%	YES	1.51%
48	Dibutyl butylphosphonate	12	7837-F1	0.00009	0.007	1.35%	YES	1.51%
48	Dibutyl butylphosphonate	14	7837-G1	0.00009	0.007	1.28%	YES	1.51%
48	Dibutyl butylphosphonate	16	7837-H1	0.00008	0.007	1.21%	YES	1.51%
48	Dibutyl butylphosphonate	2	7837-A2	0.00009	0.007	1.32%	YES	1.51%
48	Dibutyl butylphosphonate	4	7837-B2	0.00009	0.007	1.32%	YES	1.51%
48	Dibutyl butylphosphonate	6	7837-C2	0.00009	0.007	1.33%	YES	1.51%
48	Dibutyl butylphosphonate	8	7837-D2	0.00009	0.007	1.35%	YES	1.51%
48	Dibutyl butylphosphonate	10	7837-E2	0.00010	0.007	1.37%	YES	1.51%
48	Dibutyl butylphosphonate	12	7837-F2	0.00009	0.007	1.30%	YES	1.51%
48	Dibutyl butylphosphonate	14	7837-G2	0.00009	0.007	1.30%	YES	1.51%
48	Dibutyl butylphosphonate	16	7837-H2	0.00009	0.007	1.29%	YES	1.51%
48	Dibutyl butylphosphonate	2	8068-A1					1.51%
48	Dibutyl butylphosphonate	4	8068-B1	0.00010	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	6	8068-C1	0.00010	0.007	1.43%	YES	1.51%
48	Dibutyl butylphosphonate	8	8068-D1	0.00011	0.007	1.51%	YES	1.51%
48	Dibutyl butylphosphonate	10	8068-E1	0.00010	0.007	1.41%	YES	1.51%
48	Dibutyl butylphosphonate	12						1.51%
48	Dibutyl butylphosphonate	14						1.51%
48	Dibutyl butylphosphonate	16	8068-H1	0.00009	0.007	1.35%	YES	1.51%
48	Dibutyl butylphosphonate	2	8068-A2	0.00010	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	4	8068-B2	0.00009	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	6	8068-C2	0.00010	0.007	1.41%	YES	1.51%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
48	Dibutyl butylphosphonate	8	8068-D2	0.00010	0.007	1.40%	YES	1.51%
48	Dibutyl butylphosphonate	10	8068-E2	0.00010	0.007	1.38%	YES	1.51%
48	Dibutyl butylphosphonate	12	8068-F2	0.00010	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	14	8068-G2	0.00010	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	16	8068-H2	0.00010	0.007	1.36%	YES	1.51%
51	Pyridine	2	7837-A1	0.00152	1.0	0.152%		0.036%
51	Pyridine	4	7837-B1	0.00217	1.0	0.217%		0.036%
51	Pyridine	6	7837-C1	0.00204	1.0	0.204%		0.036%
51	Pyridine	8	7837-D1	0.00109	1.0	0.109%		0.036%
51	Pyridine	10	7837-E1	0.00173	1.0	0.173%		0.036%
51	Pyridine	12	7837-F1	0.00102	1.0	0.102%		0.036%
51	Pyridine	14	7837-G1	0.00115	1.0	0.115%		0.036%
51	Pyridine	16	7837-H1	0.00126	1.0	0.126%		0.036%
51	Pyridine	2	7837-A2	0.00032	1.0	0.032%	YES	0.036%
51	Pyridine	4	7837-B2	0.00033	1.0	0.033%	YES	0.036%
51	Pyridine	6	7837-C2	0.00032	1.0	0.032%	YES	0.036%
51	Pyridine	8	7837-D2	0.00032	1.0	0.032%	YES	0.036%
51	Pyridine	10	7837-E2	0.00031	1.0	0.031%	YES	0.036%
51	Pyridine	12	7837-F2	0.00031	1.0	0.031%	YES	0.036%
51	Pyridine	14	7837-G2	0.00030	1.0	0.030%	YES	0.036%
51	Pyridine	16	7837-H2	0.00030	1.0	0.030%	YES	0.036%
51	Pyridine	2	8068-A1	0.00177	1.0	0.177%		0.036%
51	Pyridine	4	8068-B1	0.00236	1.0	0.236%		0.036%
51	Pyridine	6	8068-C1	0.00240	1.0	0.240%		0.036%
51	Pyridine	8	8068-D1	0.00224	1.0	0.224%		0.036%
51	Pyridine	10	8068-E1	0.00159	1.0	0.159%		0.036%
51	Pyridine	12	8068-F1	0.00124	1.0	0.124%		0.036%
51	Pyridine	14	8068-G1	0.00165	1.0	0.165%		0.036%
51	Pyridine	16	8068-H1	0.00032	1.0	0.032%	YES	0.036%
51	Pyridine	2	8068-A2	0.00030	1.0	0.030%	YES	0.036%
51	Pyridine	4	8068-B2	0.00035	1.0	0.035%	YES	0.036%
51	Pyridine	6	8068-C2	0.00034	1.0	0.034%	YES	0.036%
51	Pyridine	8	8068-D2	0.00036	1.0	0.036%	YES	0.036%
51	Pyridine	10	8068-E2	0.00033	1.0	0.033%	YES	0.036%
51	Pyridine	12	8068-F2	0.00030	1.0	0.030%	YES	0.036%
51	Pyridine	14	8068-G2	0.00031	1.0	0.031%	YES	0.036%
51	Pyridine	16	8068-H2	0.00085	1.0	0.085%		0.036%
52	2,4-Dimethylpyridine	2	7837-A1	0.00019	0.5	0.039%	YES	0.046%
52	2,4-Dimethylpyridine	4	7837-B1	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	6	7837-C1	0.00022	0.5	0.043%	YES	0.046%
52	2,4-Dimethylpyridine	8	7837-D1	0.00020	0.5	0.041%	YES	0.046%
52	2,4-Dimethylpyridine	10	7837-E1	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	12	7837-F1	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	14	7837-G1	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	16	7837-H1	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	2	7837-A2	0.00021	0.5	0.041%	YES	0.046%
52	2,4-Dimethylpyridine	4	7837-B2	0.00021	0.5	0.042%	YES	0.046%
52	2,4-Dimethylpyridine	6	7837-C2	0.00021	0.5	0.042%	YES	0.046%
52	2,4-Dimethylpyridine	8	7837-D2	0.00021	0.5	0.041%	YES	0.046%
52	2,4-Dimethylpyridine	10	7837-E2	0.00020	0.5	0.040%	YES	0.046%
52	2,4-Dimethylpyridine	12	7837-F2	0.00020	0.5	0.040%	YES	0.046%
52	2,4-Dimethylpyridine	14	7837-G2	0.00019	0.5	0.039%	YES	0.046%
52	2,4-Dimethylpyridine	16	7837-H2	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	2	8068-A1	0.00020	0.5	0.039%	YES	0.046%
52	2,4-Dimethylpyridine	4	8068-B1	0.00020	0.5	0.040%	YES	0.046%
52	2,4-Dimethylpyridine	6	8068-C1	0.00020	0.5	0.039%	YES	0.046%
52	2,4-Dimethylpyridine	8	8068-D1	0.00021	0.5	0.042%	YES	0.046%
52	2,4-Dimethylpyridine	10	8068-E1	0.00022	0.5	0.043%	YES	0.046%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
52	2,4-Dimethylpyridine	12	8068-F1	0.00020	0.5	0.040%	YES	0.046%
52	2,4-Dimethylpyridine	14	8068-G1	0.00020	0.5	0.040%	YES	0.046%
52	2,4-Dimethylpyridine	16	8068-H1	0.00020	0.5	0.041%	YES	0.046%
52	2,4-Dimethylpyridine	2	8068-A2	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	4	8068-B2	0.00023	0.5	0.045%	YES	0.046%
52	2,4-Dimethylpyridine	6	8068-C2	0.00022	0.5	0.043%	YES	0.046%
52	2,4-Dimethylpyridine	8	8068-D2	0.00023	0.5	0.046%	YES	0.046%
52	2,4-Dimethylpyridine	10	8068-E2	0.00021	0.5	0.042%	YES	0.046%
52	2,4-Dimethylpyridine	12	8068-F2	0.00019	0.5	0.038%	YES	0.046%
52	2,4-Dimethylpyridine	14	8068-G2	0.00020	0.5	0.039%	YES	0.046%
52	2,4-Dimethylpyridine	16	8068-H2	0.00016	0.5	0.032%	YES	0.046%

