

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

July 2020

SK Nune CK Clayton J Liu CJ Freeman TM Brouns LA Mahoney



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

Pacific Northwest National Laboratory Richland, Washington 99352

Executive Summary

Washington River Protection Solutions 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 performance 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.

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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.

Multiple Hanford Tank Headspaces and Exhausters. PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington).

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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*

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 Headspaces 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.gove/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 Headspaces and Exhausters*. PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington

Revision History

Revision	Ecc. 1: D.1	D : (CO
Number	Effective Date	Description of Change
0		Initial issue
1	January 2020	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:
		 Addressing several external peer review comments including: Referencing the <i>Overview of 2016 through 2018 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters</i>, 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.
		2. 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 reevaluated 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.
		Inlet concentrations for furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 results were similar to those documented in this report. No breakthrough of these furan compounds was observed during either cartridge tested.

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 Headspaces 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-methylyfuran 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**

U.S. Environmental Protection Agency **EPA**

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 ΙH 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

Parts Per Million ppm

PNNL Pacific Northwest National Laboratory

RL Reporting Limit

SAR Supplied Air Respirator

Self-Contained Breathing Apparatus **SCBA 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.

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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 exhauster 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.

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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/HC/SD/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.3mscott.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

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.

4.1

dditional information on the specific use of RLs or DLs for each COPC

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

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-3-butene-2-one	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.< td=""></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-butenal	1115-11-3	Not Detected	0.03 ppm	TIC	х	
18 2-Ethyl-hex-2-enal	645-62-5	Not Detected	0.1 ppm	TIC	х	

 $^{^{\}rm l}$ Approximate DL is calculated using the reported DLs (or RLs) from the analytical laboratory and the average volume (from flowrate \times 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-methylyfuran 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
Furans ³	Ι					Up to 14.7% of OEL for inlet
19 Furan	110-00-9	0.15 ppb	1 ppb	3.61%		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%</dl.
22 2-Methylfuran	534-22-5	0.04 ppb	1 ppb	3.72%	х	
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	х	
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%.</dl.
29 2-Propylfuran	4229-91-8	0.04 ppb	1 ppb	3.74%	х	
30 2-Octylfuran	4179-38-8	Not Detected	1 ppb	TIC	х	
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	Not Detected	1 ppb	TIC	х	
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not Detected	1 ppb	TIC	х	
Phthalates						
33 Diethylphthalate	84-66-2	0.0021 mg/m3	5 mg/m3	0.042%	x	
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	х	
40 2-Methylene butanenitrile	1647-11-6	Not Detected	0.3 ppm	TIC	х	
41 2,4-Pentadienenitrile	1615-70-9	Not Detected	0.3 ppm	TIC	х	

 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%	х	All inlet and outlet values <dl (23.2% of OEL)</dl
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%.
Organophospates						
47 Tributyl phosphate	126-73-8	0.16 ppb	200 ppb	0.078%	х	
48 Dibutyl butylphosphonate	78-46-6	0.11 ppb	7 ppb	1.51%	х	
Halogenated						
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m3	TIC	х	
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	х	
54 Butyl nitrite	544-16-1	Not Detected	0.1 ppm	TIC	х	
Organonitrates						
55 Butyl nitrate	928-45-0	Not Detected	2.5 ppm	TIC	х	
56 1,4-Butanediol, dinitrate	3457-91-8	Not Detected	0.05 ppm	TIC	х	
57 2-Nitro-2-methylpropane	594-70-7	Not Detected	0.3 ppm	TIC	х	
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	Not Detected	0.05 ppm	TIC	х	
Isocyanates						
59 Methyl Isocyanate	624-83-9	Not Detected	20 ppb	TIC	х	

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.

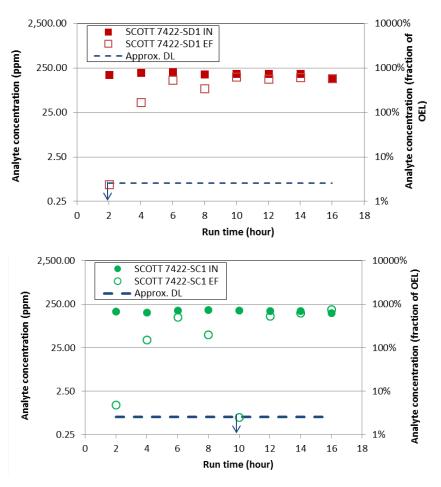


Figure 1. Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.

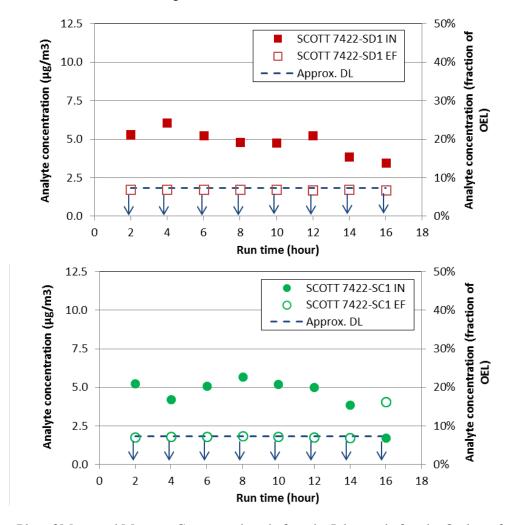


Figure 2. Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.

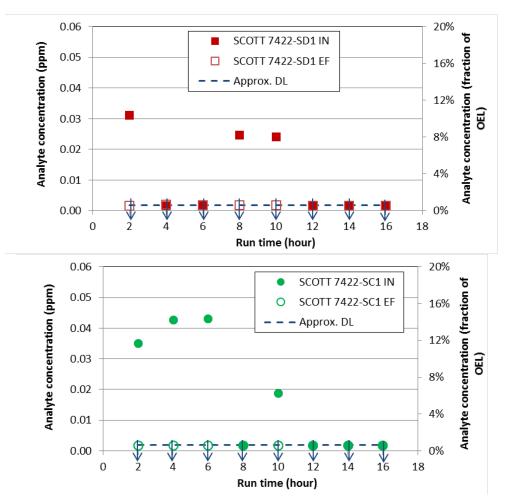


Figure 3. Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet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

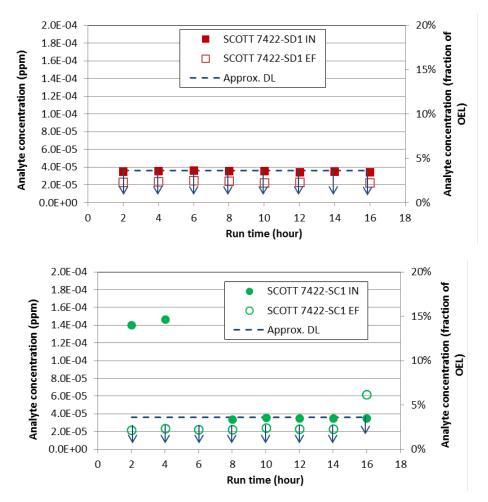


Figure 4. Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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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-dihdrofuran 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.

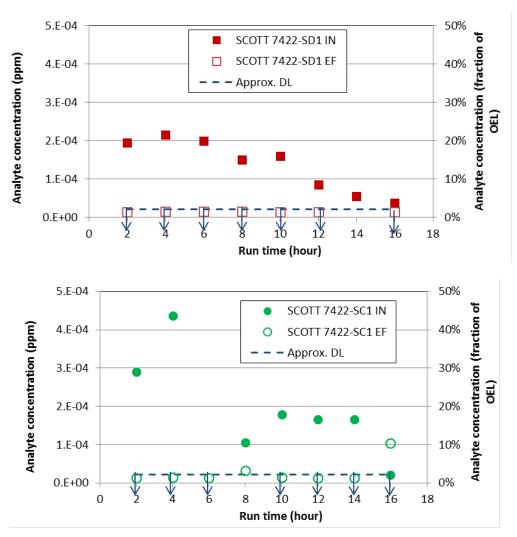


Figure 5. Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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, but <2.6% 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.

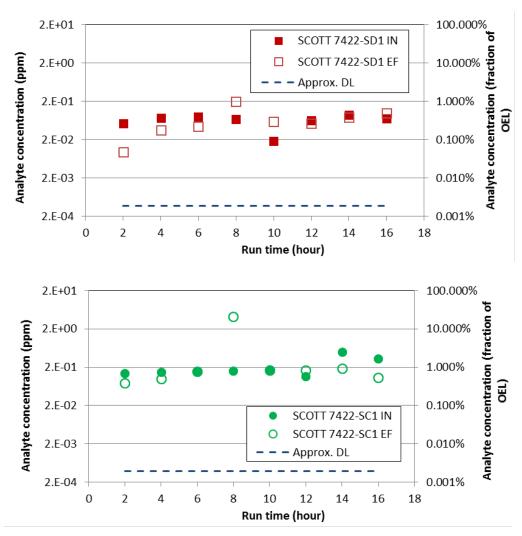


Figure 6. Plot of Measured Acetonitrile Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet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

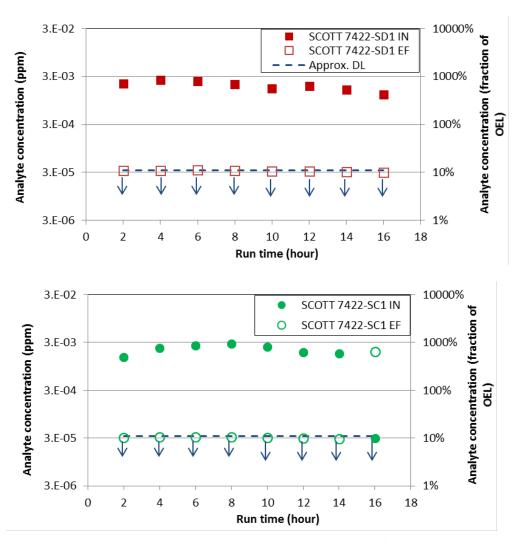


Figure 7. Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.

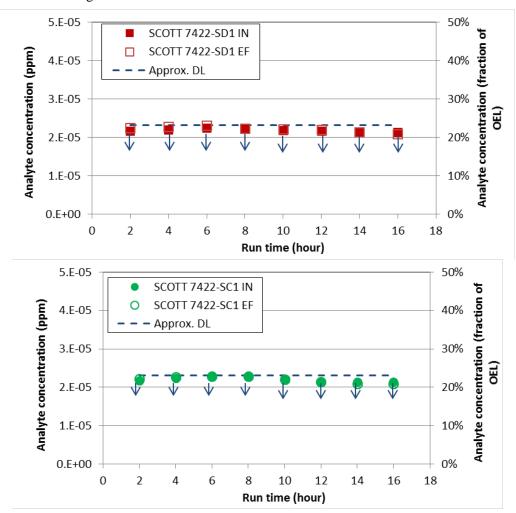
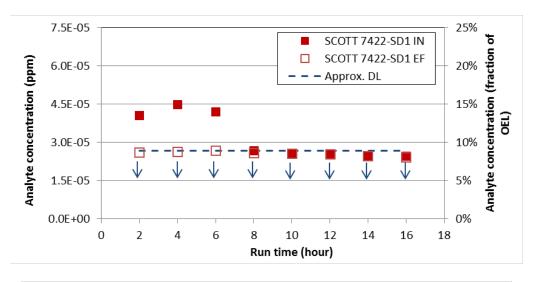


Figure 8. Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the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



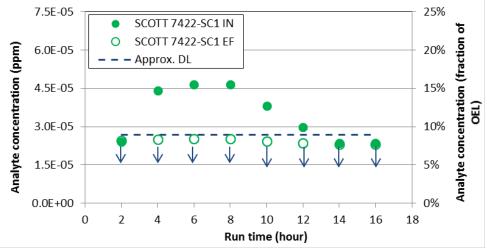


Figure 9. Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

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-SC1 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.

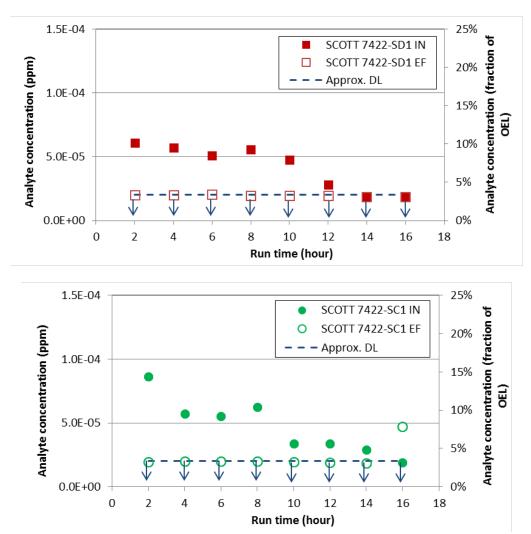


Figure 10. Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet points not visible are obscured by the inlet 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 consistent ¹⁴ 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.

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 $^{^{14}}$ 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-methylyfuran 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)

						Historic	al Measur	ements ¹		Measurements in this Study			
C	OPC Number and Name	CAS Boilin Number Poin (°F)		Occupational Exposure Limit (OEL)	# of Values	Max. Value	Average Value	Max. Value (% OEL)	Average Value (% OEL)	Max Inlet Value (% OEL)	Highest Value from Respirator Outlet (% OEL)		
2	2 Nitrous Oxide 100		-127	50 ppm	1	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>Not N</td><td>/leasured</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>Not N</td><td>/leasured</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>Not N</td><td>/leasured</td></rl<></td></rl<>	<rl< td=""><td>Not N</td><td>/leasured</td></rl<>	Not N	/leasured		
1	Ammonia 7664-41-7 -28		-28	25 ppm	3	93.9	31.6*	376%	126%*	801%	767%		
50	2-Fluoropropene	1184-60-7	-11	0.1 ppm	1	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>Not De</td><td>tected - TIC</td></rl<></td></rl<>	<rl< td=""><td>Not De</td><td>tected - TIC</td></rl<>	Not De	tected - TIC		
14	Formaldehyde	50-00-0	-6	0.3 ppm	5	<rl< td=""><td>0.0353*</td><td><rl< td=""><td>12%*</td><td>14.4%</td><td>0.67%</td></rl<></td></rl<>	0.0353*	<rl< td=""><td>12%*</td><td>14.4%</td><td>0.67%</td></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 De	tected - TIC		
4	1,3-Butadiene	106-99-0	24	1 ppm	5	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>2.0% (RL)²</td><td>2.1% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>2.0% (RL)²</td><td>2.1% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>2.0% (RL)²</td><td>2.1% (RL)</td></rl<></td></rl<>	<rl< td=""><td>2.0% (RL)²</td><td>2.1% (RL)</td></rl<>	2.0% (RL) ²	2.1% (RL)		
42	Ethylamine	75-04-7	62	5 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.097% (RL)</td><td>0.098% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.097% (RL)</td><td>0.098% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.097% (RL)</td><td>0.098% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.097% (RL)</td><td>0.098% (RL)</td></rl<>	0.097% (RL)	0.098% (RL)		
15	Acetaldehyde	75-07-0	69	25 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.42%</td><td>0.32%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.42%</td><td>0.32%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.42%</td><td>0.32%</td></rl<></td></rl<>	<rl< td=""><td>0.42%</td><td>0.32%</td></rl<>	0.42%	0.32%		
19	Furan	110-00-9	88	1 ppb	5	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>14.7%</td><td>6.2%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>14.7%</td><td>6.2%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>14.7%</td><td>6.2%</td></rl<></td></rl<>	<rl< td=""><td>14.7%</td><td>6.2%</td></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 De	tected - TIC		
20	2,3-Dihydrofuran	1191-99-7	130	1 ppb	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>43.6%</td><td>10.4%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>43.6%</td><td>10.4%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>43.6%</td><td>10.4%</td></rl<></td></rl<>	<rl< td=""><td>43.6%</td><td>10.4%</td></rl<>	43.6%	10.4%		
22	2-Methylfuran	534-22-5	147	1 ppb	4	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>3.7% (DL)</td><td>2.6% (DL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>3.7% (DL)</td><td>2.6% (DL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>3.7% (DL)</td><td>2.6% (DL)</td></rl<></td></rl<>	<rl< td=""><td>3.7% (DL)</td><td>2.6% (DL)</td></rl<>	3.7% (DL)	2.6% (DL)		
8	Methanol 67-56-1 148 200 p		200 ppm	0	n/a	n/a	n/a	n/a	Not N	1easured			
21	2,5-Dihydrofuran	1708-29-8	152	1 ppb	5	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>3.1% (DL)</td><td>4.0%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>3.1% (DL)</td><td>4.0%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>3.1% (DL)</td><td>4.0%</td></rl<></td></rl<>	<rl< td=""><td>3.1% (DL)</td><td>4.0%</td></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.

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.

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

[&]quot;< RL" indicates that all pertinent measurements of the analyte were less than the reporting level

[&]quot;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.</p>
- 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.

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.

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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

- 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 furan ¹⁷ 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.

is discussed in Freeman et. al. [19].

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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

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 exhauster 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.