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

1,3-Butadiene (see Figure E.1) – The detection limit (DL) for 1,3-butadiene corresponds to ~2.1% of its Occupational Exposure Limit (OEL). Measured inlet and outlet concentrations for both cartridges were below the DL. Based on the information collected there is no evidence of breakthrough over the measured time period for either cartridge tested.

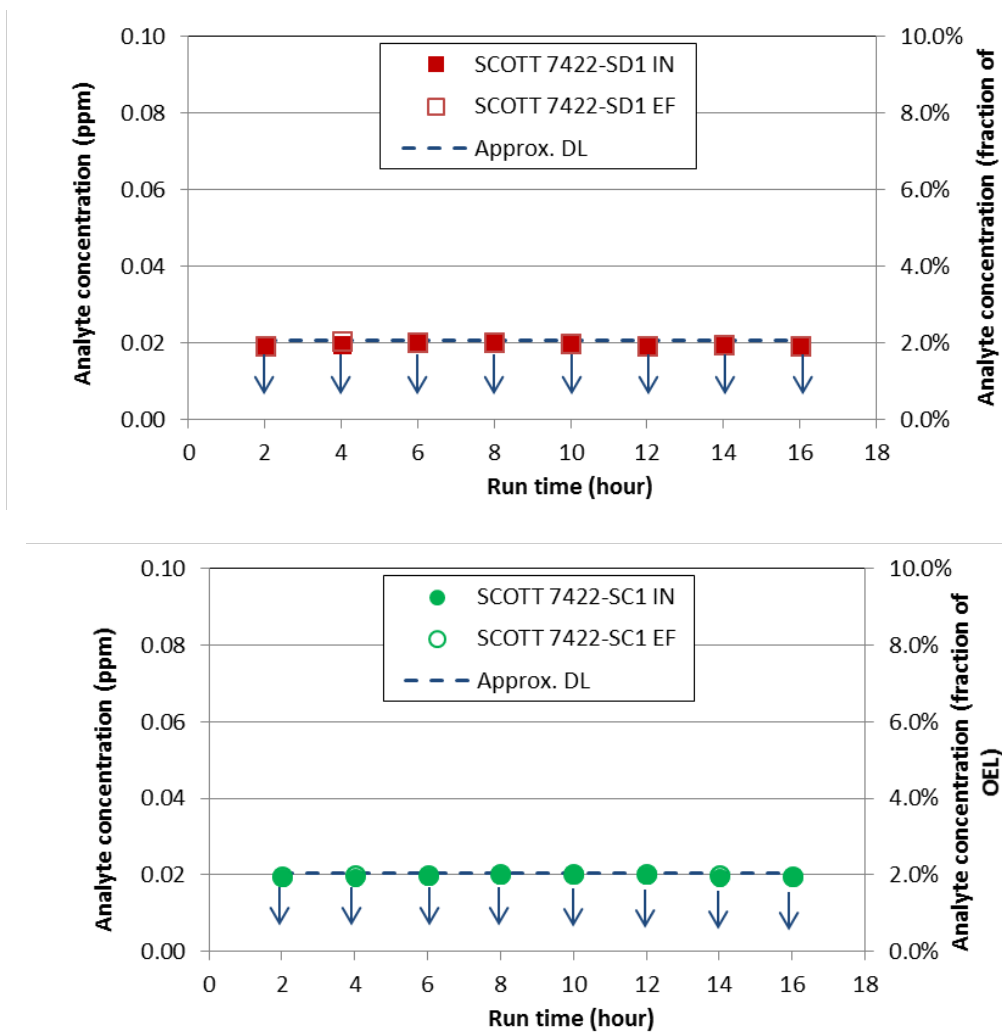


Figure E.1. Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL).

2,5-Dihydrofuran (see Figure E.2) – The DL for 2,5-dihydrofuran corresponds to ~3.1% of its OEL.²⁰ Measured inlet concentrations for both cartridges were below the DL.²¹ Two measured outlet concentrations using the Tenax method for the SCOTT 7422-SC1 cartridge were slightly higher than the DL (~4% of the OEL), however, these measurements were inconsistent with the lower concentrations at the corresponding inlets. Based on the information collected there is no evidence of breakthrough over the measured time period for either cartridge tested.²²

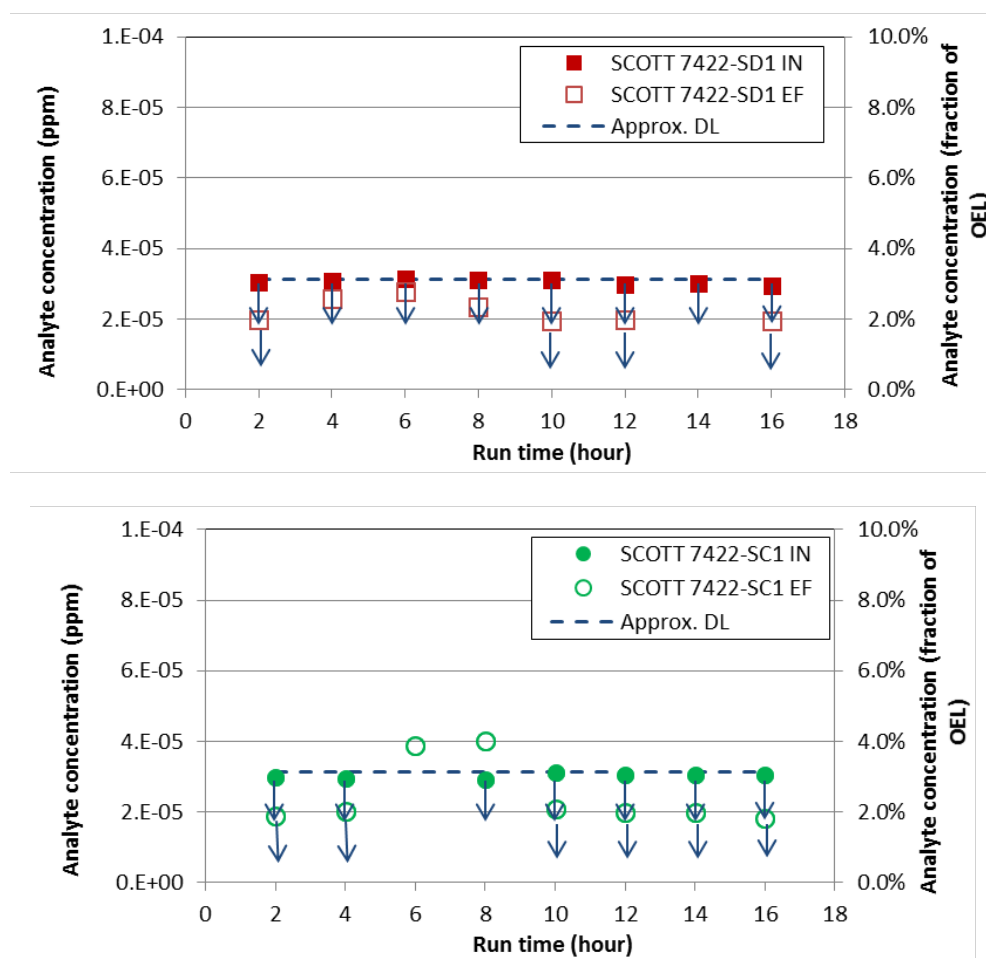


Figure E.2. Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

²⁰ A higher flowrate and corresponding volume of sample was passed through the effluent furan sorbent sample tubes for the AX-101 test to help improve the DL for measurements downstream of the cartridge. The approximate DL reported here and shown on the figures represents the influent sample DL, which is higher than the DL for effluent samples by ~1 to 2% of the OEL.

²¹ Outlet concentration results for all furans for the 14-hour period (SCOTT 7422-SD1) and inlet results for the 6-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

²² Inlet and effluent concentration measurements for 2,5-dihydrofuran using the Carbotrap 300 TDU Method were all below detection limits. Breakthrough was not observed on either cartridge.

2-Methyfurane (see Figure E.3) – The DL for 2-methylfuran corresponds to ~3.7% of its OEL. Tenax method measured inlet and outlet concentrations of 2-methylfuran for both cartridges tested were below the DL, thus there is no evidence of breakthrough over the measured time period for either cartridge tested²³.

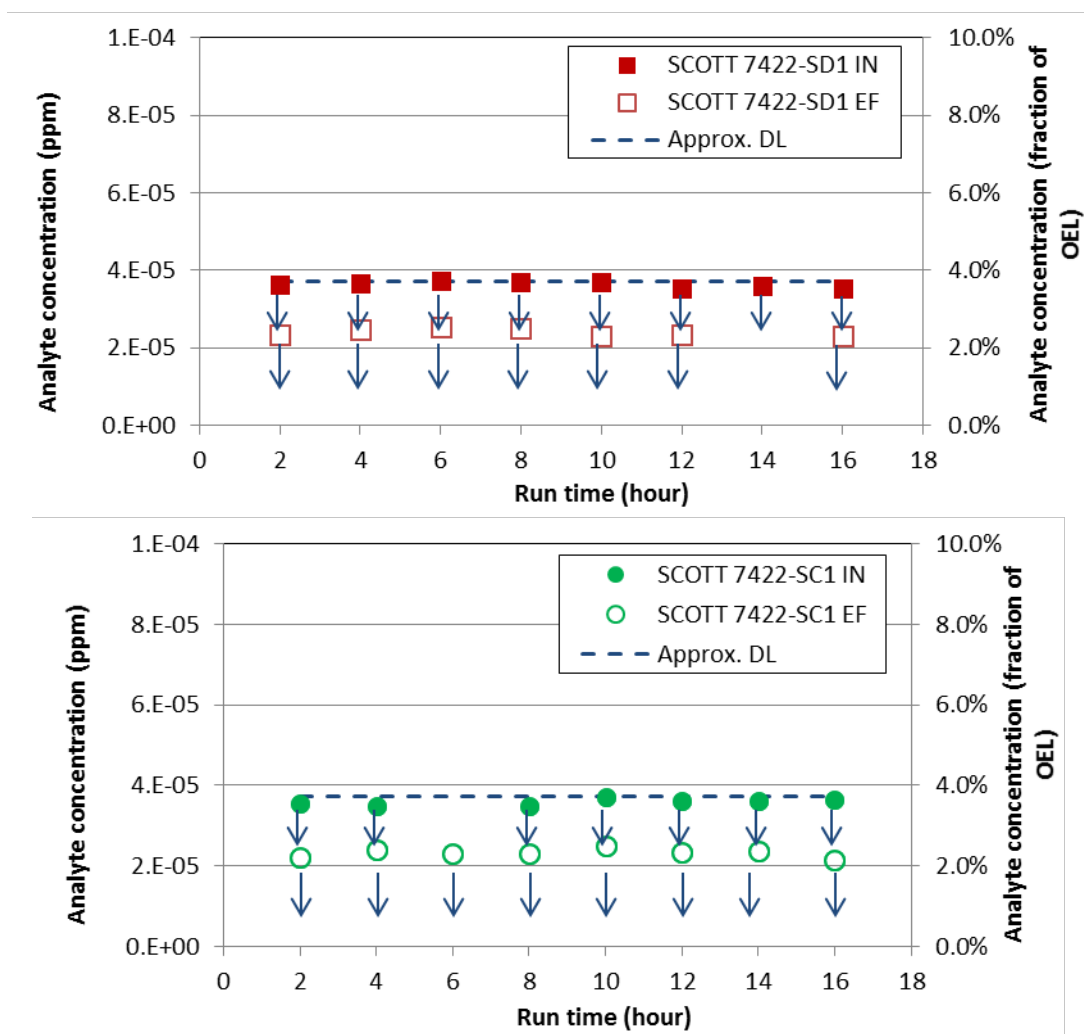


Figure E.3. Plot of Measured 2-Methylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

²³ Inlet and effluent concentration measurements for 2-methylfuran using the Carbotrap 300 TDU Method were all below the DL. Breakthrough was not observed on either cartridge.