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

9.0 References

- 1. OSHA 29 CFR 1910.134, https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=standards&p_id=12716
- 2. OSHA Respirator Change Schedules Decision Logic Flowcharts, https://www.osha.gov/SLTC/etools/respiratory/decisionlogic/flowcharti.html
- 3. OSHA Respirator Change Schedules Mathematical Modeling, and Factors that Influence Cartridge Service Life, https://www.osha.gov/SLTC/etools/respiratory/change_schedule.html
- 4. OSHA Standard Respirator Testing Procedures, http://www.cdc.gov/niosh/npptl/stps/aprespcbrn.html
- 5. Wood, GO. Estimating Service Lives of Organic Vapor Cartridges. *Am Ind Hyg Assoc J* 1994, *55*, 11-15.
- 6. Wood, GO. Estimating Service Lives of Organic Vapor Cartridges II: A Single Vapor at All Humidities. *J Occup Environ Hyg* 2004, *1*, 472-492.
- 7. Wood, GO, JL Snyder. Estimating Service Lives of Organic Vapor Cartridges III: Multiple Vapors at All Humidities. *J Occup Environ Hyg* 2007, *4*, 363-374.
- 8. Janvier, F, L Tuduri, D Cossement, D Drolet, J Lara. Systematic Evaluation of the Adsorption of Organic Vapors onto a Miniaturized Cartridge Device using Breakthrough Tests in Parallel Experiment with a Full Size Respirator Cartridge. *Adsorpt Sci Technol* 2016, *34*, 287-306.
- 9. Yoon, YH, JH Nelson, J Lara. Respirator Cartridge Service Life: Exposure to Mixtures. *Am Ind Hyg Assoc J* 1996, *57*, 809-819.
- 10. 3M Service life software Version 3.3, http://extra8.3m.com/SLSWeb/serviceLifeDisclaimer.html?regIId=20&langCode=EN&countryNam e=United% 20States
- 11. Scotts Surelife Cartridge Calculator, https://www.scottsurelife.com/DesktopUI/SelectRegion.aspx
- 12. Respiratory Protection, Chapter 36 of the American Industrial Hygiene Association publication, *The Occupational Environment: Its Evaluation and Control and Management*, ISBN 1-931504-43-1
- 13. Industrial Hygiene Sampling and Analysis plan for Respirator Cartridge Testing, TFC-PLN-168, REV A, June 16, 2016
- 14. Air Purifying Respirator Cartridge Test Apparatus Special Tool and Equipment Evaluation, RPP-STE-59226, Rev 0, June 22, 2016.
- 15. Cohen, HJ, SP Levine, RP Garrison. Development of a Field Method for Calculating the Service Lives of Organic Vapor Cartridges Part IV. Results of field validation trials, *American Industrial Hygiene Association Journal* (1991), pages 263-270.
- 16. Scott Air Purifying Respirators (742 Twin Cartridges), https://www.scottsafety.com/en/us/DocumentandMedia1/Poster_742SelectionGuide_HS_6411_0313 https://www.scottsafety.com/en/us/DocumentandMedia1/Poster_742SelectionGuide_HS_6411_0313
- 17. Meacham JE, JO Honeyman, TJ Anderson, ML Zabel, and JL Huckaby. 2006. *Industrial Hygiene Chemical Vapor Technical Basis*. RPP-22491, Rev. 1, CH2M Hill Hanford Group, Inc., Richland, Washington.
- 18. Industrial Hygiene Exposure Assessment Strategy, TFC-PLN-34, REV E-6, Feb 22, 2013.

19. 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 Headspaces and Exhausters*. PNNL-26821 Revision 1, Pacific Northwest National Laboratory, Richland, Washington.

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 FluoroporeTM 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 TeflonTM 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, VitonTM, glass, and Masterflex C-flex tubing, which are commonly used for various vapor-sampling applications.

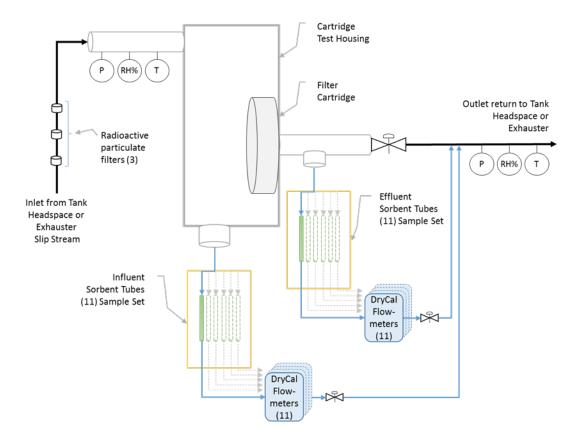


Figure A.1. General Schematic of Respirator Cartridge Test Apparatus

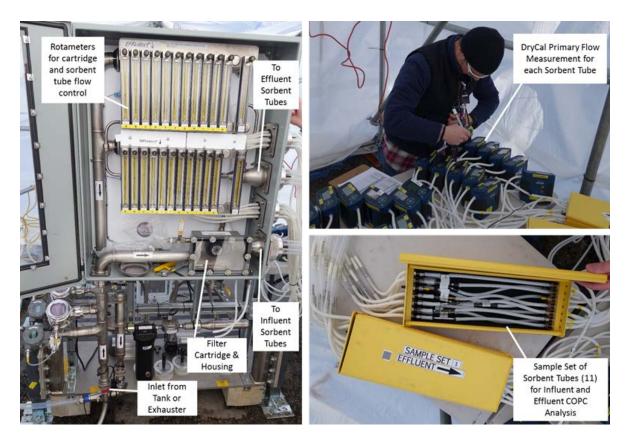


Figure A.2. Photographs of the Respirator Cartridge Test Equipment

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, Decamethlycyclopentasiloxane, 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-Pentyfuran, Furan, Tetrafuran

- Ethylamine (amines): Dimethylamine, Ethylamine, Methylamine

Acetonitrile: Acetonitrile

Mercury: MercuryAmmonia: 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

Sample Box Nu	Sample Box Number		Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2	AI	AZ	BI	BZ	Cl	C2	DI	DZ	EI	EZ	F1	FZ	5	GZ	HI	112
SVOC	Α	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	В	4.20	3.89	3.87	3.64	4.00	3.58	3.49	3.62	3.68	3.65	3.94	3.73	3.94	3.73	4.01	3.88	3.93	3.93
Furans	С	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	Е	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	Н	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	-	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 Nu	Sample Box Number		Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2	Λ1	AZ	DI	DΖ	C	C2	נט	DZ	E1	EZ	r1	FZ	GI	92	-	112
SVOC	Α	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	В	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	С	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	Ε	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	Н	199	201	207	205	208	205	204	200	200	195	201	197	199	197	200	198	199	199
1, 3-Butadiene	-	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)

Volumes All Collection (2)																			
Sample Box Nu	mber	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	F1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2	AI	AZ	DI	DZ	C	C2	נט	DZ	E1	EZ	F1	Γ2	GI	52	-	ПZ
SVOC	Α	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	В	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	С	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	Е	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	Н	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	-	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 Nu	mber	Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2	AI	AZ	DI	DΖ	3	CZ	DI	DZ	1	LZ		ΓZ	GI	52	=	112
SVOC	Α	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	В	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	С	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	Ε	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	Н	206	211	205	206	206	211	206	201	202	198	197	197	200	199	200	199	198	201
1, 3-Butadiene	_	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- Pi	re e				After 9	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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 - Po	st				After 9	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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 - Pi	·e				After 9	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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- Po	st				After 9	Sample Ta	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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 Ca	artridge (9	9/10/16 - 9	9/11/16	6) AX-101	l Heads _i	oace				
Influent- Pr	e				After	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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 - Po	st				After	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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 - Pi	re				After	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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- Po	st				After 9	Sample T	aken			
Reading	UOM	Baseline	Α	В	С	D	E	F	G	Н
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**

Page: 1

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

Sample Group: 20162747

SDG Number:

6T029731 6T029731

16T029731

S16T029731 16T029731

6T029731

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DSR.Jar v. 3.0.12

Cartridge Evaluation Data Summary Report

Det Limit | Cnt Err % Qual Flags n/a L 3.9 4.9 4.0 7.0 7.0 3.5 3.3 3.9 Result Duplicate Average RPD % Spk Rec % <3.9 <3.6 19 19 <2.4 <5.6 37 5.1 <5.6 4.0 <3.6 <0.60 Blank <3.9 <3.3 <3.9 <5.6 <3.0 STD % NGS NGS NGS Unit Customer Sample ID: 16-07837-1-BASE-EFF 2,6,10-Trimethyldodecane Dibutyl butylphosphonate ributyl phosphate **Diethylphthalate** 2-Methylphenol Cresol (m & p) Heptadecane Pentadecane lexadecane-Tetradecane Jodecane **Indecane** Analyte 3891-98-3 108-39-4M 544-76-3 126-73-8 629-78-7 629-62-9 12-40-3 92-52-4 8-46-6 4-66-2 95-48-7 R A# CAS# VAPOR-TDU SVOA #2

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit T - Tentatively Identified Compound

C.7

S16T029731

16T029731 316T029731

S16T029731

S16T029731 S16T029731

S16T029731

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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	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	SVOA #2												
S16T029732	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 L	_
S16T029732	95-48-7	2-Methylphenol	NGS	82	6.42	<4.9	n/a	n/a	n/a	n/a	4.9	n/a L	
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	_
S16T029732	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T029732	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T029732	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T029732	112-40-3	Dodecane	NGS	86	<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	e/u	3.3	n/a	
S16T029732	629-59-4	Tetradecane	NGS	110	<3.9	4.9	ηVa	n/a	n/a	n/a	3.9	n/a	
S16T029732	126-73-8	Tributyl phosphate	NGS	18	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a L	
S16T029732	629-50-5	Tridecane	NGS	96	<1.6	7.8	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029732	629-78-7	Heptadecane	NGS	100	<2.4	3.0	n/a	n/a	n/a	n/a	2.4	n/a	
S16T029732	629-62-9	Pentadecane	NGS	120	<3.0	7.8	n/a	n/a	n/a	n/a	3.0	n/a	7

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

N - Named TIC

J - Estimated

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Cartridge Evaluation Data Summary Report

Customer Sample ID: 16-07837-1-BLANK1 Customer Sample ID: 16-07837-1-BLANK1 Sample Group: 20162747 SDG Number:

Sample# R	A# CAS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	SVOA #2												
S16T029733	3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/alt	
S16T029733	95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	e/u	4.9	n/alt	
S16T029733	108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		
S16T029733	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a L	
S16T029733	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a L	
S16T029733	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a L	
S16T029733	112-40-3	Dodecane	NGS	88	<0.60	1.4	n/a	n/a	n/a	n/a	0.55	n/a	_
S16T029733	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a L	
S16T029733	629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a L	2
S16T029733	126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a L	
S16T029733	629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a L	_
S16T029733	629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a L	
S16T029733	629-62-9	Pentadecane	NGS	120	<3.0	3.0	n/a	2/0	n/a	e/u	0.6	cla	

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N - Named TIC

J - Estimated

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Cartridge Evaluation Data Summary Report

SDG Number: Customer Sample ID: 16-07837-1-BLANK2 Customer Sample ID: 16-07837-1-BLANK2

Sample Group: 20162747

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029734	3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/alu
S16T029734	95-48-7	2-Methylphenol	NGS	82	<4.9	64.9	n/a	n/a	n/a	n/a	4.9	
S16T029734	108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	
S16T029734	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	
S16T029734	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	
S16T029734	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	
S16T029734	112-40-3	Dodecane	NGS	86	<0.60	1.2	n/a	n/a	n/a	n/a	0.55	
S16T029734	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029734	629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	
S16T029734	126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	
S16T029734	629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	
S16T029734	629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	
S16T029734	629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	

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N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

J - Estimated

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % S	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	J SVOA #2											
S16T029735	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
S16T029735	95-48-7	2-Methylphenol	NGS	82	6.45	6,42	n/a	n/a	n/a	n/a	4.9	
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	0.45	<4.0	n/a	n/a	n/a	n/a	4.0	
S16T029735	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	
S16T029735	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	. n/a	n/a	n/a	n/a	7.0	
S16T029735	112-40-3	Dodecane	NGS	86	<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	9.0	n/a	n/a	n/a	n/a	3.9	n/a J
S16T029735	126-73-8	Tributyl phosphate	NGS	81	<5.6	9.5>	n/a	n/a	n/a	n/a	5.6	
S16T029735	629-50-5	Tridecane	NGS	96	<1.6	18	n/a	n/a	n/a	n/a	1.6	
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

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N - Named TIC

J - Estimated

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Sak Roc %	Det I imit	Det Limit Cat Fre W Ough Class
VAPOR-TDU SVOA #2	SVOA #2									200		can in the date of the same
S16T029736	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
S16T029736	95-48-7	2-Methylphenol	NGS	82	6.4>	6.42	1/3	n/a	n/a	n/a	4.9	
S16T029736	108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	
S16T029736	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	
S16T029736	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	
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	86	<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	
S16T029736	629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	
S16T029736	629-62-9	Pentadecane	NGS	120	<3.0	5.2	n/a	n/a	n/a	n/a	3.0	n/a J

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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 %	k Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	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	9'9>	n/a	n/a	n/a	e/u	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	86	<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

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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	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	J SVOA #2												
S16T029738	3891-98-3	2,6,10-Trimethyldodecane	SON	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	6.4.9	6.42	n/a	n/a	n/a	n/a	4.9	n/a l	2
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	
S16T029738	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	0
S16T029738	78-46-6	Dibutyl butylphosphonate	NGS	130	43.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a L	7
S16T029738	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a L	7
S16T029738	112-40-3	Dodecane	NGS	86	<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 C	5
S16T029738	629-59-4	Tetradecane	NGS	110	3.9	<3.9	n/a	n/a	n/a	e/u	3.9	n/a	,
S16T029738	126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a L	
S16T029738	629-50-5	Tridecane	NGS	96	41.6	6.2	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029738	629-78-7	Heptadecane	NGS	100	42.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a l	_
S16T029738	629-62-9	Pentadecane	NGS	120	<3.0	4.4	n/a	n/a	n/a	n/a	3.0	n/a	

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Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162747

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

	-													
Sample# R		A# CAS#	Analyte	Unit	% QTS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	NS OC	'OA #2												
S16T029739		3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/alu	٦
S16T029739	L	95-48-7	2-Methylphenol	NGS	82	<4.9	6.42	n/a	n/a	n/a	n/a	4.9		2
S16T029739		108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		0
S16T029739	L	92-52-4	Biphenyl	NGS	120	<4.0	0.4>	n/a	n/a	n/a	n/a	4.0	n/a l	2
S16T029739		78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a l	2
S16T029739		84-66-2	Diethylphthalate	NGS	110	<7.0	0.7>	n/a	n/a	n/a	n/a	7.0	n/a l	0
S16T029739		112-40-3	Dodecane	NGS	86	<0.60	17	n/a	n/a	n/a	n/a	0.55		
S16T029739		544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		0
S16T029739		629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	2
S16T029739		126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		5
S16T029739		629-50-5	Tridecane	NGS	96	41.6	0.9	n/a	n/a	n/a	n/a	1.6		-
S16T029739		629-78-7	Heptadecane	NGS	100	42.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a l	٦
S16T029739		629-62-9	Pentadecane	NGS	120	<3.0	4.4	n/a	n/a	n/a	n/a	3.0		-

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U - Less Than Detection Limit T - Tentatively Identified Compound

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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	A# CAS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU SVOA #2	I 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 L	
S16T029740	95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		1
S16T029740	108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		1
S16T029740	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		
S16T029740	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		
S16T029740	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		-
S16T029740	112-40-3	Dodecane	NGS	86	<0.60	23	n/a	n/a	n/a	n/a	0.55		
S16T029740	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	e/u	n/a	n/a	3.3	n/a L	
S16T029740	629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		
S16T029740	126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		
S16T029740	629-50-5	Tridecane	NGS	96	<1.6	6.7	n/a	n/a	n/a	n/a	1.6		
S16T029740	629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a L	
S16T029740	629-62-9	Pentadecane	NGS	120	<3.0	3.0	n/a	n/a	n/a	n/a	3.0	n/a	

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Cartridge Evaluation Data Summary Report

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

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Sample# R	A# CAS#		Analyte	Unit	% dus	Blank	Result	Duplicate	Average	RPD % Spk Rec %	Rec %	Det Limit C	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	U 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	6.49	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	0.42	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	86	<0.60	33	n/a	n/a	n/a	n/a	0.55	n/a
S16T029741	544-76-3	1000	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029741	629-59-4	0.0%	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

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N - Named TIC

J - Estimated

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TD	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 l	1
S16T029742	95-48-7	2-Methylphenol	NGS	82	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a l	_
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 l	1
S16T029742	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a l	-
S16T029742	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a l	1
S16T029742	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a l	1
S16T029742	112-40-3	Dodecane	NGS	86	<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 l	_
S16T029742	629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a l	1
S16T029742	126-73-8	Tributyl phosphate	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a l	
S16T029742	629-50-5	Tridecane	NGS	96	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a,	_
S16T029742	629-78-7	Heptadecane	NGS	100	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a l	
S16T029742	629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a U	-

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J - Estimated

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Cartridge Evaluation Data Summary Report

Sample Group: 20162747
SDG Number:
Customer Sample ID: 16-07837-1-IN-A
Customer Sample ID: 16-07837-1-IN-A

Sample# R	A# CAS#	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU SVOA #2	ONS NO	A #2												
S16T029743	6)	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	
S16T029743	6	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	9,	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U	
S16T029743	7.	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	80	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a U	
S16T029743	1	112-40-3	Dodecane	NGS	86	<0.60	42	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029743	5	544-76-3	Hexadecane-	NGS	130	<3.3	4.1	e/u	n/a	n/a	n/a	3.3	n/a J	
S16T029743	9	629-59-4	Tetradecane	NGS	110	<3.9	6.2	n/a	n/a	n/a	n/a	3.9	n/a J	
S16T029743	1.	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	9	629-50-5	Tridecane	NGS	96	41.6	19	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029743	6,	629-78-7	Heptadecane	NGS	100	<2.4	5.1	n/a	n/a	n/a	n/a	2.4	n/a J	
S16T029743	6.	629-62-9	Pentadecane	NGS	120	<3.0	6.7	n/a	n/a	n/a	n/a	3.0	n/a J	