2,5-Dimethylfuran (see Figure E.4) – The DL for 2,5-dimethylfuran corresponds to ~5.2% of its OEL. Measured inlet and outlet concentrations of 2,5-dimethylfuran for both cartridges tested were below the DL, thus there is no evidence of breakthrough over the measured time period for either cartridge tested.

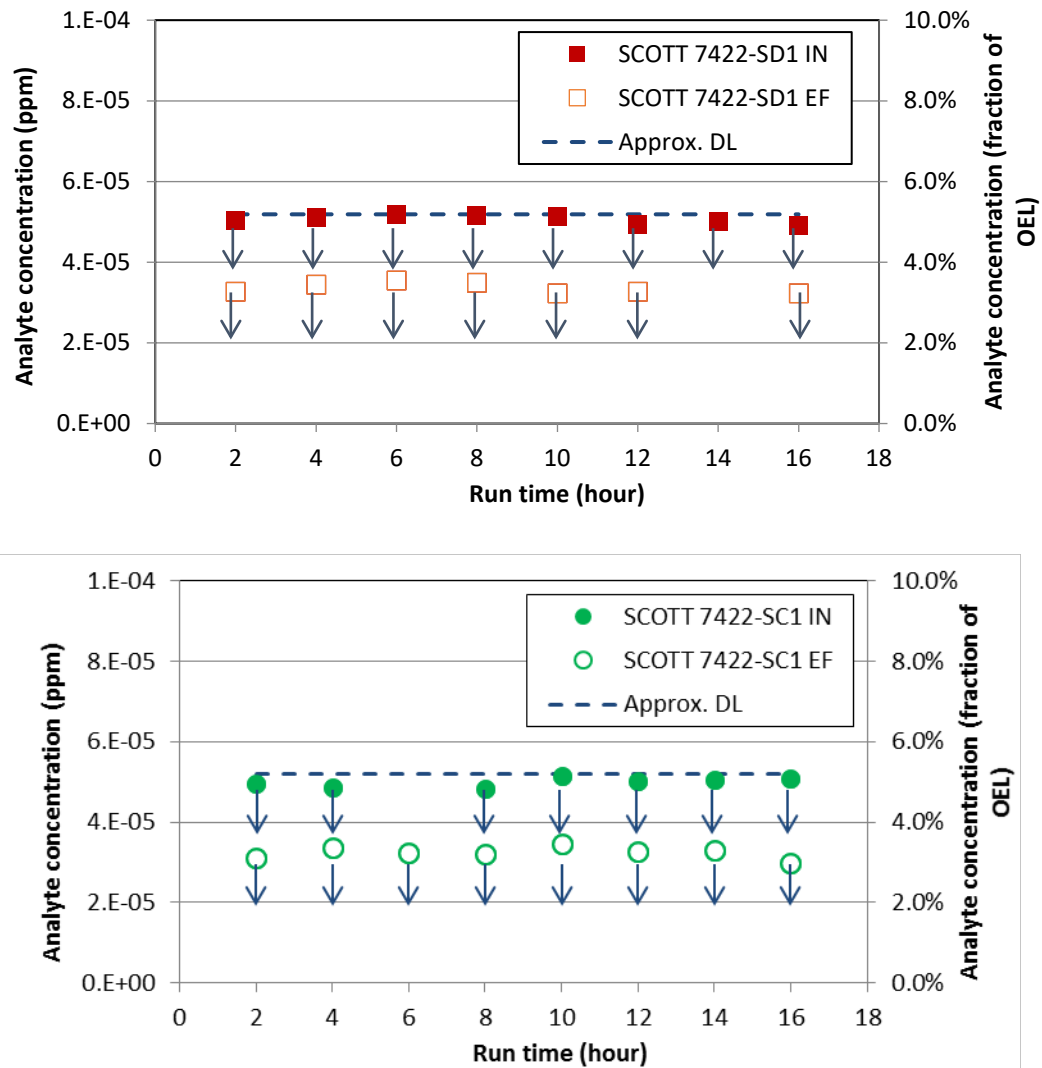


Figure E.4. Plot of Measured 2,5-Dimethylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Pentylfuran (see Figure E.5) – The DL for 2-pentylfuran corresponds to ~4.3% of its OEL. Measured inlet concentrations for the SCOTT 7422-SD1 respirator test were below the analytical DL. In contrast, the first two measured inlet concentrations for the SCOTT 7422-SC1 were higher than the DL but decreased to the DL by the end of testing. Most of the measured outlet concentrations for both cartridges were less than the analytical DL with a few exceptions. The highest measured outlet concentration was 4.5% of the OEL for the SCOTT 7422-SC1 cartridge test for the 6-hour time period. Nevertheless, all subsequent outlet concentrations for that cartridge were at the DL. Based on these data collected, there is no evidence of breakthrough over the measured time period for either cartridge tested.