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec %	39c %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2									1		
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	86	<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	ηva	n/a	n/a	n/a	1.6	n/a
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

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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	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU SVOA #2	I SVOA #2											
S16T029745	3891-98-3	2,6,10-Trimethyldodecane	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	86	<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	1	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	

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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	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029746	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
S16T029746	95-48-7	2-Methylphenol	NGS	82	6.43	6.4>	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	86	<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

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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 A	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec %	% oes	Det Limit Cnt Err % Qual Flags	r % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029747	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
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	86	<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	18	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029747	629-50-5	Tridecane	NGS	96	41.6	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

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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	A# CAS#	Analyte	Unit	% OTS	Blank	Result	Duplicate	Average	-	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	U SVOA #2											
S16T029748	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
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	86	<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

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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	Chilt	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029749	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
S16T029749	95-48-7	2-Methylphenol	NGS	82	<4.9	6,49	n/a	n/a	n/a	n/a	4.9	
S16T029749	108-39-4M	Cresol (m & p)	NGS	81	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	
S16T029749	92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	
S16T029749	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	
S16T029749	84-66-2	Diethylphthalate	NGS	110	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	
S16T029749	112-40-3	Dodecane	NGS	86	<0.60	8.6	n/a	n/a	n/a	n/a	0.55	
S16T029749	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	
S16T029749	629-59-4	Tetradecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	
S16T029749	126-73-8	Tributyl phosphate	NGS	18	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	
S16T029749	629-50-5	Tridecane	NGS	96	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	
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	

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

N - Named TIC

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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

		The state of the s										
Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	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	6.49	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	86	<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	9.5>	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

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

N - Named TIC

J - Estimated

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

Qual Flags 78 JNT 22 JNT 39 JNT 34 JNT 88 JNT 46 JNT 280 JNT 12 JNT E1 JNT NGS NGS NGS NGS NGS NGS NGS NGS Retention Time (Minutes) 5.10 3.66 5.18 5.45 5.50 5.71 6.60 29812-79-1 556-67-2 1461-27-4 62108-27-4 98-86-2 1120-21-4 2613-61-8 541-02-6 95-16-9 74381-40-1 CAS No. Cyclotetrasiloxane, octamethyl Cyclohexene, 1-methyl-5-(1-met Heptane, 2,4,6-trimethyl-Decamethlycyclopentasiloxane Propanoic acid, 2-methyl-, 1-(Hydroxylamine, O-decyl-Decane, 2,4,6-trimethyl-Acetophenone Senzothiazole Jndecane Analyte QC Type vAPOR-TDU SVOA #2 16T029731 \$167029731 16T029731 S16T029731 16T029731 S16T029731 S16T029731 16T029731 S16T029731 S16T029731

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

N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162747 SDG Number:

and the same	₩	QC Type	Analyte	CAS No.	(Minutes)	Chit	Recuit	Ousi Flage
VAPOR-TDU SVOA #2	VOA	#2						ı
S16T029732			Hexanal	66-25-1	2.80	NGS	26	26 JNT
S16T029732			Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	76	76 JNT
S16T029732			Hexanal, 5-methyl-	1860-39-5	3.67	NGS	51	TNC
S16T029732			Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	Z70 JNT	JNT
S16T029732			D-Limonene	5989-27-5	4.86	NGS	72	72 JNT
S16T029732			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	23	23 JNT
S16T029732			Acetophenone	98-86-2	5.18	NGS	15	15 JNT
16T029732			Undecane	1120-21-4	5.45	NGS	47	47 JNT
S16T029732	П		Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	88	TNL 68
S16T029732			Benzothiazole	95-16-9	6.59	NGS	31	TNL
S16T029732			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	17	TNL 71
S16T029732			Undecane, 2-methyl-	7045-71-8	7.26	NGS	15	15 JNT

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

N - Named TIC

J - Estimated

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	#W	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Chit	Result	Oual Flags
VAPOR-TDU §	SVOA	#2						0
S16T029734			Cyclotrisiloxane, hexamethyl-	541-05-9	2.85	NGS	32	32 JNT

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

J - Estimated

N - Named TIC

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162747 SDG Number:

Sample# R	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flaos
VAPOR-TDU SVOA #2	/OA #2						0
S16T029735		Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	93	93 JNT
S16T029735		2,4,6,8-Tetramethyl-1-undecene	59920-26-2	3.66	NGS	TNC 84	JNT
\$167029735		Benzaldehyde	100-52-7	4.25	NGS	Z8 JNT	TNC
S16T029735		Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	220 JNT	INI
S16T029735		Phenol	108-95-2	4.41	NGS	TNL 65	TNC
S16T029735		D-Limonene	5989-27-5	4.86	NGS	110 JNT	TNL
S16T029735		Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	34 JNT	TNI
S16T029735		Acetophenone	98-86-2	5.19	NGS	31 JNT	TNS
S16T029735		Octane, 2,3,6,7-tetramethyl-	52670-34-5	5.39	NGS	Z8 JNT	TNC
S16T029735		Undecane	1120-21-4	5.45	NGS	TNL 18	TNC
\$16T029735		Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	75	75 JNT
S16T029735		Benzothiazole	95-16-9	6.61	NGS	45 JNT	TNI
S16T029735		Dodecane, 2,7,10-trimethyl-	74645-98-0	6.90	NGS	31 JNT	INI
S16T029735		Dodecane, 2,6,11-trimethyl-	31295-56-4	6.97	NGS	8.6 JNT	INI
S16T029735		Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	TNC 72	TNC
S16T029735		Undecane, 3,7-dimethyl-	17301-29-0	7.26	NGS	Z8 JNT	TNI
S16T029735		Propanoic acid, 2-methyl-, 1-(74381-40-1	9.19	NGS	TNI. 95	TNI

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

N - Named TIC

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20162747

SDG Number:

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

Qual Flags

Result

TNL 16

TA JAT

26 JNT

32 JNT

360 JNT

93 JNT

92 JNT

46 JNT

150 JNT

48 JNT 140 JNT

44 JNT

68 JNT 42 JNT

25 JNT 100 JNT 34 JNT

NGS 2.91 3.67 5.10 5.19 5.39 5.45 5.52 5.71 3.23 4.37 6.90 7.07 541-02-6 95-16-9 61141-72-8 5989-27-5 62108-27-4 98-86-2 17312-44-6 31295-56-4 1860-39-5 100-52-7 1120-21-4 625-74-1 75-98-9 556-67-2 108-95-2 541-05-9 112-25-4 540-97-6 CAS No. 66-25-1 Dodecamethylcyclohexasiloxane Dodecane, 2,6,11-trimethyl-Decamethlycyclopentasiloxane Benzothiazole Cyclotetrasiloxane, octamethyl Propanoic acid, 2,2-dimethyl-Hexanal, 5-methyl-Cyclotrisiloxane, hexamethyl-Propane, 2-methyl-1-nitro-Decane, 2,4,6-trimethyl-Dodecane, 4, 6-dimethyl Customer Sample ID: 16-07837-1-EFF-B Ethanol, 2-(hexyloxy)-3.3-Dimethyldecane Acetophenone Benzaldehyde D-Limonene Jndecane Hexanal Analyte Phenol QC Type VAPOR-TDU SVOA #2 ₩ œ S16T029736 S16T029736 316T029736 316T029736 S16T029736 S16T029736 S16T029736 S16T029736 316T029736 16T029736 S16T029736 S16T029736 I6T029736 S16T029736 S16T029736 S16T029736 Sample#

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit T - Tentatively Identified Compound

C.31

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	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Recuit	Oual Flage
VAPOR-TDU SVOA #2	SVOA	#2						e Rational State of the State o
S16T029737			Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	TNL 63	TNC
S16T029737			Propane, 2-methyl-1-nitro-	625-74-1	3.17	NGS	33 JNT	TNC
S16T029737			2,4,6,8-Tetramethyl-1-undecene	59920-26-2	3.66	NGS	TNC 14	TNC
S16T029737			Benzaldehyde	100-52-7	4.24	NGS	Z7 JNT	TNC
S16T029737			Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	160 JNT	TNC
S16T029737			Phenol	108-95-2	4.40	NGS	38 JNT	TNC
S16T029737			D-Limonene	5989-27-5	4.86	NGS	100 JNT	TNC
S16T029737			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	32 JNT	TNI
S16T029737			Acetophenone	98-86-2	5.19	NGS	36 JNT	TNL
S16T029737			Undecane	1120-21-4	5.45	NGS	SS JNT	INI
S16T029737			Ethanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	30 JNT	TNL
S16T029737			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	TNL 05	TNL
S16T029737			Benzothiazole	95-16-9	6.60	NGS	37 JNT	TNI
S16T029737			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	TNI 16	TNI

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit T - Tentatively Identified Compound

J - Estimated

N - Named TIC

C.32

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162747

SDG Number:

Qual Flags TNL 89 140 JNT 76 JNT 21 JNT 53 JNT 74 JNT 27 JNT TNC 11 Result NGS NGS 5.45 5.71 6.89 2.91 4.35 4.86 5.10 541-05-9 556-67-2 5989-27-5 62108-27-4 1120-21-4 541-02-6 95-16-9 31295-56-4 CAS No. Decamethlycyclopentasiloxane Benzothiazole Cyclotrisiloxane, hexamethyl-Cyclotetrasiloxane, octamethyl Dodecane, 2,6,11-trimethyl-Decane, 2,4,6-trimethyl-Customer Sample ID: 16-07837-1-EFF-D D-Limonene Undecane Analyte QC Type VAPOR-TDU SVOA #2 A# œ \$16T029738 \$16T029738 \$16T029738 \$16T029738 S16T029738 S16T029738 S16T029738 Sample#

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

N - Named TIC

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

Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Doeult	Out Class
VAPOR-TDU SVOA #2	VOA	#2					Moony	edal riags
S16T029739			Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	. 72	TNL
S16T029739			Hydroxylamine, O-decyl-	29812-79-1	3.67	NGS	29	ZO JINT
S16T029739			Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	120	120 JNT
S16T029739			Phenol	108-95-2	4.40	NGS	31	TNL
S16T029739			D-Limonene	5989-27-5	4.86	NGS	59	TNL 69
S16T029739			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	16	TNL 91
S16T029739			Undecane	1120-21-4	5.45	NGS	43	43 INT
S16T029739			Heptane, 2,4,6-trimethyl-	2613-61-8	5.51	NGS	16	TNI. 81
S16T029739	Г		Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	28	S8 JNT
S16T029739			Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	14	TNC 41
S16T029739			Propanoic acid, 2-methyl-, 1-(74381-40-1	9.18	NGS	41	TNI TNI

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

J - Estimated

N - Named TIC

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	₩.	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result
VAPOR-TDU SVOA #2	SVOA	#2					L
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	TNL 50
S16T029740			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	13 JNT
S16T029740			Undecane	1120-21-4	5.45	NGS	TNC 75
S16T029740			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	64 JNT
S16T029740			Benzothiazole	95-16-9	6:28	NGS	TNL 82

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

U - Less Than Detection Limit T - Tentatively Identified Compound

J - Estimated

N - Named TIC

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	A#	dC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flage
VAPOR-TDU SVOA #2	USVO	A #2						1
S16T029741	-		Cyclotrisiloxane, hexamethyl-	541-05-9	2:92	NGS	170	TNC 071
S16T029741			Heptane, 2,4-dimethyl-	2213-23-2	2.98	NGS	52	52 JNT
S16T029741			Octane, 4-methyl-	2216-34-4	3.34	NGS	35	35 JNT
S16T029741	-		Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	190	TNL 061
S16T029741			1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	36	36 JNT
S16T029741			D-Limonene	5989-27-5	4.86	NGS	58	58 JNT
S16T029741	_		Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	80	TNL 08
S16T029741	_		2,3-Dimethyldecane	17312-44-6	5.39	NGS	30	30 JNT
S16T029741			Undecane	1120-21-4	5.46	NGS	170 JNT	INL
S16T029741			2,6-Dimethyldecane	13150-81-7	5.50	NGS	27	27 JNT
S16T029741			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	51	TNL
S16T029741	_		Dodecane, 2,6,11-trimethyl-	31295-56-4	68.9	NGS	15	15 JNT

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

N - Named TIC

J - Estimated

U - Less Than Detection Limit T - Tentatively Identified Compound

C.36

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162747 SDG Number:

Sample# R	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Recuit	Out Flags
VAPOR-TDU SVOA #2	/OA #2						1
S16T029742		Cyclotrisiloxane, hexamethyl-	541-05-9	2.91	NGS	73	73 JNT
S16T029742		Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	80	TNL 08
S16T029742		Cyclohexene, 1-methyl-5-(1-met	1461-27-4	4.86	NGS	40	TNL 01
S16T029742		Undecane	1120-21-4	5.44	NGS	31	31 JNT
S16T029742		Decane, 2,4,6-trimethyl-	62108-27-4	5.50	NGS	14	14 JNT
S16T029742		Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	49	49 JNT
S16T029742		Propanoic acid, 2-methyl-, 1-(74381-40-1	9.18	NGS	53	53 JNT

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

N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

Carridge Eval
Data Summary

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

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

Sample Group: 20162747

SDG Number:

Qual Flags 350 JNT 25 JNT 150 JNT 54 JNT 160 JNT 24 JNT 27 JNT 57 JNT TNL 99 30 JNT 52 JNT 110 JNT 29 JNT 150 JNT 46 JNT 110 JNT 55 JNT 47 JNT 12 JNT 39 JNT 47 JNT NGS 3.20 3.53 3.66 5.10 5.19 5.50 4.37 4.41 4.82 5.45 5.72 6.60 96.9 7.26 9.19 7.07 1120-21-4 62108-27-4 13150-81-7 59920-26-2 104-76-7 74645-98-0 31295-56-4 17301-29-0 74381-40-1 541-05-9 556-67-2 108-95-2 623-56-3 100-52-7 112-25-4 541-02-6 122-99-6 540-97-6 625-74-1 98-86-2 589-53-7 CAS No. 95-16-9 2,4,6,8-Tetramethyl-1-undecene Dodecamethylcyclohexasiloxane Decamethlycyclopentasiloxane Cyclotetrasiloxane, octamethyl Undecane, 3,7-dimethyl-Propanoic acid, 2-methyl-, 1-(Cyclotrisiloxane, hexamethyl-Dodecane, 2,7,10-trimethyl-Dodecane, 2,6,11-trimethyl-Propane, 2-methyl-1-nitro-Decane, 2,4,6-trimethyl-3-Hexanone, 5-methyl-Ethanol, 2-(hexyloxy)-2,6-Dimethyldecane Acetophenone Ethanol, 2-phenoxyleptane, 4-methyl-1-Hexanol, 2-ethyl-Benzaldehyde Benzothiazole D-Limonene Jndecane Phenol Analyte QC Type VAPOR-TDU SVOA #2 # œ S16T029743 S16T029743 16T029743 16T029743 S16T029743 S16T029743 16T029743 S16T029743 S16T029743 6T029743 I6T029743 6T029743 6T029743 I6T029743 16T029743 S16T029743 S16T029743 S16T029743 S16T029743 6T029743 I6T029743 S16T029743 S16T029743 Sample#

- Estimated

J - Estimated

N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

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

Sample# R	*	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flace
VAPOR-TDU SVOA #2	SVOA	#2						200
S16T029750			Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	41	TNL 11
S16T029750			3-Hexanone, 5-methyl-	623-56-3	3.53	NGS	130	30 JNT
S16T029750			3-Hexanol, 5-methyl-	623-55-2	3.63	NGS	38	38 JNT
S16T029750			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	11	7 JNT
S16T029750			Decane, 2,4,6-trimethyl-	62108-27-4	5.09	NGS	5.6 JNT	JNT
S16T029750			Undecane	1120-21-4	5.44	NGS	25	25 JNT
S16T029750			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	41	TNC 13

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

N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

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Sample Group: 20162850

SDG Number:

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

Cartridge Evaluation Data Summary Report

Sample# R	A# CAS#	Analyte	Unit	% dıs	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029755	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<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	6.4.9	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	16	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U
S16T029755	78-46-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T029755	84-66-2	Diethylphthalate	NGS	06	<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

U - Less Than Detection Limit T - Tentatively Identified Compound

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162850

Sample# R A	A# CAS#	Analyte	Unit	% ats	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	tual Flags
VAPOR-TDU SVOA #2	SVOA #2												
S16T029756	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a L	
S16T029756	95-48-7	2-Methylphenol	NGS	87	6.42	44.9	n/a	n/a	n/a	n/a	4.9	n/a t	
S16T029756	108-39-4M	Cresol (m & p)	NGS	87	<5.6	<5.6	n/a	n/a	e/u	n/a	5.6	n/a L	
S16T029756	92-52-4	Biphenyl	NGS	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T029756	78-46-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a L	
S16T029756	84-66-2	Diethylphthalate	NGS	06	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a L	
S16T029756	112-40-3	Dodecane	NGS	85	<0.60	25	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	
S16T029756	629-59-4	Tetradecane	NGS	93	<3.9	7.5	n/a	n/a	n/a	n/a	3.9	n/a	
S16T029756	126-73-8	Tributyl phosphate	NGS	75	<5.6	45.6	n/a	n/a	n/a	n/a	5.6	n/a L	
S16T029756	629-50-5	Tridecane	NGS	88	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029756	629-78-7	Heptadecane	NGS	95	<2.4	3.2	n/a	n/a	n/a	n/a	2.4	n/a	
S16T029756	629-62-9	Pentadecane	NGS	100	<3.0	4.5	n/a	n/a	n/a	n/a	3.0	n/a	

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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	A# CAS#	Analyte	Unit	CTD 0	Blank	Recuit	Dunifcato	Average	W Uda	RDD % Cab Doc %	Dot I imit	Dot I imit one From Day	[
	1000			200			omnuda.	ofference	2 2	מאט שלה	200	OIL EIL 76 QUAI FIR	ags
VAPOR-TDU SVOA #2	U SVOA #2												Ī
S16T029757	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a U	Γ
S16T029757	95-48-7	2-Methylphenol	NGS	87	<4.9	6.4>	n/a	n/a	n/a	n/a	4.9	n/a U	Γ
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 U	Γ
S16T029757	92-52-4	Biphenyl	SON	91	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U	Γ
S16T029757	78-46-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U	Г
S16T029757	84-66-2	Diethylphthalate	NGS	06	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a U	Г
S16T029757	112-40-3	Dodecane	NGS	92	<0.60	28	n/a	n/a	n/a	n/a	0.55	n/a E	Г
S16T029757	544-76-3	Hexadecane-	NGS	110	<3.3	5.5	n/a	n/a	n/a	n/a	3.3	n/a J	Γ
S16T029757	629-59-4	Tetradecane	NGS	93	<3.9	9.3	n/a	n/a	n/a	n/a	3.9	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 U	Г
S16T029757	629-50-5	Tridecane	NGS	88	<1.6	32	n/a	n/a	n/a	n/a	1.6	n/a	Γ
S16T029757	629-78-7	Heptadecane	NGS	98	<2.4	0.9	n/a	n/a	n/a	n/a	2.4	n/a J	Γ
S16T029757	629-62-9	Pentadecane	NGS	100	<3.0	9.2	n/a	n/a	n/a	n/a	3.0	n/a J	Г

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

Sample# R A	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD % Spk Rec %	ok Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029758	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<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	6.49	<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	9.5>	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	86	<3.6	<3.6	n/a	n/a	e/u	n/a	3.6	n/a U
S16T029758	84-66-2	Diethylphthalate	NGS	06	<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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162850

Sample# R A	A# CAS#	Analyte	Unit	% aus	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2							20				100
S16T029759	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<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	6.4>	<4.9	n/a	n/a	n/a	n/a	4.9	n/a U
S16T029759	108-39-4M	Cresol (m & p)	NGS	87	9.5>	<5.6	n/a	n/a	n/a	n/a	9.6	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	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T029759	84-66-2	Diethylphthalate	NGS	06	<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	e/u	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	0.9	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	9.6	n/a	n/a	n/a	n/a	3.0	n/a J

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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	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	J SVOA #2											
S16T029760	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<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	6.49	n/a	n/a	n/a	n/a	4.9	n/a U
S16T029760	MP-39-4M	Cresol (m & p)	NGS	87	9.5>	<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	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T029760	84-66-2	Diethylphthalate	NGS	06	<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	9.5>	<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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162850

Sample# R	A# CAS#	Analyto	Unit	% QLS	Blank	Result	Duplicate	Average	RPD % Spk Rec %	k Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029761	3891-98-3	2,6,10-Trimethyldodecane	NGS	68	<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	6.4>	6.4>	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	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T029761	84-66-2	Diethylphthalate	NGS	06	<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	e/u	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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162850

Sample# R	A# CAS#	11:	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TD	VAPOR-TDU SVOA #2	2											
S16T029762	3891-98-3	-98-3	2,6,10-Trimethyldodecane	NGS	88	<3.9	<3.9	n/a	n/a	n/a	e/u	3.9	n/a U
S16T029762	95-48-7	1-1	2-Methylphenol	NGS	87	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a U
S16T029762	108-3	M5-86-801	Cresol (m & p)	NGS	87	9.5>	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029762	92-25-4	5.4	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	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a U
S16T029762	84-66-2	5-2	Diethylphthalate	NGS	06	<7.0	<7.0	n/a	n/a	n/a	e/u	7.0	n/a U
S16T029762	112-40-3	police.	Dodecane	NGS	85	<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	e/u	e/u	3.3	n/a U
S16T029762	629-59-4	59-4	Tetradecane	NGS	63	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a U
S16T029762	126-73-8	13-8	Tributyl phosphate	NGS	7.5	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029762	629-50-5	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	1-8-7	Heptadecane	NGS	98	<2.4	<2.4	n/a	n/a	e/u	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

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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 A	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit Cnt Err % Qual Flags	ial Flags
VAPOR-TDU SVOA #2	SVOA #2											
S16T029763	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<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	9.5>	<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	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6 n/a U	
S16T029763	84-66-2	Diethylphthalate	NGS	06	<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	63	<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	9'9>	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	e/u	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	Г

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

N - Named TIC

J - Estimated

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162850

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD % Spk Rec %	Rec %	Det Limit Cnt Err % Qual Flags	of Flags
VAPOR-TDU SVOA #2	U SVOA #2											
S16T029768	3891-98-3	2,6,10-Trimethyldodecane	NGS	88	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9 n/a U	
S16T029768	95-48-7	2-Methylphenol	NGS	87	<4.9	6.4.9	n/a	n/a	n/a	n/a	4.9 n/a U	
S16T029768	108-39-4M	Cresol (m & p)	NGS	87	<5.6	9.5>	n/a	n/a	n/a	n/a	5.6 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 U	
S16T029768	78-46-6	Dibutyl butylphosphonate	NGS	86	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6 n/a U	
S16T029768	84-66-2	Diethylphthalate	NGS	06	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0 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	
S16T029768	544-76-3	Hexadecane-	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3 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 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 U	
S16T029768	629-50-5	Tridecane	NGS	88	<1.6	18	n/a	n/a	n/a	n/a	1.6 n/a	
S16T029768	629-78-7	Heptadecane	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4 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 J	

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N - Named TIC

U - Less Than Detection Limit T - Tentatively Identified Compound

Sample Group: 20162850 SDG Number:

Cartridge Evaluation Data Summary Report

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

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

Sample# R	₩	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T029755			Propanoic acid, 2,2-dimethyl-	75-98-9	3.21	NGS	35	35 JNT
S16T029755			Heptanal	111-71-7	3.66	NGS	40	40 JNT
S16T029755			Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	120	120 JNT
S16T029755			Nonane, 2,2,3-trimethyl-	55499-04-2	4.49	NGS	58	58 JNT
S16T029755			Decane	124185	4.56	NGS	14	14 JNT
S16T029755			D-Limonene	5989-27-5	4.86	NGS	120 JNT	JNL
S16T029755			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	06	TNL 06
S16T029755			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	20	20 JNT
S16T029755			Acetophenone	98-86-2	5.19	NGS	31	31 JNT
S16T029755			2,3-Dimethyldecane	17312-44-6	5.39	NGS	26	26 JNT
S16T029755			Undecane	1120-21-4	5.45	NGS	82	82 JNT
S16T029755			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	62	62 JNT
S16T029755			Hexanoic acid, 2-ethyl-	149-57-5	5.85	NGS	28	28 JNT
S16T029755			Undecane, 2-methyl-	7045718	0.00	NGS	5.2 JNT	JNT
S16T029755			Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.2 JNT	TNC
S16T029755	1		Benzothiazole	95-16-9	6.60	NGS	40	40 JNT
S16T029755			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.90	NGS	33	33 JNT
S16T029755			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	28	28 JNT
S16T029755			Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	21	21 JNT
S16T029755			Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	12	12 JNT
S16T029755		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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

N - Named TIC

J - Estimated

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	**		4		Retention Time		33	
The state of the s	\$	ac iype	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	800	142						
S16T029756			Cyclotrisiloxane, hexamethyl-	541-05-9	2.89	NGS	JNL 30	E
S16T029756			Propanoic acid, 2,2-dimethyl-	6-86-94	3.28	NGS	TNL 08	ш
S16T029756			Heptanal	111-71-7	3.67	NGS	TNL 53	E
S16T029756			Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	TNL 091	Ŀ
S16T029756		5-27	2,2,7,7-Tetramethyloctane	1071-31-4	4.48	NGS	Z8 JNT	E
S16T029756			Decane	124185	4.57	NGS	ZO JNT	E
S16T029756			3-Hexanol, 2,2-dimethyl-	4209-90-9	4.60	NGS	Z8 JNT	F
S16T029756			D-Limonene	5989-27-5	4.86	NGS	TNL 081	E
S16T029756			Decane, 3,7-dimethyl-	17312-54-8	90'9	NGS	130 JNT	ш.
S16T029756			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	JNL 86	F
S16T029756			Acetophenone	98-86-2	5.19	NGS	TNL 63	1
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	TNL 08	E
S16T029756			Ethanol, 2-(hexyloxy)-	112-25-4	5.53	NGS	32 JNT	_
S16T029756			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	TNL 88	±
S16T029756			Undecane, 2-methyl-	7045718	6.00	NGS	TNL 8.8	т
S16T029756			Undecane, 3-methyl-	1002433	6.05	NGS	TNL 7.7	F
S16T029756			Benzothiazole	95-16-9	6.61	NGS	TZ JNT	_
S16T029756			Ethylene diacrylate	2274-11-5	6.67	NGS	TNL 26	1
S16T029756			Decane, 2,3,5,8-tetramethyl-	192823-15-7	06'9	NGS	TNL 55	_
S16T029756			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	TNL 36	F
S16T029756			Dodecane, 4,6-dimethyl-	61141728	7.27	NGS	TNL 37	_
S16T029756			Dodecane, 2,6,11-trimethyl-	31295-56-4	7.41	NGS	TNL 71	_
S16T029756		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	
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J - Estimated

N - Named TIC

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# QC Type	se Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	VOA #2						
S16T029757		Propanoic acid, 2,2-dimethyl-	75-98-9	3.27	NGS	48	48 JNT
S16T029757		Heptanal	111-71-7	3.67	NGS	38	38 JNT
S16T029757		Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	140	140 JNT
16T029757		Decane	124185	4.56	NGS	15	15 JNT
S16T029757		D-Limonene	5989-27-5	4.86	NGS	19	TNL 79
S16T029757		Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	84	84 JNT
S16T029757		Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	28	28 JNT
S16T029757		Acetophenone	98-86-2	5.19	NGS	47	47 JNT
S16T029757		Undecane	1120-21-4	5.45	NGS	66	TNL 66
S16T029757		Ethanol, 2-(hexyloxy)-	112-25-4	5.53	NGS	26	26 JNT
S16T029757		Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	99	TNL 99
S16T029757		Hexanoic acid, 2-ethyl-	149-57-5	5.86	NGS	31	31 JNT
S16T029757		Undecane, 2-methyl-	7045718	6.00	NGS	6.1	6.1 JNT
S16T029757		Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.7	5.7 JNT
S16T029757		Benzothiazole	95-16-9	6.61	NGS	59	59 JNT
S16T029757		Decane, 2,3,5,8-tetramethyl-	192823-15-7	06.90	NGS	38	38 JNT
S16T029757		Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	31	31 JNT
S16T029757		Dodecne, 4,6-dimethyl-	61141728	7.26	NGS	26	26 JNT
S16T029757		Dodecane, 2,6,11-trimethyl-	31295-56-4	7.40	NGS	15	15 JNT
S16T029757		Propanoic acid, 2-methyl-, 1-(74381-40-1	9.18	NGS	28	28 JNT
S16T029757	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-D Customer Sample ID: 16-08068-1-EFF-D

Sample# R	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T029758			Propanoic acid, 2,2-dimethyl-	75-98-9	3.26	NGS	43	43 JNT
S16T029758			Heptanal	111-71-7	3.67	NGS	40	40 JNT
S16T029758			Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	140 JNT	TNC
S16T029758			Decane	124185	4.56	NGS	12	12 JNT
S16T029758			D-Limonene	5989-27-5	4.86	NGS	84	84 JNT
S16T029758			Decane, 3,7-dimethyl-	17312-54-8	5.06	NGS	82	82 JNT
S16T029758			Decane, 2,4,6-trimethyl-	62108-27-4	5.11	NGS	27	27 JNT
S16T029758			Acetophenone	98-86-2	5.19	NGS	42	42 JNT
\$167029758			Undecane	1120-21-4	5.45	NGS	06	TNL 06
S16T029758			Ethanol, 2-(hexyloxy)-	112-25-4	5.52	NGS	27	27 JNT
S16T029758			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	92	76 JNT
S16T029758			Heptanoic acid, 2-ethyl-	3274-29-1	5.86	NGS	34	34 JNT
S16T029758			Undecane, 2-methyl-	7045718	6.00	NGS	F.4 JNT	JNT
S16T029758			Undecane, 3-methyl-	1002-43-3	6.05	NGS	5.1 JNT	TNL
S16T029758			Benzothiazole	95-16-9	6.61	NGS	48	48 JNT
S16T029758			Decane, 2,3,5,8-tetramethyl-	192823-15-7	06.90	NGS.	38	38 JNT
S16T029758			Dodecamethylcyclohexasiloxane	540-97-6	70.7	NGS	33	33 JNT
S16T029758			Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	23	23 JNT
S16T029758			Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	10	TNL 01
S16T029758		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	1	

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Cartridge Evaluation Data Summary Report

Sample Group: 20162850

SDG Number:

Qual Flags

Result

26 JNT

32 JNT

27 JNT 110 JNT

B3 JNT

TNL 97

7.8 JNT

25 JNT 31 JNT 82 JNT 66 JNT

48 JNT 26 JNT

TNL 72 7.6 JNT

Sample# R	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	
VAPOR-TDU SVOA #2	SVOA !	#2					
S16T029759			Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	
S16T029759			Propanoic acid, 2,2-dimethyl-	75-98-9	3.15	NGS	
S16T029759			Heptanal	111-71-7	3.66	NGS	
S16T029759			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	
S16T029759			Decane	124185	4.56	NGS	
S16T029759			D-Limonene	5989-27-5	4.86	NGS	
S16T029759			Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	
S16T029759			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	
\$167029759			Acetophenone	98-86-2	5.19	NGS	
S16T029759			Undecane	1120-21-4	5.45	NGS	
S16T029759			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	
S16T029759			Benzothiazole	95-16-9	09.9	NGS	
S16T029759			Decane, 2,3,5,8-tetramethyl-	192823-15-7	6.89	NGS	
S16T029759			Dodecamethylcyclohexasiloxane	540-97-6	7.07	NGS	
S16T029759			Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	
S16T029759			Dodecane, 2,6,11-trimethyl-	31295564	7.40	NGS	
S16T029759		BLNK	Chrysene-D12	1719-03-5	44.02	NOO	

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J - Estimated

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	*	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	1 #2						ı
S16T029760			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	62	TNL 87
S16T029760			Cyclohexene, 1-methyl-5-(1-met	1461-27-4	4.86	NGS	46	46 JNT
S16T029760			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	15	TNL 31
S16T029760			Acetophenone	98-86-2	5.18	NGS	17	TUC 71
S16T029760			Undecane	1120-21-4	5.45	NGS	62	62 JNT
S16T029760			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	54	JNT
S16T029760			Undecane, 2-methyl-	7045718	9.00	NGS	5.1	5.1 JNT
S16T029760			Undecane, 3-methyl-	1002433	6.05	NGS	5.0	5.0 JNT
S16T029760			Benzolhiazole	95-16-9	09'9	NGS	39	39 JNT
S16T029760			Dodecane, 4,6-dimethyl-	61141728	7.25	NGS	12	TNC
S16T029760			Dodecane, 2,6,11-trimethyl-	31295-56-4	7.40	NGS	5.4	5.4 JNT
S16T029760		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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J - Estimated

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	₹	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags	
VAPOR-TDU SVOA #2	SVOA	#2							,_
S16T029761		22	Cyclotrisiloxane, hexamethyl-	541-05-9	2.95	NGS	81	NT 18	_
S16T029761			Cyclotetrasiloxane, octamethyl	556-67-2	4.37	NGS	120	120 JNT	_
S16T029761			Decane	124185	4.56	NGS	13	13 JNT	_
S16T029761			1-Hexanol, 2-ethyl-	104-76-7	4.83	NGS	34	34 JNT	_
S16T029761			D-Limonene	5989-27-5	4.86	NGS	36	36 JNT	_
S16T029761			Decane, 3,7-dimethyl-	17312-54-8	5.07	NGS	130	130 JNT	_
S16T029761			2,6-Dimethyldecane	13150-81-7	5.11	NGS	55	55 JNT	_
S16T029761			5-Ethyl-1-nonene	19780-74-6	- 5.25	NGS	30	30 JNT	_
S16T029761			2,3-Dimethyldecane	17312-44-6	5.39	NGS	26	26 JNT	_
S16T029761		1	Undecane	1120-21-4	5.47	NGS	150	150 JNT	_
S16T029761			Decane, 2,4,6-trimethyl-	62108-27-4	5.51	NGS	31	31 JNT	_
S16T029761			Decamethlycyclopentasiloxane	541-02-6	5.72	NGS	40	40 JNT	_
S16T029761			Undecane, 2-methyl-	7045718	6.00	NGS	8.1	8.1 JNT	_
S16T029761			Undecane, 3-methyl-	1002-43-3	6.05	NGS	7.2	7.2 JNT	_
S16T029761			Undecane, 2,6-dimethyl-	17301-23-4	6.40	NGS .	7.2	7.2 JNT	_
S16T029761		3000	Dodecane, 4,6-dimethyl-	61141728	7.26	NGS	12	12 JNT	_
S16T029761	Ĺ	BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11		_