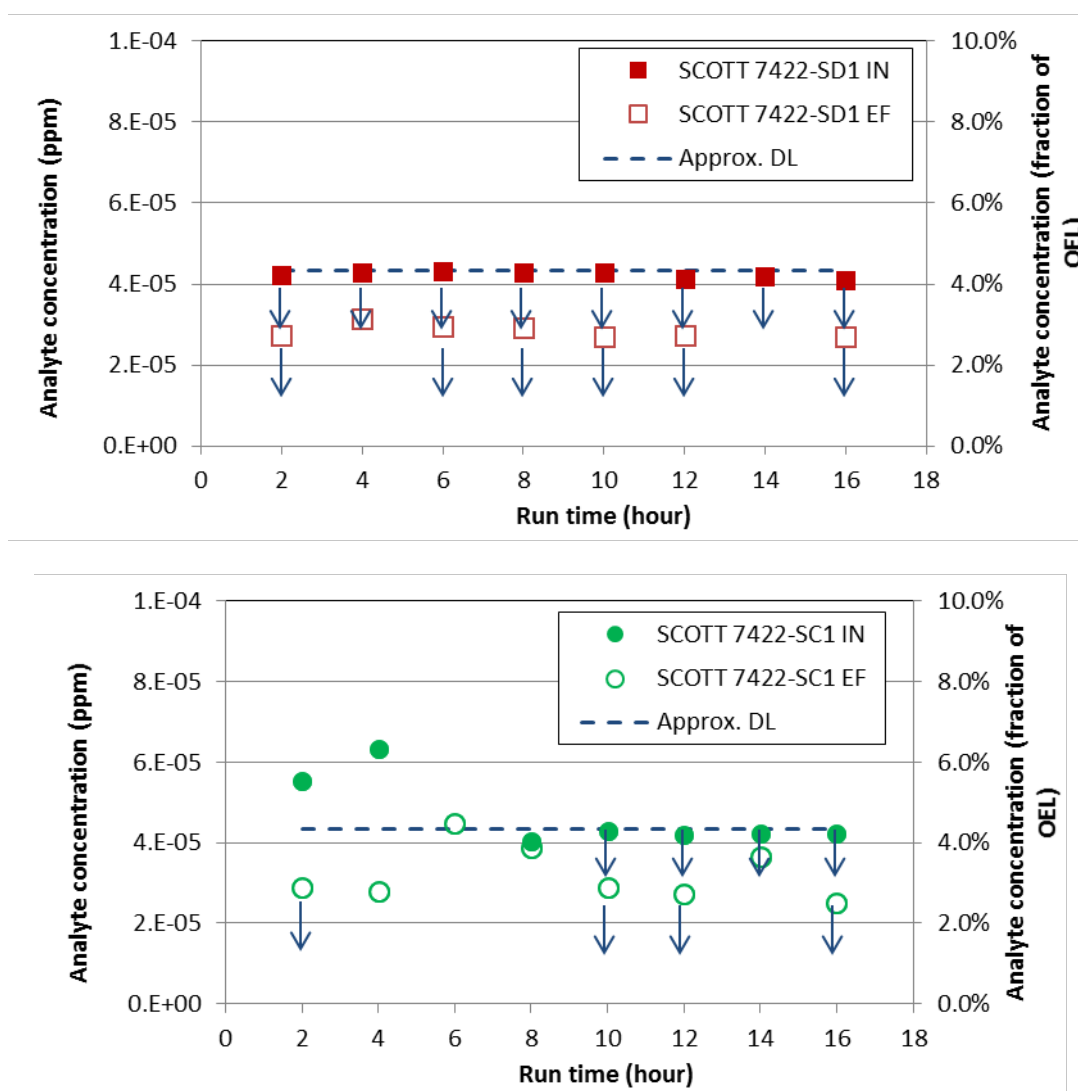


Figure E.5. Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Heptylfuran (see Figure E.6) – The DL for 2-heptylfuran corresponds to ~3.4% of its OEL. Measured inlet and outlet concentrations for SCOTT 7422-SD1 were below the analytical DL. Measured inlet concentrations for SCOTT 7422-SC1 were below the analytical DL. Several outlet concentrations from the 7422-SC1 cartridge were greater than, but very near the DL (2.2 to 2.7% of the OEL). Thus, there is no evidence of breakthrough over the measured time period for either cartridge tested.

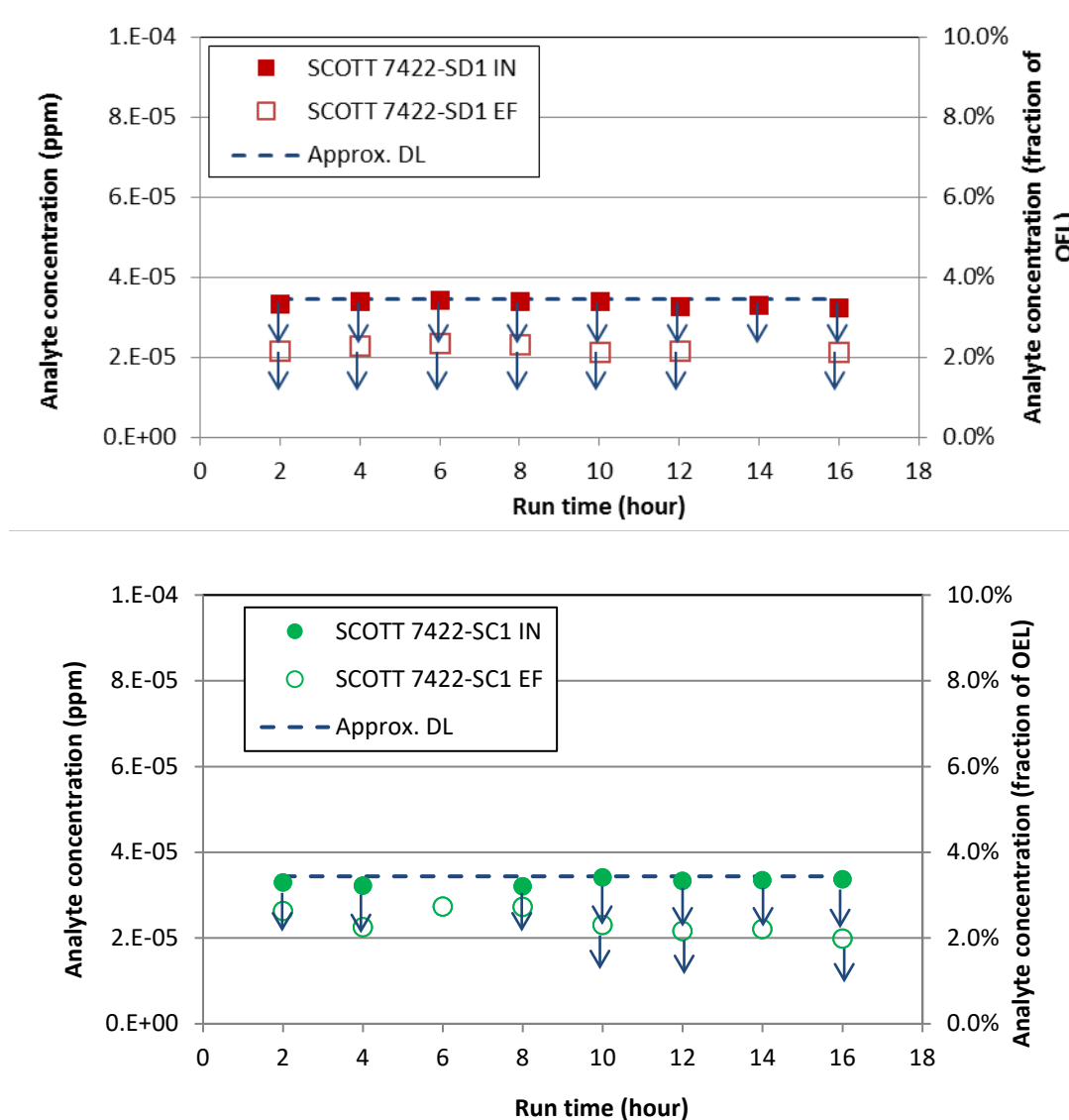


Figure E.6. Plot of Measured 2-Heptylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Propylfuran (see Figure E.7) – The DL for 2-propylfuran corresponds to ~3.7% of its OEL. Measured inlet and outlet concentrations for both the cartridges tested were below the DL, indicating no evidence of breakthrough over the measured time period for either cartridge tested.