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

N - Named TIC

J - Estimated

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	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	1#2						
S16T029762			Cyclotrisiloxane, hexamethyl-	541-05-9	2.90	NGS	40	40 JNT
S16T029762			2,2-Dimethyl-3-heptanone	19078-97-8	3.53	NGS	TNL 071	JNT
S16T029762			1-Octen-4-ol	40575-42-6	3.61	NGS	25	54 JNT
S16T029762			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	77	TNL 77
S16T029762			1-Hexanol, 2-ethyl-	104-76-7	4.82	NGS	29	Z9 JNT
S16T029762			D-Limonene	5989-27-5	4.85	NGS	26	26 JNT
S16T029762			Decane, 3,7-dimethyl-	17312-54-8	5.05	NGS	32	32 JNT
S16T029762			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	12	12 JNT
\$167029762			Acetophenone	98-86-2	5.18	NGS	171	TNL 71
S16T029762			Undecane	1120-21-4	5.44	NGS	43	43 JNT
S16T029762		2	Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	51	51 JNT
S16T029762			Benzothiazole	95-16-9	6.59	NGS	25	25 JNT
S16T029762			Dodecane, 4,6-dimethyl-	61141728	7.25	NGS	13	13 JNT
S16T029762		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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	*	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Onit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	#2						
S16T029763			Propanoic acid, 2,2-dimethyl-	75-98-9	3.21	NGS	37	37 JNT
S16T029763			3-Hexanone, 5-methyl-	623-56-3	3.53	NGS	62	62 JNT
S16T029763			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	78	TNL 87
S16T029763			D-Limonene	5989-27-5	4.85	NGS	72	27 JNT
S16T029763			Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	TNC 8.7	JNT
S16T029763			Acetophenone	98-86-2	5.18	NGS	TNL 8.6	JNT
S16T029763			Undecane	1120-21-4	5.44	SDN	28	28 JNT
S16T029763			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	25	57 JNT
S16T029763			Benzothiazole	95-16-9	6.59	NGS	17	TNU 71
S16T029763			Dodecane, 4, 6-dimethyl	61141-72-8	6.89	NGS	13	13 JNT
S16T029763		100	Dodecane, 2,6,11-trimethyl-	31295-56-4	7.25	NGS	11	1 JNT
S16T029763		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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

N - Named TIC

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	nut Duit	Result	Qual Flags
VAPOR-TDU SVOA #2	SVOA	1 #2						
S16T029768			Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	59	TNL 69
S16T029768			Decane, 2,4,6-trimethyl-	62108-27-4	5.05	NGS	16	F JNT
S16T029768			Acetophenone	98-86-2	5.18	NGS	7.8	7.8 JNT
S16T029768			Undecane	1120-21-4	5.44	NGS	32	32 JNT
S16T029768			Decamethlycyclopentasiloxane	541-02-6	5.71	NGS	41	JNT
S16T029768			Benzothiazole	95-16-9	6.60	NGS	39	39 JNT
S16T029768			Dodecane, 2,6,11-trimethyl-	31295-56-4	7.25	NGS	14	14 JNT
S16T029768			Dodecane, 4,6-dimethyl-	61141728	7.40	NGS	5.2 JNT	JNT
S16T029768		BLNK	Chrysene-D12	1719-03-5	14.03	NGS	11	

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

N - Named TIC

J - Estimated

Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162748 SDG Number:

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

oampie# n	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU SVOA #2	SVOA #2												
S16T029751	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	
S16T029751	95-48-7	2-Methylphenol	NGS	86	6.4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a U	
S16T029751	108-39-4M	Cresol (m & p)	NGS	26	<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	e/u	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	
\$167029751	112-40-3	Dodecane	NGS	26	<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	98	<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	

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	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	J SVOA #2											
S16T029752	3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	e/u	n/a	n/a	n/a	3.9	n/a U
S16T029752	95-48-7	2-Methylphenol	NGS	86	<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	16	<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	e/u	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	98	<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	6/0	n/a	n/a	n/a	3.0	n/a []

E - Outside Calibration Range

J - Estimated

U - Less Than Detection Limit

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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	R A# CAS#	**	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2	2												
S16T029753	3891-98-3	-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	n
S16T029753	95-48-7	8-7	2-Methylphenol	NGS	86	6.45	6.43	n/a	n/a	n/a	n/a	4.9	n/a C	2
S16T029753	108-3	108-39-4M	Cresol (m & p)	NGS	26	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a L	
S16T029753	92-52-4	2-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a l	ם
S16T029753	78-46-6	3-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a l	D
S16T029753	84-66-2	5-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a L	ם
S16T029753	112-40-3	10-3	Dodecane	NGS	97	<0.60	06.0	n/a	n/a	n/a	n/a	0.55	n/a	٦
S16T029753	544-76-3	26-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	ח
S16T029753	629-59-4		Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	ם
S16T029753	126-73-8		Tributyl phosphate	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	ם
S16T029753	629-50-5		Tridecane	NGS	96	<1.6	<1,6	n/a	n/a	n/a	n/a	1.6	n/a	ם
S16T029753	629-78-7	7-87	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	2
S16T029753	629-62-9	Ü	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	e/u	3.0	n/a	7

C.62

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	A# CAS#	AS#	Analyte	Unit	% QTS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVO	7#2							3.0					
S16T029754	38	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	ח
S16T029754	95	95-48-7	2-Methylphenol	NGS	86	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	2
S16T029754	10	108-39-4M	Cresol (m & p)	NGS	26	<5.6	<5.6	e/u	n/a	n/a	n/a	5.6	n/a U	ם
S16T029754	92	92-52-4	Biphenyl	NGS	110	<4.0	<4.0	e/u	n/a	n/a	n/a	4.0	Ua U	ם
S16T029754	78	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	u/a U	ם
S16T029754	8	84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	u/a U	ם
S16T029754	1	112-40-3	Dodecane	NGS	26	<0.60	1.3	n/a	n/a	n/a	n/a	0.55	n/a	_
S16T029754	72	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	ם
S16T029754	62	629-59-4	Tetradecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	ם
S16T029754	12	126-73-8	Tributyl phosphate	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	ח
S16T029754	62	629-50-5	Tridecane	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	e/u	ח
S16T029754	62	629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a l	n
S16T029754	62	629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	U/a/U	ח

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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVOA #2												
S16T029764	3891-98-3	3 2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a t	2
S16T029764	95-48-7	2-Methylphenol	NGS	86	6.4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a (0
S16T029764	108-39-4M	M Cresol (m & p)	NGS	26	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	_
S16T029764	92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	5
S16T029764	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	5
S16T029764	84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a l	5
S16T029764	112-40-3	Dodecane	NGS	26	<0.60	88	n/a	n/a	n/a	n/a	0.55	n/a E	ш
S16T029764	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a L	_
S16T029764	629-59-4	Tetradecane	NGS	120	<3.9	15	n/a	n/a	n/a	n/a	3.9	n/a	
S16T029764	126-73-8	Tributyl phosphate	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a L	2
S16T029764	629-50-5	Tridecane	NGS	96	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029764	629-78-7	Heptadecane	NGS	110	<2.4	3.7	n/a	n/a	n/a	n/a	2.4	n/a	_
S16T029764	629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a U	2

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NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary of All Results

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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#	AS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU SVOA #2	SVO	4 #2											
S16T029765	35	3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	8.8	n/a	n/a	n/a	η	3.9	n/a J
S16T029765	6	95-48-7	2-Methylphenol	NGS	86	6.42	<4.9	n/a	n/a	n/a	n/a	4.9	n/a U
S16T029765	Ĕ	108-39-4M	Cresol (m & p)	NGS	26	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029765	6	92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a U
S16T029765	7.8	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	ø	84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a U
S16T029765	1.	112-40-3	Dodecane	NGS	26	<0.60	90	n/a	n/a	n/a	n/a	0.55	n/a
S16T029765	5	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U
S16T029765	9	629-59-4	Tetradecane	NGS	120	<3.9	16	n/a	n/a	n/a	n/a	3.9	n/a
S16T029765	1,	126-73-8	Tributyl phosphate	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U
S16T029765	79	629-50-5	Tridecane	NGS	96	<1.6	22	n/a	n/a	n/a	n/a	1.6	n/a
S16T029765	62	629-78-7	Heptadecane	NGS	110	<2.4	2.5	n/a	n/a	n/a	n/a	2.4	n/a J
S16T029765	9	629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a U

C.65

J - Estimated

E - Outside Calibration Range

U - Less Than Detection Limit E - O

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

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Sample# R		A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	lags
VAPOR-TDU SVOA #2	US/	/OA #2												Γ
S16T029766		3891-98-3	2,6,10-Trimethyldodecane	NGS	110	<3.9	<3.9	e/u	n/a	n/a	n/a	3.9	U/a U	Γ
S16T029766		95-48-7	2-Methylphenol	NGS	86	<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	26	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U	Г
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	Г
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	Ш	112-40-3	Dodecane	NGS	26	<0.60	62	n/a	n/a	n/a	n/a	0.55	n/a E	П
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	Г
S16T029766		126-73-8	Tributyl phosphate	NGS	98	<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	Г
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	Г

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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cot Err % Oual Flags	Sual Flags
VAPOR-TDU SVOA #2	J SVOA #2												
S16T029767	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	
S16T029767	95-48-7	2-Methylphenol	NGS	86	6.45	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	0
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	
S16T029767	92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	
S16T029767	78-46-6	Dibutyl butylphosphonate	NGS	130	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	
S16T029767	84-66-2	Diethylphthalate	NGS	120	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	
S16T029767	112-40-3	Dodecane	NGS	26	<0.60	9.5	n/a	n/a	n/a	n/a	0.55	n/a	
S16T029767	544-76-3	Hexadecane-	NGS	130	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a)
S16T029767	629-59-4	Tetradecane	NGS	120	<3.9	8.6	n/a	n/a	n/a	n/a	3.9	n/a	
S16T029767	126-73-8	Tributyl phosphate	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	1
S16T029767	629-50-5	Tridecane	NGS	96	41.6	4.9	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029767	629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	
S16T029767	629-62-9	Pentadecane	NGS	120	<3.0	3.8	n/a	n/a	n/a	n/a	3.0	n/a	-

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Cartridge Evaluation Data Summary of All Results

Sample Group: 20162746

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Sample# R	A# CAS #	Analyte	Unit	% uzs	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cot Frr % Qual Flags
SOR.	J 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	2-00-62	1,1,2-Trichloroethane	SON	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	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029711	75-35-4	1,1-Dichloroethene	NGS	98	<1.3	c1.3	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029711	107-06-2	1,2-Dichloroethane	NGS	110	<1.6	41.6	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	23	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	e/u	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	63	<1.9	3.6	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029711	110-43-0	2-Heptanone	NGS	26	<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	e/u	1.9	n/a U
S16T029711	78-94-4	3-Buten-2-one	NGS	68	<1.7	2.2	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029711	106-35-4	3-Heptanone	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029711	106-68-3	3-Octanone	NGS	86	<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	26	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029711	67-64-1	Acetone	NGS	88	<4.3	29	n/a	n/a	n/a	n/a	4.3	n/a
S16T029711	75-05-8	Acetonitrile	NGS	16	<1.8	120	n/a	n/a	n/a	n/a	1.8	n/a
S16T029711	98-86-2	Acetophenone	NGS	86	<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	e/u	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
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NA = Not Analyzed, ND = Not Detected E - Outside Calibration Range

J - Estimated

U - Less Than Detection Limit

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

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VAPOR-TDU VOA #2	U VOA #2												
S16T029711	71-43-2	Benzene	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029711	100-47-0	Benzonitrile	SON	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	
S16T029711	123-72-8	Butanal	SON	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a U	
S16T029711	109-74-0	Butanenitrile	NGS	46	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029711	56-23-5	Carbon tetrachloride	SON	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029711	108-90-7	Chlorobenzene	SSN	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029711	75-00-3	Chloroethane	SON	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	
S16T029711	67-66-3	Chloroform	SON	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029711	110-82-7	Cyclohexane	SDN	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	u/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	SDN	110	4.7>	11	n/a	n/a	n/a	n/a	7.4	u/a J	
S16T029711	141-78-6	Ethyl acetate	SON	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029711	100-41-4	Ethylbenzene	SDN	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	U a/u	
S16T029711	110-00-9	Furan	SDN	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	u/a U	
S16T029711	628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	u/a U	
S16T029711	126-98-7	Methacrylonitrile	NGS	66	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	u/a U	
S16T029711	75-09-2	Methylene Chloride	SON	100	<2.7	3.8	e/u	n/a	n/a	n/a	2.7	n/a J	
S16T029711	91-20-3	Naphthalene	NGS	26	<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	Pentanenitrile	NGS	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029711	107-12-0	Propanenitrile	NGS	96	4.1.4	4.12	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	Г
S16T029711	108-88-3	Toluene	NGS	86	<1.5	2.5	n/a	n/a	n/a	n/a	1.5	u/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	Γ
S16T029711	75-69-4	Trichlorofluoromethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	

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

Y - Comment a - LCS Outside Range

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U - Less Than Detection Limit

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate		RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDI	J 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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029711	142-82-5	n-Heptane	NGS	96	4.1>	4.1>	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

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

J - Estimated

U - Less Than Detection Limit

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	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	66	<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
S16T029712	108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	e/u	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
S16T029712	110-43-0	2-Heptanone	NGS	26	<1.6	29	n/a	n/a	n/a	n/a	1.6	n/a
S16T029712	591-78-6	2-Hexanone	NGS	96	<1.2	8.5	e/u	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	88	<1.7	2.3	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029712	106-35-4	3-Heptanone	NGS	26	<1.5	170	n/a	n/a	n/a	n/a	1.5	n/a
S16T029712	106-68-3	3-Octanone	NGS	86	<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	26	<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	09	n/a	n/a	n/a	n/a	4.3	n/a
S16T029712	75-05-8	Acetonitrile	NGS	91	<1.8	160	n/a	n/a	n/a	n/a	1.8	n/a
S16T029712	98-86-2	Acetophenone	NGS	86	<2.6	5.1	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029712	107-13-1	Acrylonitrile	NGS	85	<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	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U

J - Estimated

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

U - Less Than Detection Limit

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	VOA #2											
S16T029712	71-43-2	Benzene	NGS	86	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029712	100-47-0	Benzonitrile	NGS	66	<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	86	<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	4.7>	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	66	<1.6	7.2	n/a	n/a	n/a	n/a	1.6	n/a J
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	6	<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	Pentanenitrile	NGS	16	<1.6	2.2	e/u	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	86	<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

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

Sample# R	₩	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average R	RPD % S	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Nual Flags
VAPOR-TDU VOA #2	DO VO	A #2												
S16T029712	L	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 L	_
S16T029712		123-86-4	n-Butyl acetate	NGS	82	4.1.4	4.1>	n/a	n/a	n/a	n/a	1.4	n/a L	_
S16T029712		142-82-5	n-Heptane	NGS	96	<1.4	4.8	n/a	n/a	n/a	n/a	1.4	n/a	مدو
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 l	_

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

J - Estimated

U - Less Than Detection Limit

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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	A# CAS#	Analyte	Ouit	2010		10001		00000		200000000000000000000000000000000000000	1	1	Det Limit ont Err 76 Qual Flags
VAPOR-TDU VOA #2	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	2-00-62	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	66	<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	92	<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	e/u	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	
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	26	<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	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	
S16T029713	106-35-4	3-Heptanone	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029713	106-68-3	3-Octanone	NGS	86	<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	26	<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	
S16T029713	75-05-8	Acetonitrile	NGS	91	<1.8	200	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029713	98-86-2	Acetophenone	NGS	86	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U	
S16T029713	107-13-1	Acrylonitrile	NGS	85	<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	001		2000								

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

U - Less Than Detection Limit

J - Estimated

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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	A# CAS#	Analyte	Unit	% OTS	Blank	Result	Duplicate	Average	$\overline{}$	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T029713	71-43-2	Benzene	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029713	100-47-0	Benzonitrile	NGS	66	<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	e/u	n/a	e/u	2.1	n/a U
S16T029713	109-74-0	Butanenitrile	NGS	26	<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	108-801	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1,5	n/a U
S16T029713	2-00-57	Chloroethane	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029713	67-66-3	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	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029713	64-17-5	Ethanol	NGS	110	4.7>	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	66	<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	2.7	n/a J
S16T029713	91-20-3	Naphthalene	NGS	26	<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	Pentanenitrile	NGS	26	<1.6	<1.6	e/u	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	e/u	n/a	n/a	n/a	1.6	n/a U
S16T029713	108-88-3	Toluene	NGS	86	<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	41.6	<1.6	e/u	n/a	n/a	n/a	1.6	n/a U

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

U - Less Than Detection Limit

J - Estimated

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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	₹ ~	# CAS#	Analyte	Unit	% Q1S	Blank	Result	Result Duplicate	Average		RPD % Spk Rec %	Dot Limit Cnt Err % Qual Flags	r % Qual Flags
VAPOR-TE	TDU V	OA #2											
S16T029713	-	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	e/u	n/a	n/a	n/a	1.3	n/a U
S16T029713	-	123-86-4	n-Butyl acetate	NGS	82	4.12	4.12	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029713		142-82-5	n-Heptane	NGS	96	4.12	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

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

Y - Comment a - LCS Outside Range

U - Less Than Detection Limit

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

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VAPOR-TDU VOA #2	I 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	66	<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	98	<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	Γ
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	- 17
S16T029714	71-23-8	1-Propanol	NGS	120	<3.0	75	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029714	108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	e/u	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	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029714	591-78-6	2-Hexanone	NGS	38	<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	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	
S16T029714	106-35-4	3-Heptanone	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029714	106-68-3	3-Octanone	NGS	86	<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	26	<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	
S16T029714	75-05-8	Acetonitrile	NGS	91	<1.8	140	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029714	98-86-2	Acetophenone	NGS	86	<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	U e/u	
S16T029714	107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	u/a U	

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

J - Estimated

C.77

Y - Comment a - LCS Outside Range

U - Less Than Detection Limit

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

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VAPOR-TDU VOA #2	J VOA #2								-			
S16T029714	71-43-2	Benzene	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029714	100-47-0	Benzonitrile	NGS	66	<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	46	<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	86	<1.9	<1.9	n/a	n/a	n/a	e/u	1.9	n/a U
S16T029714	67-66-3	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	64-17-5	Ethanol	NGS	110	4.7>	4.7>	n/a	n/a	n/a	n/a	7.4	n/a U
S16T029714	141-78-6	Ethyl acetate	SON	82	<1.5	<1.5	e/u	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	e/u	n/a	n/a	n/a	1.7	n/a U
S16T029714	628-73-9	Hexanenitrile	NGS	100	<1.5	<1.5	e/u	n/a	n/a	n/a	1.5	n/a U
S16T029714	126-98-7	Methacrylonitrile	NGS	66	<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	26	<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	Pentanenitrile	NGS	26	<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	86	<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	e/u	n/a	n/a	n/a	1.6	n/a U

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

Cample# D	44	7000	Amplido	11-11		Disale	Daniel II	Burnillands.	A	1000	10 . 0	11.11.11	0
Samples	ŧ	CAS#	Midigie	1115	STD%	Didna	Result	Result Duplicate	Average	KPD %	Werage RFD % Spk Kec %	Det Limit	Det Limit Cut Err % Qual Flags
VAPOR-TDU VOA #2	DO VC	DA #2											
S16T029714	L	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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029714		142-82-5	n-Heptane	NGS	96	4.1>	4,1>	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

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

VAPOR-TDU VOA #2 S16T029724 79-00- S16T029724 75-34-4 S16T029724 75-34-4 S16T029724 75-35-4								144 Charles Company (144 Charles Company)			5 0 7 - 0 7 - 0 5 5 5 5	The state of the s	The state of the s
	#2												
	79-34-5	1,1,2,2-Tetrachloroethane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	2
	2-00-62	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	n
	75-34-3	1,1-Dichloroethane	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	2
	75-35-4	1,1-Dichloroethene	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	D
	107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	e/u	n/a	n/a	1.6	n/a U	2
\$16T029724 54	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	ם
S16T029724 10	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	ח
S16T029724 12	123-91-1	1,4-Dioxane	NGS	100	<1.7	3.9	n/a	n/a	n/a	n/a	1.7	n/a	7
\$16T029724 71	71-36-3	1-Butanol	NGS	140	<8.9	640	n/a	n/a	n/a	n/a	8.9	n/a Ya	Ya
\$167029724	111-70-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n
S16T029724 71	71-23-8	1-Propanol	NGS	120	<3.0	430	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029724 10	108-47-4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	ס
S16T029724 17	1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	ם
\$16T029724 78	78-93-3	2-Butanone	NGS	93	<1.9	510	n/a	n/a	n/a	n/a	1.9	n/a	ш
	110-43-0	2-Heptanone	NGS	26	<1.6	89	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029724 59	591-78-6	2-Hexanone	NGS	98	<1.2	48	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029724 53	534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a L	0
S16T029724 78	78-94-4	3-Buten-2-one	NGS	88	<1.7	37	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029724 10	106-35-4	3-Heptanone	NGS	26	<1.5	410	n/a	n/a	n/a	n/a	1.5	n/a E	Е
S16T029724 10	106-68-3	3-Octanone	NGS	86	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	ם
S16T029724 10	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	0
S16T029724 10	108-10-1	4-Methyl-2-Pentanone	NGS	26	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	-
S16T029724 67.	67-64-1	Acetone	NGS	88	<4.3	6.3E+03	n/a	n/a	n/a	n/a	4.3	n/a EY	EY
\$16T029724 75	75-05-8	Acetonitrile	NGS	91	<1.8	096	n/a	n/a	n/a	n/a	1.8	n/a	ш
S16T029724 98	98-86-2	Acetophenone	NGS	86	<2.6	27	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029724 10	107-13-1	Acrylonitrile	NGS	85	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a L	5
	107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	2
S16T029724 10	107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	e/u	n/a	2.8	n/a U	5

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

Y - Comment a - LCS Outside Range

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U - Less Than Detection Limit

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

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 VOA #2											
S16T029724	71-43-2	Benzene	NGS	86	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029724	100-47-0	Benzonitrile	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029724	123-72-8	Butanal	NGS	110	42.1	47	n/a	n/a	n/a	n/a	2.1	n/a
S16T029724	109-74-0	Butanenitrile	NGS	26	<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	86	<1.9	9.9	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029724	67-66-3	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	<7.4	540	n/a	n/a	n/a	n/a	7.4	n/a
S16T029724	141-78-6	Ethyl acetate	SON	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	e/u	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	66	<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	26	<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	Pentanenitrile	NGS	26	<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	86	<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

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

J - Estimated

U - Less Than Detection Limit

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Cartridge Evaluation Data Summary of All Results

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

Sample#	R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDL	-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	2
S16T029724		123-86-4	n-Butyl acetate	NGS	82	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a	ם
S16T029724		142-82-5	n-Heptane	NGS	96	4.1>	19	e/u	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	2

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	A# CAS#	Analyte	Unit	% Q1S	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	I 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	Ua U	
S16T029725	75-34-3	1,1-Dichloroethane	NGS	66	<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	98	<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	(a
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	
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	220	n/a	n/a	n/a	n/a	1.9	n/a E	
S16T029725	110-43-0	2-Heptanone	NGS	26	<1.6	2/2	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029725	591-78-6	2-Hexanone	NGS	98	<1.2	31	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029725	534-22-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029725	78-94-4	3-Buten-2-one	NGS	88	<1.7	35	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029725	106-35-4	3-Heptanone	NGS	26	<1.5	420	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029725	106-68-3	3-Octanone	NGS	86	<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 t	
S16T029725	108-10-1	4-Methyl-2-Pentanone	NGS	26	<1.9	6.4	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029725	67-64-1	Acetone	NGS	88	<4.3	7.1E+03	n/a	n/a	n/a	n/a	4.3	n/a EY	<u></u>
S16T029725	75-05-8	Acetonitrile	NGS	91	<1.8	1.0E+03	n/a	n/a	n/a	n/a	1.8	n/a	ш
S16T029725	98-86-2	Acetophenone	NGS	86	<2.6	53	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029725	107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a (
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	102-02-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	

J - Estimated

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E - Outside Calibration Range

U - Less Than Detection Limit

Y - Comment a - LCS Outside Range

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Cartridge Evaluation Data Summary of All Results

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

Sample# R A# CAS VAPOR-TDU VOA #2 \$16T029725 71-4; \$16T029725 100- \$16T029725 100- \$16T029725 123- \$16T029725 109- \$16T029725 \$16T029725 \$16T029725 \$16T029725	A# CAS# J VOA #2	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VO S16T029725 S16T029725 S16T029725 S16T029725 S16T029725 S16T029725 S16T029725 S16T029725	A #2						Committee of the Commit					
\$16T029725 \$16T029725 \$16T029725 \$16T029725 \$16T029725 \$16T029725												
\$16T029725 \$16T029725 \$16T029725 \$16T029725 \$16T029725	71-43-2	Benzene	NGS	86	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a J
\$16T029725 \$16T029725 \$16T029725 \$16T029725	100-47-0	Benzonitrile	NGS	66	41.9	41.9	n/a	n/a	n/a	n/a	1.9	n/a U
\$16T029725 \$16T029725 \$16T029725	123-72-8	Butanal	NGS	110	<2.1	39	n/a	n/a	n/a	n/a	2.1	n/a
S16T029725 S16T029725	109-74-0	Butanenitrile	NGS	16	<1.2	99	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
	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	e/u	1.5	n/a U
S16T029725	25-00-3	Chloroethane	NGS	86	<1.9	8.9	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029725	67-66-3	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	8	<2.8	18	n/a	n/a	n/a	n/a	2.8	n/a
S16T029725	64-17-5	Ethanol	NGS	110	4.7>	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	66	<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	46	<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	26	>1.6	18	n/a	n/a	n/a	n/a	1.6	n/a
S16T029725	107-12-0	Propanenitrile	NGS	96	4.1>	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	86	<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

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

U - Less Than Detection Limit

J - Estimated

Y - Comment a - LCS Outside 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-IN-C
Customer Sample ID: 16-08068-2-IN-C

Sample#	R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %		Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR	APOR-TDU VOA	VOA #2									1			
S16T029725	L	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	1
S16T029725		123-86-4	n-Butyl acetate	NGS	82	4.1>	4.1>	e/u	n/a	n/a	n/a	1.4	n/a U	
S16T029725		142-82-5	n-Heptane	NGS	96	4.1>	12	n/a	n/a	n/a	n/a	1.1	n/a	
S16T029725	VES	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	

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

Y - Comment a - LCS Outside Range

U - Less Than Detection Limit

Sample Group: 20162746

Cartridge Evaluation Data Summary of All Results

Committee of the Commit											The state of the s			
Sample# R	A# CAS#		Analyto	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	J VOA #2													
S16T029726	79-34-5	2	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	2-00-62	5	1,1,2-Trichloroethane	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	_
S16T029726	75-34-3	8	1,1-Dichloroethane	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	_
S16T029726	75-35-4	4	1,1-Dichloroethene	NGS	95	c.1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	_
S16T029726	107-06-2	3-5	1,2-Dichloroethane	NGS	110	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	_
S16T029726	542-75-6	9-6	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	1-1	1,4-Dichlorobenzene	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	_
S16T029726	123-91-1	-1	1,4-Dioxane	NGS	100	<1.7	3.5	n/a	n/a	n/a	n/a	1.7	n/a	اندواد
S16T029726	71-36-3	3	1-Butanol	NGS	140	<8.9	920	n/a	n/a	n/a	n/a	8.9	n/a Ya	,a
S16T029726	111-70-6	.9-6	1-Heptanol	NGS	100	<5.6	<5.6	n/a	e/u	n/a	n/a	5.6	n/a U	
S16T029726	71-23-8	8	1-Propanol	NGS	120	<3.0	380	n/a	n/a	n/a	n/a	3.0	n/a	
S16T029726	108-47-4	4	2,4-Dimethylpyridine	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	_
S16T029726	1708-29-8	8-6	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	_
S16T029726	78-93-3	3	2-Butanone	NGS	83	<1.9	400	n/a	n/a	n/a	n/a	1.9	n/a	p.r
S16T029726	110-43-0	9-0	2-Heptanone	NGS	26	<1.6	43	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029726	591-78-6	9-9	2-Hexanone	NGS	98	<1.2	42	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029726	534-22-5	5-5	2-Methylfuran	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	_
S16T029726	78-94-4	4	3-Buten-2-one	NGS	68	<1.7	30	n/a	n/a	n/a	n/a	1.7	n/a	
S16T029726	106-35-4	4-4	3-Heptanone	NGS	46	<1.5	260	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029726	106-68-3	1-3	3-Octanone	NGS	86	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	_
S16T029726	105-42-0	9	4-Methyl-2-hexanone	NGS	96	<1.3	<1.3	e/u	n/a	n/a	n/a	1.3	n/a U	_
S16T029726	108-10-1	1-1	4-Methyl-2-Pentanone	NGS	26	<1.9	2.7	n/a	n/a	n/a	n/a	1.9	n/a	120
S16T029726	67-64-1	1	Acetone	NGS	88	<4.3	5.9E+03	n/a	n/a	n/a	n/a	4.3	n/a EY	<u></u>
S16T029726	75-05-8	8	Acetonitrile	NGS	91	<1.8	970	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029726	98-86-2	2	Acetophenone	NGS	86	<2.6	19	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029726	107-13-1	1-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a [_
S16T029726	107-18-6		Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	_
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NA = Not Analyzed, ND = Not Detected E - Outside Calibration Range

U - Less Than Detection Limit

Sample Group: 20162746

Cartridge Evaluation Data Summary of All Results

Customer Sample													
Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2												
S16T029726	71-43-2	Benzene	NGS	86	<1.2	9.1	n/a	n/a	n/a	n/a	1.2	n/a	2
S16T029726	100-47-0	Benzonitrile	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	D
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	6	<1.2	42	n/a	n/a	n/a	n/a	1.2	n/a	
S16T029726	56-23-5	Carbon tetrachloride	NGS	110	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n
S16T029726	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	2
S16T029726	75-00-3	Chloroethane	NGS	86	<1.9	5.9	n/a	n/a	n/a	n/a	1.9	n/a	-
S16T029726	67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	2
S16T029726	110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1,8	n/a	ח
S16T029726	124-18-5	Decane	NGS	94	<2.8	9.5	n/a	n/a	n/a	n/a	2.8	n/a	7
S16T029726	64-17-5	Ethanol	NGS	110	4.7>	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	ם
S16T029726	100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		ח
S16T029726	110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	ח
S16T029726	110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a L	n
S16T029726	628-73-9	Hexanenitrile	NGS	100	<1.5	5.6	n/a	n/a	n/a	n/a	1.5	n/a	7
S16T029726	126-98-7	Methacrylonitrile	NGS	66	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	_
S16T029726	75-09-2	Methylene Chloride	NGS	100	<2.7	3.2	n/a	n/a	n/a	n/a	2.7	n/a	_
S16T029726	91-20-3	Naphthalene	NGS	6	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a U	ם
S16T029726	98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a L	ח
S16T029726	110-59-8	Pentanenitrile	NGS	26	<1.6	14	n/a	n/a	n/a	n/a	1.6		
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	7
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	7
S16T029726	79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n
S16T029726	75-69-4	Trichlorofluoromethane	NGS	100	<1.6	130	n/a	n/a	n/a	n/a	4	cju	

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

Y - Comment a - LCS Outside 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-IN-D Customer Sample ID: 16-08068-2-IN-D

Sample# R	₹	CAS#	Analyte	Unit	% QTS	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	pk Rec %	Det Limit Cnt Err % Qual Flags	Cnt Err %	Qual Flags
VAPOR-TD	N Na	OA #2												-
S16T029726	H	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	2
\$167029726	-	123-86-4	n-Butyl acetate	NGS	82	4.1>	4.1.4	n/a	n/a	n/a	n/a	1.4	n/a	2
S16T029726	_	142-82-5	n-Heptane	NGS	96	4.1>	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	5

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

J - Estimated

U - Less Than Detection Limit

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	Cuit	STD %	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2			1000								
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	2-00-62	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	66	<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	41.6	<1.6	n/a	n/a	n/a	e/u	1.6	n/a U
S16T029727	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
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	260	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-Propanoi	NGS	120	<3.0	340	n/a	n/a	n/a	n/a	3.0	n/a
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	83	<1.9	300	n/a	n/a	n/a	n/a	1.9	n/a
S16T029727	110-43-0	2-Heptanone	NGS	26	<1.6	41	n/a	n/a	n/a	n/a	1.6	n/a
S16T029727	591-78-6	2-Hexanone	NGS	98	<1.2	30	n/a	n/a	n/a	n/a	1.2	n/a
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	88	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a
S16T029727	106-35-4	3-Heptanone	NGS	26	<1.5	260	n/a	n/a	n/a	n/a	1.5	n/a
S16T029727	106-68-3	3-Octanone	NGS	86	<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	26	<1.9	2.9	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029727	67-64-1	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	86	<2.6	21	n/a	n/a	n/a	n/a	2.6	n/a
S16T029727	107-13-1	Acrylonitrile	NGS	92	<1.7	41.7	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	0/a []

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

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary of All Results

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

Sample# R													
	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	I VOA #2												
S16T029727	71-43-2	Benzene	NGS	86	<1.2	8.8	n/a	n/a	n/a	n/a	1.2	n/a J	
S16T029727	100-47-0	Benzonitrile	NGS	66	41.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	5
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	_
S16T029727	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	2
S16T029727	75-00-3	Chloroethane	NGS	86	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	_
S16T029727	67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	2
S16T029727	110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	2
S16T029727	124-18-5	Decane	NGS	94	<2.8	6.9	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029727	64-17-5	Ethanol	NGS	110	4.7>	200	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029727	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	e/u	n/a	n/a	n/a	1.5	n/a	_
S16T029727	100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	2
\$167029727	110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	2
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	
S16T029727	126-98-7	Methacrylonitrile	NGS	66	41.6	<1.6	n/a	n/a		n/a	1.6	n/a [
S16T029727	75-09-2	Methylene Chloride	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	_
S16T029727	91-20-3	Naphthalene	NGS	97	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	5
S16T029727	98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029727	110-59-8	Pentanenitrile	NGS	46	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029727	107-12-0	Propanenitrile	NGS	96	<1.4	65	e/u	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,	
S16T029727	100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	
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	86	<1.5	6.7	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029727	9-10-62	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	5
S16T029727	75-69-4	Trichlorofluoromethane	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a	

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

Y - Comment a - LCS Outside Range

C.90

U - Less Than Detection Limit

J - Estimated

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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	₹	CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD % Spk Rec %	k Rec %	Det Limit C	Det Limit Cnt Err % Qual Flags
VAPOR-TDU	N na	U VOA #2											
S16T029727	H	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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029727	H	142-82-5	n-Heptane	NGS	96	4.1>	12	n/a	n/a	n/a	n/a	4.1	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