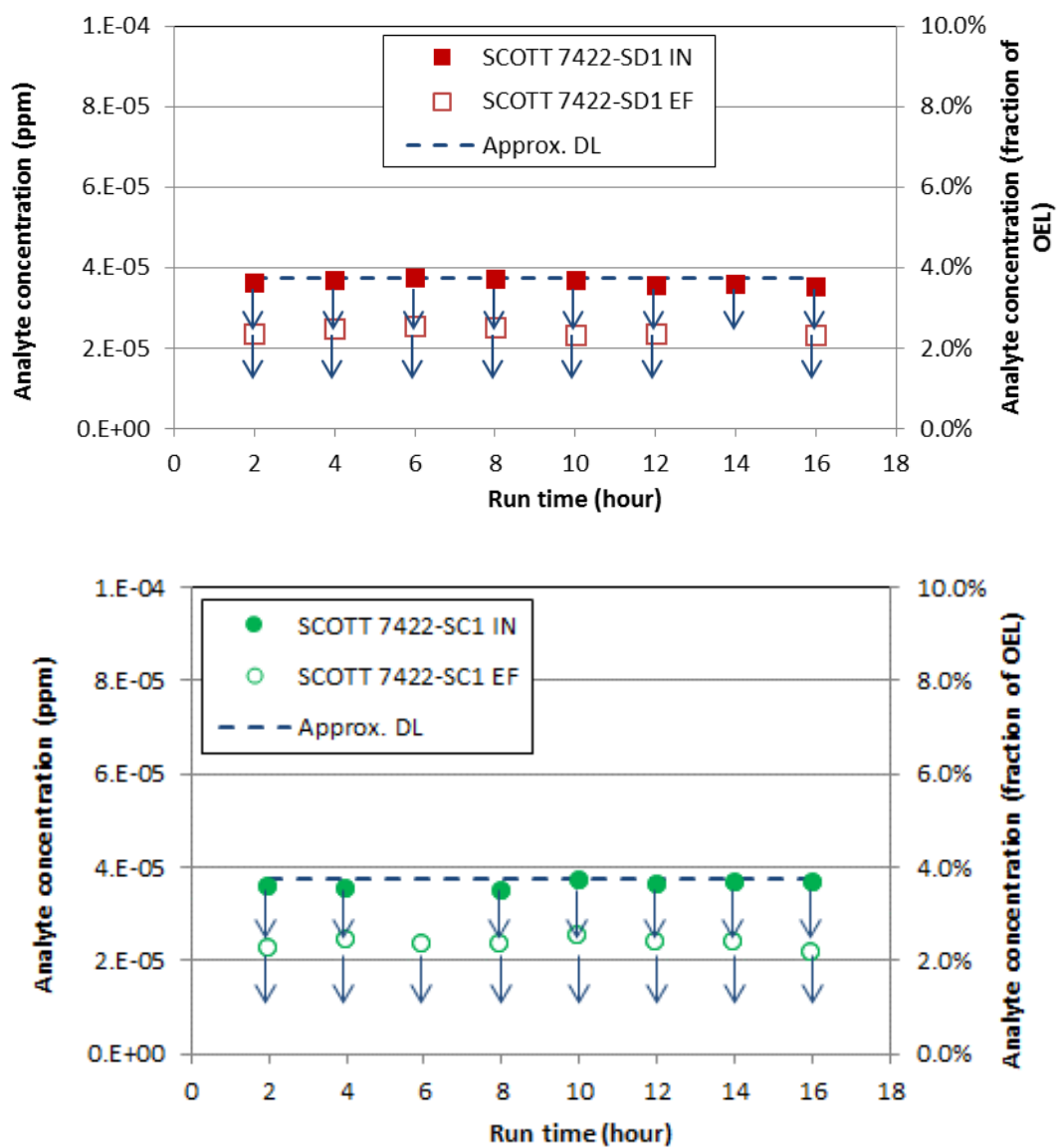


Figure E.7. Plot of Measured 2-Propylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Appendix F

Historical Data Comparison

Appendix F

Historical Data Comparison

F.1 Data Sources

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 tank 241-AX-101 were obtained via a TWINS query on June 20, 2016, for TWINS HS,²⁴ and another query on October 7, 2016, for TWINS IH. More recent headspace data were also obtained from the Site-Wide Industrial Hygiene Database (SWIHD) by two queries. The first, on July 12, 2016, contained all data loaded as of that date. The second query contained all data with survey dates between May 1, 2016, and October 7, 2016. This latter data set was used to update and supplement the former, 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 identifier was 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

²⁴ No data have been added to TWINS HS since April 2005, so the June 2016 download does not require updating.

chemical identifier, and the concentration was 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.

Several chemicals in the TWINS IH data set had “needs conversion” notes in the concentration (mg/m³ 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 atmosphere were assumed.

The method described above was consistent with that used in PNNL-25880,²⁵ 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 the AX-101 headspace, only headspace measurements were appropriate. This required no scrutiny for the TWINS HS or SWIHD HS databases because they were headspace only for AX Farm tanks, but the TWINS IH database required sorting so that only headspace data were used. The AX Farm data in the TWINS IH database were all attributed to individual tank locations; that is, there were no Location designations such as “Inside Farm,” “Outside Farm,” etc. Of the data that had AX-101 as a Location, all had Survey Titles that included phrases such as “AX-101 BF COPC Sampling,” “AX-101 COPC Sampling,” or “AX-101 BF COPC Make-up.” Because the Location was specified as AX-101, and many of the surveys contained “BF” (Breather Filter) in the title, all TWINS IH AX-101 data were considered to be from tank headspace.

Maximum and average (i.e., arithmetic average) headspace concentrations were found for each analyte for the combined TWINS IH and SWIHD HS databases.⁽²⁶⁾ These maxima and averages are given in Table F.1,⁽²⁷⁾ 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. In these cases, 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 italic font. The criterion for tabulating this extra information was that there was 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.

²⁵ Hoppe, EW, LA Mahoney, J Cole, and KS Rohlfling. 2016. *Hanford Tank Vapors COPCs Update*. PNNL-25880, Pacific Northwest National Laboratory, Richland, Washington.

²⁶ This evaluation used the concentration data in SWIHD HS and converted them to %OEL, rather than directly using the %OEL data in SWIHD HS. Although this approach was consistent with the methods used on the other two data sets, there are cases where it gave a %OEL value smaller than that found in the SWIHD database. This difference occurs because concentrations in SWIHD HS may be truncated to one or two significant figures, while the %OEL values in SWIHD HS are calculated from concentrations before truncation. The difference between %OEL based on truncated and non-truncated concentrations is small enough to have no effect on conclusions about whether cartridge maxima are consistent with historical maxima.

²⁷ All %OEL values were calculated from concentration data that had been rounded to a minimum of three significant figures.