NA = Not Analyzed, ND = Not Detected

E - Outside Calibration Range

J - Estimated

U - Less Than Detection Limit

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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	66	<1.2	<1.2	u/a	n/a	n/a	n/a	1.2	n/a U
S16T029728	75-35-4	1,1-Dichloroethene	NGS	98	<1.3	<1.3	n/a	nła	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	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029728	106-46-7	1,4-Dichlorobenzene	SDN	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
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
S16T029728	110-43-0	2-Heptanone	NGS	26	<1.6	36	n/a	n/a	n/a	n/a	1.6	n/a
S16T029728	591-78-6	2-Hexanone	NGS	98	<1.2	26	n/a	n/a	n/a	n/a	1.2	n/a
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	88	<1.7	12	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029728	106-35-4	3-Heptanone	NGS	26	<1.5	220	n/a	n/a	n/a	n/a	1.5	n/a
S16T029728	106-68-3	3-Octanone	NGS	86	<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	86	<2.6	14	n/a	n/a	n/a	n/a	2.6	n/a
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	88	<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

U - Less Than Detection Limit

Y - Comment a - LCS Outside Range

C.92

J - Estimated

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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	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T029728	71-43-2	Benzene	NGS	86	<1.2	7.0	n/a	n/a	n/a	n/a	1.2	n/a	7
S16T029728	100-47-0	Benzonitrile	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	ח
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	26	<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	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n
S16T029728	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n
S16T029728	22-00-3	Chloroethane	NGS	86	<1.9	7.6	n/a	n/a	n/a	n/a	1.9	n/a	_
S16T029728	67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	D
S16T029728	110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	n
S16T029728	124-18-5	Decane	NGS	94	<2.8	5.4	n/a	n/a	n/a	n/a	2.8	n/a	7
S16T029728	64-17-5	Ethanol	NGS	110	4.7>	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	D
S16T029728	100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	ם
S16T029728	110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ח
S16T029728	110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	2
S16T029728	628-73-9	Hexanenitrile	NGS	100	<1,5	2.6	n/a	n/a	n/a	n/a	1.5	n/a J	7
S16T029728	126-98-7	Methacrylonitrile	NGS	66	<1,6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ם
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	ם
S16T029728	91-20-3	Naphthalene	NGS	6	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a U	n
S16T029728	98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U	ח
S16T029728	110-59-8	Pentanenitrile	NGS	46	<1.6	8.5	n/a	n/a	n/a	n/a	1.6	n/a	7
S16T029728	107-12-0	Propanenitrile	NGS	96	<1.4	20	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	7
S16T029728	100-42-5	Styrene	NGS	100	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	5
S16T029728	127-18-4	Tetrachloroethene	NGS	110	<1.6	8.8	n/a	n/a	n/a	n/a	1.6	n/a	7
S16T029728	108-88-3	Toluene	NGS	86	<1.5	5.1	n/a	n/a	n/a	n/a	1.5	n/a	7
S16T029728	79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	ם
S16T029728	75-69-4	Trichlorofluoromethane	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	

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

J - Estimated

U - Less Than Detection Limit

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

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Sample#	8	A# CAS#	Analyte	Unit	% QTS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	TDU	OA #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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029728		142-82-5	n-Heptane	NGS	96	4.1>	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

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

J - Estimated

U - Less Than Detection Limit

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	A# CAS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	66	<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	98	<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	41.9	300	n/a	n/a	n/a	n/a	1.9	n/a
S16T029729	110-43-0	2-Heptanone	NGS	26	<1.6	28	n/a	n/a	n/a	n/a	1.6	n/a
S16T029729	591-78-6	2-Hexanone	NGS	98	<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	88	<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	86	<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	46	<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	98-86-2	Acetophenone	NGS	86	<2.6	11	e/u	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	u/a	n/a	n/a	n/a	3.9	n/a U
S16T029729	107-05-1	Allyl Chloride	NGS	88	<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

imit

U - Less Than Detection Limit

le 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	A# CAS#	Analyte	Unit	% QTS	Blank	Result	Duplicate	Average		RPD % Sok Rec %	Det Limit	Cnt Frr % Qual Flags
VAPOR-TDU VOA #2	U VOA #2		-		000000							
S16T029729	71-43-2	Benzene	NGS	86	<1.2	6.8	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029729	100-47-0	Benzonitrile	NGS	66	<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	86	<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	4.7>	320	n/a	n/a	e/u	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	96	<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	628-73-9	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	66	<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	4.1.4	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	86	<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	41.6	66	n/a	n/a	n/a	n/a	1.6	n/a

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

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary of All Results

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

Sample Group: 20162746

	I												
Sample# R	¥ ₩	A# CAS#	Analyte	Unit	% dTS	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	pk Rec %	Det Limit C	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	TDU VC	24 #2											
S16T029729	H	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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029729		142-82-5	n-Heptane	NGS	96	4.1.4	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

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

J - Estimated

U - Less Than Detection Limit

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Day Cartridge Evaluation

| O | 1 | | Data Summary Report

	37-2-BASE-EFF 7837-2-BASE-EFF
20162744	Customer Sample ID: 16-07837-2-BASE-EFF Customer Sample ID: 16-07837-2-BASE-EFF
Sample Group: 20162744 SDG Number:	Customer S Customer

Sample# K	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Flags
VAPOR-TDU VOA #2	U 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	1.3	n/a U	Γ
S16T029691	2-00-62	1,1,2-Trichloroethane	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	Г
S16T029691	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029691	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	e/u	n/a	n/a	n/a	1.3	n/a U	Γ
S16T029691	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	
S16T029691	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<1.2	<1,2	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	2.0	Ua U	
S16T029691	123-91-1	1,4-Dioxane	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	u/a U	
S16T029691	71-36-3	1-Butanol	NGS	120	<8.9	26	n/a	n/a	n/a	n/a	8.9	n/a Y	
S16T029691	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	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	e/u	e/u	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	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	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	1.9	n/a J	
S16T029691	110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	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	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	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	1.7	n/a J	
S16T029691	106-35-4	3-Heptanone	NGS	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029691	106-68-3	3-Octanone	NGS	98	<2.4	<2.4	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	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	1.9	n/a U	Г
S16T029691	67-64-1	Acetone	NGS	88	<4.3	36	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029691	75-05-8	Acetonitrile	NGS	06	<1.8	15	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	2.6	n/a J	
S16T029691	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	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	3.9	n/a U	

Q - Qualitative B - Blank Contamination N - Named TIC

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

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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# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	86	<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	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	1.5	n/a U
S16T029691	75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029691	67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a		n/a	1.5	n/a U
S16T029691	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	e/u	n/a	n/a	n/a	1.8	n/a U
S16T029691	124-18-5	Decane	NGS	98	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a
S16T029691	64-17-5	Ethanol	NGS	66	4.7>	15	n/a	n/a	n/a	n/a	7.4	n/a J
S16T029691	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029691	100-41-4	Ethylbenzene	NGS	66	<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	26	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029691	628-73-9	Hexanenitrile	NGS	96	<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	98-95-3	Nitrobenzene	NGS	16	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029691	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029691	107-12-0	Propanenitrile	NGS	86	<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	e/u	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	1.6	n/a
S16T029691	108-88-3	Toluene	NGS	96	<1.5	3.8	n/a	n/a	n/a	n/a	4	l'e/u

N - Named TIC Q - Qualitative B - Blank Contamination

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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

J - Estimated E - Outside Calibration Range

J - Estima

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

ample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU VOA #2	J VOA #2												١
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	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029691	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	
S16T029691	123-86-4	n-Butyl acetate	NGS	94	4.1>	1.8	n/a	n/a	n/a	n/a	1.4	n/a J	
161029691	142-82-5	n-Heptane	NGS	96	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U	
S16T029691	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	

NA = Not Analyzed, ND = Not Detected

Y - Comment U - Less Than Detection Limit

J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

N - Named TIC Q - Qualitative B - Blank Contamination

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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	Det Limit Cnt Err % Qual Flags	I Flags
VAPOR-TDU VOA #2	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	2-00-62	1,1,2-Trichloroethane	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029692	75-34-3	1,1-Dichloroethane	SON	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029692	75-35-4	1,1-Dichloroethene	NGS	66	<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	l
S16T029692	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	86	<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	98	<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	U s/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	85	<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	L e/u	
S16T029692	106-68-3	3-Octanone	NGS	98	<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	
S16T029692	67-64-1	Acetone	NGS	88	<4.3	80	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029692	75-05-8	Acetonitrile	NGS	06	<1.8	23	n/a	n/a	n/a	n/a	1.8	n/a	
S16T029692	98-86-2	Acetophenone	NGS	96	<2.6	5.4	n/a	n/a	n/a	n/a	2.6	L/a/J	
S16T029692	107-13-1	Acrylonitrile	NGS	86	<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	<3.0	430	oju	ata	oto	a fa	00		

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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	26	<1.2	7.0	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029692	100-47-0	Benzonitrile	NGS	86	41.9	<1.9	n/a	n/a	n/a	n/a	1.9	
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	
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		1.5	
S16T029692	75-00-3	Chloroethane	NGS	95	41.9	<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	
S16T029692	110-82-7	Cyclohexane	NGS	66	<1.8	4.6	n/a	n/a	n/a	n/a	1.8	n/a J
S16T029692	124-18-5	Decane	NGS	98	<2.8	10	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029692	64-17-5	Ethanol	NGS	66	4.7>	73	n/a	n/a	n/a	n/a	7.4	n/a
S16T029692	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029692	100-41-4	Ethylbenzene	NGS	66	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a J
S16T029692	110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029692	110-54-3	Hexane	NGS	26	<1.7	11	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029692	628-73-9	Hexanenitrile	NGS	96	<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	86	<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	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029692	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029692	107-12-0	Propanenitrile	NGS	86	<1.4	4.1>	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	72	n/a	n/a	n/a	n/a	1.5	n/a

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

N - Named TIC Q - Qualitative B - Blank Contamination

C.102

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	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	ON NO	A #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	86	<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	98	4.1.4	2.4	n/a	n/a	n/a	e/u	1.4	n/a J
S16T029692		142-82-5	n-Heptane	NGS	96	4.1×	<1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029692		10061-02-6	trans.1 3-Dichloronopone	SON	00	<12	410	n/u	0/4	ala	200	,	11 17 1

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

C.103

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Cartridge Evaluation Data Summary Report

Customer Sample ID: 16-07837-2-BLANK1 Customer Sample ID: 16-07837-2-BLANK1 SDG Number:

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	U 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	2-00-62	1,1,2-Trichloroethane	NGS	26	<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	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029693	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	
S16T029693	107-06-2	1,2-Dichloroethane	NGS	100	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029693	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	l
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	98	<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	U/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	ľ
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	98	<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	U/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	88	<4.3	9.9	n/a	n/a	n/a	n/a	4.3	n/a J	
S16T029693	75-05-8	Acetonitrile	NGS	06	<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	86	<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	3.0	Helm	

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-BLANK1 Customer Sample ID: 16-07837-2-BLANK1

Sample# R	A# CAS#	Analyte	Unit	% QTS	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U 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	26	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029693	100-47-0	Benzonitrile	NGS	86	<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	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029693	67-66-3	Chloroform	NGS	100	<1.5	<1.5		n/a	n/a	n/a	1.5	n/a U
S16T029693	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029693	124-18-5	Decane	NGS	96	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029693	64-17-5	Ethanol	NGS	66	4.7>	7.8	n/a	n/a	n/a	n/a	7.4	n/a J
S16T029693	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029693	100-41-4	Ethylbenzene	NGS	66	<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	628-73-9	Hexanenitrile	SSN	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	SSN	86	<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	87	<2.6	<2.6	n/a	n/a	e/u	n/a	2.6	U e/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	88	<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	e/u	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
										i		

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-BLANK1 Customer Sample ID: 16-07837-2-BLANK1

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD % Spk Rec %		Det Limit Cnt Err % Qual Flags
VAPOR-TDU	U 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	86	<1.6	<1.6	n/a	n/a	n/a n/a		
S16T029693	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	ח/א	-	
S16T029693	123-86-4	n-Butyl acetate	NGS	98	41.4	41.4	n/a	n/a			
S16T029693	142-82-5	n-Heptane	NGS	96	4.1>	4.1>	n/a	n/a			
S16T029693	10061-02-6	trans-1.3-Dichloropropene	NGS	56	<12	512	n/a	ola.	nto ato	,	

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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	ti C	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	1.3	n/a[U
S16T029694	79-00-5	1,1,2-Trichloroethane	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029694	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029694	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	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	1.6	n/a U
S16T029694	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<1.2	<1.2	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	2.0	n/a U
S16T029694	123-91-1	1,4-Dioxane	NGS	86	<1.7	<1.7	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	8.9	n/a UY
S16T029694	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	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	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	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	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	1.9	n/a U
S16T029694	110-43-0	2-Heptanone	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029694	591-78-6	2-Hexanone	NGS	85	<1.2	<1.2	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	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	1.7	n/a U
S16T029694	106-35-4	3-Heptanone	NGS	35	<1.5	<1,5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029694	106-68-3	3-Octanone	NGS	98	<2.4	<2.4	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	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	1.9	n/a U
S16T029694	67-64-1	Acetone	NGS	88	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a U
S16T029694	75-05-8	Acetonitrile	NGS	06	<1.8	14	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	2.6	n/a U
S16T029694	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029694	107-18-6	Allyl Alcohol	NGO	440	000	000		-				

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

N - Named TIC Q - Qualitative B - Blank Contamination

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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	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err %	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	26	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	2
S16T029694	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T029694	123-72-8	Butanal	SON	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	Ua/u	2
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	2
S16T029694	75-00-3	Chloroethane	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	2
S16T029694	67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	ם
S16T029694	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U	2
S16T029694	124-18-5	Decane	NGS	95	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U	2
S16T029694	64-17-5	Ethanol	NGS	66	4.7>	4.7>	n/a	n/a	n/a	n/a	7.4	n/a U	2
S16T029694	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	2
S16T029694	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	D
S16T029694	110-00-9	Furan	NGS	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	U/a U	D
S16T029694	110-54-3	Hexane	NGS	97	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	ם
S16T029694	628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	U/a U	2
S16T029694	126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ם
S16T029694	75-09-2	Methylene Chloride	NGS	86	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	U/a U	ם
S16T029694	91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	Ua U	ם
S16T029694	98-95-3	Nitrobenzene	NGS	97	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	U/a U	2
S16T029694	110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ם
S16T029694	107-12-0	Propanenitrile	NGS	86	4.1>	<1.4	e/u	n/a	n/a	n/a	1.4	n/a	2
S16T029694	110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a U	D
S16T029694	100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ח
S16T029694	127-18-4	Tetrachloroethene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	n
S16T029694	108-88-3	Toluene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	11000	=

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

N - Named TIC Q - Qualitative B - Blank Contamination

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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	OTT 0/	Blank	Bosnitt	Roseuth Dunilicate	Average		DDD % Calc Dag %	Dat I imit	0 00
	-				2010	-	-	andina	Serios		סל אמר אלכ	TO THE PARTY OF	Det Limit on Err 76 Wull Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T029694	79-01-6	ဖှ	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029694	75-69-4	4	Trichlorofluoromethane	NGS	86	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029694	10061	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	6-4	n-Butyl acetate	NGS	96	<1.4	41.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029694	142-82-5	2-5	n-Heptane	NGS	96	<1.4	41.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029694	10061	0061-02-6	trans-1 3-Dichloropropene	NGS	00	<1.5	<12	pla	ola	cla	ofo		11 070

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a - LCS Outside Range T - Tentatively Identified Compound

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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	Cult	% ats	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	п/а	n/a	1.5	n/a U
S16T029695	75-34-3	1,1-Dichloroethane	NGS	86	<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	66	<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	66	<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	86	<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	111-70-6	1-Heptanol	NGS	98	<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	e/u	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	92	<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	88	<4.3	44	n/a	n/a	n/a	n/a	4.3	n/a
S16T029695	75-05-8	Acetonitrile	NGS	06	<1.8	59	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	86	<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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N - Named TIC Q - Qualitative B - Blank Contamination

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

Sample# R	A# CAS#	Analyte	Unit	% dts	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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 U
S16T029695	71-43-2	Benzene	NGS	97	<1.2	2.1	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029695	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	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 J
S16T029695	109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	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 U
S16T029695	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029695	75-00-3	Chloroethane	NGS	98	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029695	67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029695	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029695	124-18-5	Decane	NGS	98	<2.8	19	n/a	n/a	n/a	n/a	2.8	n/a
S16T029695	64-17-5	Ethanol	NGS	66	4.7>	16	e/u	n/a	n/a	n/a	7.4	n/a J
S16T029695	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029695	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029695	110-00-9	Furan	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	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 J
S16T029695	628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	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 U
S16T029695	75-09-2	Methylene Chloride	NGS	86	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	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 U
S16T029695	98-95-3	Nitrobenzene	NGS	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029695	110-59-8	Pentanenitrile	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029695	107-12-0	Propanenitrile	NGS	86	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	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 U
S16T029695	100-42-5	Styrene	NGS	100	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	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
S16T029695	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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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	Result Duplicate	Average	RPD % Spk Rec %		Limit Cut Er	Det Limit Cut Err % Qual Flags
VAPOR-TDU VOA #2	U 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	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	υ a/υ
S16T029695	10061-01-5	5 cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U a/c
S16T029695	123-86-4	n-Butyl acetate	NGS	98	4.1>	41.4	n/a	n/a	n/a	n/a	4.1	Va U
S16T029695	142-82-5	n-Heptane	NGS	96	4.1.4	<1.4	n/a	n/a	n/a	n/a	1.4	u/a U
S16T029695	10061-02-6	6 trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	U a/u

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N - Named TIC Q - Qualitative B - Blank Contamination