Because the RLs on concentrations in the historical database were generally higher than the RLs or detection limits (DL) in the cartridge tests, it was necessary to analyze data in a way that would let the effect of less than RL historical data be recognized. To do this, it was assumed that 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. Chemicals of Potential Concern (COPC) Comparison to Historical AX-101 Measurements

COPC Number and Name		CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements ¹					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 ¹³ (%OEL)	
Inorganic															
1	Ammonia	7664-41-7	-28	Poling et al., 2007 ²	25 ppm	3	93.9	31.6*	376%	126%*	801%	713%	767%	2.56% (RL)	
2	Nitrous Oxide	10024-97-2	-127	Poling et al., 2007	50 ppm	1	<RL	<RL	<RL	<RL	Not Measured				
3	Mercury	7439-97-6	674	Poling et al., 2007	0.025 mg/m ³	3	0.006	0.00311	24%	12%	24.3%	18.7%	16.3%	7.33% (RL)	
Hydrocarbons															
4	1,3-Butadiene	106-99-0	24	Poling et al., 2007	1 ppm	5	<RL	<RL	<RL	<RL	<RL	<RL	<RL	2.05% (RL)	
5	Benzene	71-43-2	176	Poling et al., 2007	0.5 ppm	3	<RL	<RL	<RL	<RL	0.19%	0.15%	0.090%	0.021%	
6	Biphenyl	92-52-4	491	Poling et al., 2007	0.2 ppm	2	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.096%	
Alcohols															
7	1-Butanol	71-36-3	243	NIOSH	20 ppm	2	0.035	0.0205	0.18%	0.10%	0.32%	0.22%	0.15%	0.004%	
8	Methanol	67-56-1	148	Poling et al., 2007	200 ppm	0	n/a	n/a	n/a	n/a	Not Measured				
Ketones															
9	2-Hexanone	591-78-6	262	NIOSH	5 ppm	3	<RL	0.00373*	<RL	0.07%*	0.062%	0.041%	0.028%	0.002%	
10	3-Methyl-3-buten-2-one	814-78-8	208	CRC Handbook 1989 ⁴	0.02 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC ¹²				
11	4-Methyl-2-hexanone	105-42-0	282	Predicted ACD/Labs ⁵	0.5 ppm	1	<RL	<RL	<RL	<RL	0.021%	0.015%	<DL	0.017%	
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	1	0.005	0.005	2.5%	2.5%	1.70%	1.00%	0.48%	0.083%	
Aldehydes															
14	Formaldehyde	50-00-0	-6	NIOSH	0.3 ppm	5	<RL	0.0353*	<RL	12%*	14.4%	4.91%	0.67%	0.63% (RL)	
15	Acetaldehyde	75-07-0	69	NIOSH	25 ppm	2	<RL	<RL	<RL	<RL	0.42%	0.35%	0.32%	0.005% (RL)	
16	Butanal	123-72-8	167	Oxford safety data ⁶	25 ppm	4	<RL	0.0555*	<RL	0.22%*	0.017%	0.010%	0.005%	0.001%	
17	2-Methyl-2-butenal	1115-11-3	244	United Nations ⁷	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 ¹					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 ¹³ (%OEL)
Furans														
19	Furan	110-00-9	88	Poling et al., 2007	1 ppb	5	<RL	<RL	<RL	<RL	14.7%	4.96%	6.20%	3.61%
20	2,3-Dihydrofuran	1191-99-7	130	Alfa Aesar ⁸	1 ppb	2	<RL	<RL	<RL	<RL	43.6%	16.4%	10.4%	2.14%
21	2,5-Dihydrofuran	1708-29-8	152	Aldrich ⁹	1 ppb	5	<RL	<RL	<RL	<RL	<DL	<DL	4.00%	3.13%
22	2-Methylfuran	534-22-5	147	Oxford safety data	1 ppb	4	<RL	<RL	<RL	<RL	<DL	<DL	<DL	3.72%
23	2,5-Dimethylfuran	625-86-5	199	Alfa Aesar	1 ppb	2	<RL	<RL	<RL	<RL	<DL	<DL	<DL	5.19%
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			
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			
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			
27	2-Pentylfuran	3777-69-3	333	Alfa Aesar	1 ppb	2	<RL 2.74	<RL 1.6	<RL 274%	<RL 160%	6.32%	4.44%	4.49%	4.33%
28	2-Heptylfuran	3777-71-7	410	Alfa Aesar	1 ppb	2	<RL	<RL	<RL	<RL	<DL	<DL	2.73%	3.44%
29	2-Propylfuran	4229-91-8	231	Alfa Aesar	1 ppb	2	<RL	<RL	<RL	<RL	<DL	<DL	<DL	3.74%
30	2-Octylfuran	4179-38-8	452	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	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			
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			
Phthalates														
33	Diethylphthalate	84-66-2	563	NIOSH	5 mg/m ³	2	<RL	<RL	<RL	<RL	<DL	<DL	<DL	0.042%

Table F.1. (continued)

COPC Number and Name		CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements ¹					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 ^{1,2} (%OEL)
Nitriles														
34	Acetonitrile	75-05-8	179	NIOSH	20 ppm	3	<RL	0.261*	<RL	1.3%*	2.55%	0.70%	20.8%	0.002%
35	Propanenitrile	107-12-0	207	NIOSH	6 ppm	3	0.004	0.00269	0.07%	0.04%	0.16%	0.12%	0.077%	0.003%
36	Butanenitrile	109-74-0	244	NIOSH	8 ppm	1	0.004	0.004	0.05%	0.05%	0.064%	0.046%	0.025%	0.002%
37	Pentanenitrile	110-59-8	284	Alfa Aesar	6 ppm	3	<RL	<RL	<RL	<RL	0.023%	0.016%	0.007%	0.002%
38	Hexanenitrile	628-73-9	328	Predicted ACD/Labs	6 ppm	3	<RL	<RL	<RL	<RL	0.17%	0.039%	0.002%	0.002%
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			
Amines														
42	Ethylamine	75-04-7	62	Poling et al., 2007	5 ppm	2	<RL	<RL	<RL	<RL	<RL	<RL	<RL	0.098% (RL)
Nitrosamines														
43	N-Nitrosodimethylamine	62-75-9	306	NIOSH	0.3 ppb	3	1.6	0.567*	533%	189%*	932%	642%	644%	11.2% (RL)
44	N-Nitrosodiethylamine	55-18-5	351	Oxford safety data	0.1 ppb	3	<RL	<RL	<RL	<RL	<RL	<RL	<RL	23.2% (RL)
45	N-Nitrosomethylethylamine	10595-95-6	310	Predicted ACD/Labs	0.3 ppb	3	<RL	<RL	<RL	<RL	15.5%	11.1%	8.95%	8.95% (RL)
46	N-Nitrosomorpholine	59-89-2	435	Oxford safety data	0.6 ppb	3	<RL	<RL	<RL	<RL	14.4%	7.45%	7.85%	3.40% (RL)
Organophosphates														
47	Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	2	<RL	<RL	<RL	<RL	<RL	<RL	<RL	0.078%
48	Dibutyl butylphosphonate	78-46-6	602	Predicted ACD/Labs	0.007 ppm	2	<RL	<RL	<RL	<RL	<RL	<RL	<RL	1.51%
Halogenated														
49	Chlorinated Biphenyls	Varies	Varies	Varies	1 mg/m ³	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
50	2-Fluoropropene	1184-60-7	-11	SynQuest ¹¹	0.1 ppm	1	<RL	<RL	<RL	<RL	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 ¹				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 ¹³ (%OEL)
Pyridines														
51	Pyridine	110-86-1	240	NIOSH	1 ppm	5	<RL	<RL	<RL	<RL	0.24%	0.16%	0.085%	0.036% (RL)
52	2,4-Dimethylpyridine	108-47-4	318	Alfa Aesar	0.5 ppm	4	<RL	<RL	<RL	<RL	<RL	<RL	<RL	0.046% (RL)
Organonitriles														
53	Methyl nitrite	624-91-9	10	Oxford safety data	0.1 ppm	0	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		Not Detected - TIC		
Organonitrates														
55	Butyl nitrate	928-45-0	276	Predicted ACD/Labs	2.5 ppm	0	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		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		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		Not Detected - TIC		
Isocyanates														
59	Methyl isocyanate	624-83-9	103	NIOSH	0.02 ppm	0	n/a	n/a	n/a	n/a		Not Detected - TIC		
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.														

¹ 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

² Poling, B. E.; Prausnitz, J. M.; O'Connell, J. P. *The Properties of Gases and Liquids*. McGraw Hill, 2007.

³ NIOSH: National Institute of Occupational Safety and Health

⁴ CRC Handbook of Chemistry and Physics, CRC Press, 1989.

⁵ ACD/Labs software <http://www.acdlabs.com/products/percepta/predictors.php>

⁶ Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

⁷ Food and Agriculture Organization of the United Nations

⁸ Alfa Aesar: <https://www.alfa.com/>

⁹ Aldrich: <https://www.sigmaaldrich.com/>

¹⁰ OSHA: Occupational Safety and Health Administration

¹¹ SynQuest: <http://synquestlabs.com/product/id/8330.html>

¹² TIC: Tentatively Identified Compounds that were not observed in this study using the specified analytical methods.

¹³ Approximate Detection Limit (DL) 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.

F.2 AX-101 Headspace: Comparison with Historical Data

The maximum and average COPC concentrations measured during cartridge testing were compared to the maximum and average historical concentrations, and where differences were found, the historical data were examined for explanations in the type or circumstances of sampling.

Much of the waste in tank AX-101 was transferred out over the March 2001–April 2003 period. Hence, all data predating April 2003 are considered inappropriate for comparison to the July 2016 cartridge test data. This includes all data from the TWINS HS database from which the latest AX-101 data were taken in September 2002. Earlier data do not appear in Table F.1.

The headspaces of all four tanks in the AX Farm are connected by overflow cascade lines and a ventilation header (Huckaby et al. 2004). Therefore, waste disturbances in any AX Farm tank could propagate changes in vapor concentration to the AX-101 headspace. However, there have been no such waste disturbances in the post-2003 period. All post-2003 AX-101 vapor data were taken under passive-ventilation non-disturbance conditions, as were the July 2016 cartridge-test data.

The larger discrepancies, or apparent discrepancies, between cartridge inlet and historical concentrations are discussed in the following sections.

F.2.1 Nitrous Oxide

Nitrous oxide was not measured during cartridge testing. The only historical measurement found in TWINS IH was a below-report with an RL of 1.6 ppm (<3.2% of the OEL), which was measured on August 4, 2005, at a breather filter.

F.2.2 Furan

The maximum cartridge inlet concentration of 23.7% of the OEL is much lower than the historical maximum, a 2005 below-report with an RL of 3.87 ppb (<387% of the OEL) that was found in the TWINS IH database. The sample volume was 1.2 L. This volume cannot be determined to have been unusually low for TWINS IH because there were only two furan measurements in the database, both 1.2 L. There were no above-report concentrations in any of the databases. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentrations lie with respect to historical data.

F.2.3 2,5-Dihydrofuran, 2-Methylfuran

For both these chemicals, the cartridge inlet concentration is less than a DL of ~3 to 5% of the OEL, much less than the RLs of the below-report historical maxima. The maximum RL for 2,5-dihydrofuran (141% of the OEL) came from SWIHD HS and was at least 4× the next highest RL. The maximum RL for 2-methylfuran came from TWINS IH (224% of RL) and was approximately 2× the next highest RL. The RLs for 2,5-dihydrofuran and 2-methylfuran are high relative to their OELs but come from the same sample as for the furan maximum and cannot be determined to have been an unusually low volume. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentrations lie with respect to historical data.

F.2.4 2,5-Dimethylfuran, 2-Heptylfuran, 2-Propylfuran

For all these chemicals, the cartridge inlet concentration is less than a DL of ~3 to 5% of the OEL, much less than the below-report historical maxima that had RLs of 16 to 26% of the OEL. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentrations lie with respect to historical data.

F.2.5 2-Pentylfuran

The maximum cartridge inlet concentration of 6.3% of the OEL is >20% of the below-report historical maximum²⁸, an RL of 0.186 ppb (<19% of the OEL) measured on November 26, 2014, and found in SWIHD HS. Although the maximum cartridge inlet concentration is much less than that given by the TWINS HS database (274% of the OEL), the latter measurement was made in 1995, before retrieval, and is not applicable. The cartridge inlet concentration is consistent with the applicable historical data.

F.2.6 Dibutyl butylphosphonate (DBBP)

The maximum cartridge inlet concentration of <1.5% of the OEL, which is below its DL, is low compared to the historical maximum concentration, a below-report datum with RL of 0.00116 ppm (<17% of the OEL) from a TWINS IH sample taken on August 4, 2005, with a 1.2 L sample volume. There were no above-report historical data, so no conclusion can be drawn about where the cartridge inlet concentration lies with respect to historical data.

F.2.7 Summary of Historical Data for the AX-101 Headspace

In summary, cartridge inlet concentrations for the AX-101 Headspace that were substantially lower than historical data can be described as follows:

- Differences arose from using historical data taken during disturbance for the historical maximum: none
- Differences arose from using the RLs of below-report data for the historical maximum: none
- Differences arose from using data for vapor produced by a no-longer-existing inventory for the historical maximum: 2-pentylfuran
- Differences could not be resolved because of the scarcity of non-disturbance above-report data: furan, 2,5-dihydrofuran, 2-methylfuran, 2,5-dimethylfuran, 2-heptylfuran, 2-propylfuran, dibutyl butylphosphonate.
- Cartridge inlet concentrations were determined to be significantly lower than above-report historical concentrations: none.

²⁸ This section uses the thresholds from Appendix C in Freeman et.al. [19]. Discrepancies are discussed if the maximum historical concentration of a compound was greater than 10% of the OEL and the maximum cartridge inlet concentration was less than 50% of the historical value. However, discrepancies are considered significant only if the maximum historical concentration was greater than 10% of the OEL and the maximum cartridge inlet concentration is less than 20% of the historical value.



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