Y - Comment U - Less Than Detection Limit

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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	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cut Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T029696	79-34-5	1,1,2,2-Tetrachloroethane	SSN	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	٦
S16T029696	2-00-62	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	5
S16T029696	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		_
S16T029696	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a U	2
S16T029696	107-06-2	1,2-Dichloroethane	NGS	100	<1.6	41.6	n/a	n/a	n/a	n/a	1.6		_
S16T029696	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<1.2	3.0	n/a	n/a	n/a	n/a	1.2		
S16T029696	106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		_
S16T029696	123-91-1	1,4-Dioxane	NGS	98	<1.7	41.7	n/a	n/a	n/a	n/a	1.7	n/a U	2
S16T029696	71-36-3	1-Butanol	NGS	120	<8.9	257	n/a	n/a	n/a	n/a	8.9		>
S16T029696	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U	2
S16T029696	71-23-8	1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	U/a U	2
S16T029696	108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	U/a U	_
S16T029696	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	2
S16T029696	78-93-3	2-Butanone	NGS	100	<1.9	7.3	n/a	n/a	n/a	n/a	1.9	n/a,	,
S16T029696	110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	2
S16T029696	591-78-6	2-Hexanone	NGS	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2		7
S16T029696	534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	_
S16T029696	78-94-4	3-Buten-2-one	NGS	100	<1.7	3.9	n/a	n/a	n/a	n/a	1.7		7
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	92	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	U/a/U	ם
S16T029696	105-42-0	4-Methyl-2-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	ם
S16T029696	108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	U/a U	D
S16T029696	67-64-1	Acetone	NGS	88	<4.3	44	n/a	n/a	n/a	n/a	4.3	n/a	
S16T029696	75-05-8	Acetonitrile	NGS	06	<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	7
S16T029696	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a L	٦
S16T029696	107-18-6	Allyl Alcohol	NGS	110	630	130	ofo	1					

a - LCS Outside Range T - Tentatively Identified Compound

N - Named TIC Q - Qualitative B - Blank Contamination

Y - Comment U - Less Than Detection Limit

J - Estimated E - Outside Calibration Range

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

Sample# R	A# CAS#	Analyte	Chit	% QLS	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	VOA #2		100									
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	86	<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	41.6	<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	96	<1.9	4.5	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029696	67-66-3	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	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029696	124-18-5	Decane	NGS	98	<2.8	14	n/a	n/a	n/a	n/a	2.8	n/a
S16T029696	64-17-5	Ethanol	NGS	66	4.7>	65	n/a	n/a	n/a	n/a	7.4	n/a
S16T029696	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029696	100-41-4	Ethylbenzene	NGS	66	<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	26	<1.7	2.2	n/a	n/a	n/a	e/u	1.7	n/a J
S16T029696	628-73-9	Hexanenitrile	NGS	92	<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	41.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029696	75-09-2	Methylene Chloride	NGS	86	<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	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029696	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029696	107-12-0	Propanenitrile	NGS	88	<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	99	n/a	n/a	n/a	n/a	1.6	n/a
S16T029696	108-88-3	Toluene	NGS	96	74.5	20			1	-		

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

J - Estimated E - Outside Calibration Range

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	% drs	Blank	Result	Result Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDI	U 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	86	<1.6	2.1	n/a	n/a	n/a	n/a	1.6	u/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	∪/a	
S16T029696	123-86-4	n-Butyl acetate	NGS	94	4.12	4.1>	n/a	n/a	n/a	n/a	1.4	U/a U	
S16T029696	142-82-5	n-Heptane	NGS	96	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U	
S16T029696	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	12	n/a U	

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative B - Blank Contamination

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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	% dTS	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	26	<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	86	<1.2	<1.2	n/a	n/a		n/a	1.2	n/a U
S16T029697	75-35-4	1,1-Dichloroethene	NGS	66	<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	1.6	n/a U
S16T029697	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	86	<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	8.9	n/a UY
S16T029697	111-70-6	1-Heptanol	NGS	98	9'9>	<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 J
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	85	<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 J
S16T029697	106-35-4	3-Heptanone	NGS	36	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029697	106-68-3	3-Octanone	NGS	96	<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	88	<4.3	45	n/a	n/a	n/a	n/a	4.3	n/a
S16T029697	75-05-8	Acetonitrile	NGS	06	<1.8	270	n/a	n/a	n/a	n/a	1.8	n/a
S16T029697	98-86-2	Acetophenone	NGS	96	<2.6	8.7	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029697	107-13-1	Acrylonitrile	NGS	86	<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	eju	20	Hola

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

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Y - Comment U - Less Than Detection Limit

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

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

Sample# R	A# CAS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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 U
S16T029697	71-43-2	Benzene	SSN	97	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029697	100-47-0	Benzonitrile	SDN	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	
S16T029697	123-72-8	Butanal	NGS	110	<2.1	3.3	n/a	n/a	n/a	n/a	2.1	n/a J
S16T029697	109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	
S16T029697	56-23-5	Carbon tetrachloride	SDN	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029697	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029697	75-00-3	Chloroethane	NGS	95	41.9	4.3	e/u	n/a	n/a	n/a	1.9	
S16T029697	67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T029697	110-82-7	Cyclohexane	SDN	66	<1.8	<1.8	. n/a	n/a	n/a	n/a	1.8	n/a U
S16T029697	124-18-5	Decane	NGS	95	<2.8	9.5	n/a	n/a	n/a	n/a	2.8	
S16T029697	64-17-5	Ethanol	NGS	66	4.7>	130	n/a	n/a	n/a	n/a	7.4	n/a
S16T029697	141-78-6	Ethyl acetate	SDN	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029697	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029697	110-00-9	Furan	NGS	98	<1.6	<1.6	• n/a	n/a	e/u	n/a	1.6	n/a U
S16T029697	110-54-3	Hexane	NGS	26	<1.7	1.9	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029697	628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029697	126-98-7	Methacrylonitrile	NGS	100	<1.6	3.8	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029697	75-09-2	Methylene Chloride	NGS	86	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a U
S16T029697	91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	e/u	n/a	3.7	n/a U
S16T029697	88-95-3	Nitrobenzene	NGS	6	<2.6	<2.6	n/a	n/a	e/u	n/a	2.6	n/a U
S16T029697	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029697	107-12-0	Propanenitrile	NGS	86	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029697	110-86-1	Pyridine	NGS	120	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a U
S16T029697	100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029697	127-18-4	Tetrachloroethene	NGS	100	<1.6	64	n/a	n/a	n/a	n/a	1.6	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 J

N - Named TIC Q - Qualitative B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flaos
VAPOR-TDU VOA #2	J 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	86	<1.6	4.8	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029697	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
S16T029697	123-86-4	n-Butyl acetate	NGS	96	4.1.4	4.12	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029697	142-82-5	n-Heptane	NGS	96	4.1.4	4.1>	n/a	n/a	n/a	n/a	1.4	n/a/U
S16T029697	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	12	II/a []

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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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	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	1.3	n/a U
S16T029698	2-00-62	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029698	75-34-3	1,1-Dichloroethane	NGS	88	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029698	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	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	1.6	n/a U
S16T029698	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<1.2	<1.2	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	2.0	n/a U
S16T029698	123-91-1	1,4-Dioxane	NGS	86	<1.7	<1.7	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	8.9	n/a UY
S16T029698	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	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	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	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	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	1.9	n/a J
S16T029698	110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	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	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	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	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	1.5	n/a Y
S16T029698	106-68-3	3-Octanone	NGS	98	<2.4	<2.4	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	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	1.9	n/a U
S16T029698	67-64-1	Acetone	NGS	88	<4.3	98	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	1.8	n/a E
S16T029698	98-86-2	Acetophenone	NGS	96	<2.6	9.6	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029698	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	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	3.9	n/a U

NA = Not Analyzed, ND = Not Detected

N - Named TIC Q - Qualitative B - Biank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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-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	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	1 VOA #2								-				
S16T029698	107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	u/a U	Ī
S16T029698	71-43-2	Benzene	SDN	26	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a J	
S16T029698	100-47-0	Benzonitrile	SDN	86	<1.9	<1.9	n/a	n/a	n/a	e/u	1.9	n/a U	
S16T029698	123-72-8	Butanal	SDN	110	<2.1	42.1	n/a	n/a	n/a	n/a	2.1	n/a U	
S16T029698	109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029698	56-23-5	Carbon tetrachloride	SDN	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	96	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a J	
S16T029698	67-66-3	Chloroform	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	U/a U	
S16T029698	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U	
S16T029698	124-18-5	Decane	SDN	95	<2.8	6.6	n/a	n/a	n/a	n/a	2.8	n/a J	
S16T029698	64-17-5	Ethanol	NGS	66	4.7>	240	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029698	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029698	100-41-4	Ethylbenzene	SSN	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	U/a U	
S16T029698	110-00-9	Furan	SDN	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	U/a U	
S16T029698	110-54-3	Hexane	NGS	6	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	
S16T029698	628-73-9	Hexanenitrile	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	U/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	88	<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	U/a U	
S16T029698	98-95-3	Nitrobenzene	NGS	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U	
S16T029698	110-59-8	Pentanenitrile	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	88	<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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Y - Comment 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

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

Sample# R	A# CAS#	41:	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 VOA #2												
S16T029698	79-01-6	1-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029698	75-69-4	9-4	Trichlorofluoromethane	NGS	86	<1.6	14	e/u	n/a	n/a	n/a	1.6	n/a
S16T029698	1006	0061-01-5	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	86-4	n-Butyl acetate	NGS	96	4.1>	<1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029698	142-82-5	82-5	n-Heptane	NGS	96	4.1>	<1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029698	1006	0061-02-6	trans-1,3-Dichloropropene	NGS	66	<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-E
Customer Sample ID: 16-07837-2-EFF-E

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	-	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	I 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	2-00-62	1,1,2-Trichloroethane	NGS	26	<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	86	<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	66	<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	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	86	<4.7	<1.7	u/u	e/u	n/a	n/a	1.7	U 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	98	<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	U a/n
S16T029699	591-78-6	2-Hexanone	NGS	85	<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	e/u	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	92	<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	88	<4.3	240	n/a	n/a	n/a	n/a	4.3	n/a
S16T029699	75-05-8	Acetonitrile	NGS	06	<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	88	<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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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	Cuit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 VOA #2											
S16T029699	107-05-1	Allyl Chloride	SDN	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029699	71-43-2	Benzene	SON	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029699	100-47-0	Benzonitrile	SDN	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029699	123-72-8	Butanal	SON	110	<2.1	42.1	n/a	n/a	n/a	e/u	2.1	n/a U
S16T029699	109-74-0	Butanenitrile	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029699	56-23-5	Carbon tetrachloride	SON	100	41.6	<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	96	<1.9	5.1	n/a	n/a	n/a	n/a	1.9	L e/u
S16T029699	67-66-3	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	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029699	124-18-5	Decane	NGS	98	<2.8	5.1	n/a	n/a	n/a	n/a	2.8	L/a/J
S16T029699	64-17-5	Ethanol	NGS	66	4.7>	280	n/a	n/a	n/a	n/a	7.4	n/a
S16T029699	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029699	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029699	110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	U/a U
S16T029699	110-54-3	Hexane	NGS	16	<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	86	<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	16	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029699	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029699	107-12-0	Propanenitrile	NGS	86	<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
S16T029699	108-88-3	Toluene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	Ulali.

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	% ats	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	pk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2											
S16T029699	79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/alU
S16T029699	75-69-4	Trichlorofluoromethane	NGS	86	<1.6	28	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	96	4.1.4	<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	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029699	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U

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N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

VAPOR-TDU VOA #2 S16T029700 79-34-5 1,1,2-Tetrachloroethane S16T029700 75-34-3 1,1,2-Trichloroethane S16T029700 75-34-3 1,1-Dichloroethane S16T029700 76-35-4 1,1-Dichloroethane S16T029700 107-06-2 1,2-Dichloroethane S16T029700 107-06-2 1,2-Dichloroethane S16T029700 108-47-7 1,4-Dichlorophopene S16T029700 111-70-6 1,4-Dichlorophopene S16T029700 17-36-3 1-Butanol S16T029700 17-36-3 1-Butanol S16T029700 17-28-9 1-Propanol S16T029700 108-47-4 2-A-Dimethylpyridine S16T029700 17-8-3 1-Butanone S16T029700 10-43-0 2-Heptanone S16T029700 10-43-0 2-Heptanone S16T029700 10-6-83-3 2-Butanone S16T029700 10-8-3-4 3-Heptanone S16T029700 10-8-3-4 3-Buten-2-one S16T029700 10-8-3-4 3-Heptanone			200	DIGILIA	Kesuit	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	THE PRINT	Det Limit on Err % Qual Flags	Jai Flags
79-34-5 19-34-5 17-34-3 17-35-4 17-36-2 17-36-3 11-70-6 17-36-3 11-70-6 17-36-3 11-70-6 17-36-3 110-43-0 25-4-4 37-56-6 17-36-3 1708-29-8 25-34-4 37-36-4 1708-29-8 25-34-4 37-36-4 1708-35-4 37-36-4 1706-35-4 37-36-4 175-05-8 38-86-2 47-36-5 175-05-8 47-36-5 175-05-8 47-36-5 175-05-8 47-36-5 175-05-8 1												
79-00-5 75-34-3 175-34-3 176-34-3 117-06-2 110-46-7 111-70-6 111-70-7 111-7 11-7	1,2,2-Tetrachloroethane	NGS	100	×1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	
75-34-3 1 75-35-4 1 107-06-2 1 106-46-7 1 113-91-1 1 11-70-6 1 111-70-6 1 111-70-6 1 111-70-6 1 111-70-6 1 110-3-0 1 110-3-0 1 110-3-0 1 110-3-0 1 110-3-0 1 106-35-4 3 106-68-3 3 106-68-3 3 106-68-3 3 106-68-3 3 106-68-3 3 106-68-3 4 106-35-4 3 106-68-3 3 106-7-3-1 4 107-13-1 4	loroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
75-35-4 107-06-2 107-06-2 106-46-7 113-91-1 117-36-3 111-70-6 117-38-3 111-70-6 110-43-0 108-47-4 110-43-0 106-35-4 1	oethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		
107-06-2	oethene	NGS	66	×1.3	<1.3	n/a	n/a			1.3		
106-45-7 106-46-7 106-46-7 117-36-3 111-70-6 111-70-6 111-70-6 1110-43-0 110-43-0 110-43-0 106-35-4 110-43-0 106-35-4 106-35-4 106-42-0	oethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
106.46.7 123.91.1 71.36.3 111.70-6 71.23.8 7108.29-8 78.93.3 110.43.0 891.78-6 534.22.5 78-94.4 106.68-3 106.68-3 106.68-3 106.42-0 106.42-0 106.42-0 106.42-0 106.42-0 106.42-0 106.42-0 106.43-1 106.42-0 106.43-1 106.43	,3-Dichloropropene (Total)	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	u/a U	
123-91-1 71-36-3 111-70-6 71-23-8 108-47-4 1708-29-8 78-93-3 110-43-0 591-78-6 534-22-5 78-94-4 106-68-3 106-68-3 106-68-3 106-68-3 106-68-3 106-68-3 106-68-3 106-7-1 108-10-1 108-1 1	obenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	u/a U	
71-36-3 111-70-6 71-23-8 108-47-4 1708-29-8 78-93-3 110-43-0 591-78-6 534-22-5 78-94-4 106-68-3 106-68-3 106-68-3 106-68-3 106-7-1 108-10-1 108-1 1	9	NGS	98	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		
111-70-6 71-23-8 108-47-4 1708-29-8 78-93-3 110-43-0 591-78-6 534-22-5 78-94-4 106-68-3 105-42-0 106-68-3 106-68-3 106-68-3 105-42-1 106-68-3 106-68-3 106-68-3 106-68-3 106-68-3 106-68-3 106-7-1 108-10-1 108		NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9		_
71-23-8 108-47-4 1706-29-8 78-93-3 110-43-0 591-78-6 534-22-5 78-94-4 106-68-3 106-68-3 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-42-0 105-43-1 105-4		NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	u/a U	
108.47.4 1708.29.8 18-93.3 110.43.0 591.78.6 534.22.5 78-94.4 106.88.3 106.68.3 105.42.0 106.83.4 106.83.4 106.42.0 108.10.1 67.54.1 75.05.8 98-86.2		NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a U	
1708-29-8 78-93-3 110-43-0 591-78-6 534-22-5 78-94-4 106-68-3 106-68-3 105-68-3 105-4-1 75-05-8 98-86-2 107-13-1	lylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a U	
78-93-3 110-43-0 591-78-6 591-78-6 534-22-5 78-94-4 106-68-3 106-68-3 105-42-0 108-10-1 67-64-1 75-05-8 98-86-2 107-13-1	ofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		
110-43-0 591-78-6 534-22-5 78-94-4 106-88-3 105-42-0 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	o	NGS	100	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a J	8
591-78-6 534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	ne	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	U/a U	
534-22-5 78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	е	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	u/a U	
78-94-4 106-35-4 106-68-3 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	ran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	
106-35-4 106-68-3 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	one	NGS	100	<1.7	<1.7	n/a	n/a	n/a	e/u	1.7	n/a U	
106-68-3 105-42-0 108-10-1 67-54-1 75-05-8 98-86-2 107-13-1	ne	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	u/a U	
105-42-0 108-10-1 67-64-1 75-05-8 98-86-2 107-13-1	•	NGS	. 95	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a U	
108-10-1 67-64-1 75-05-8 98-86-2 107-13-1	-hexanone	NGS	94	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a U	
67-64-1 75-05-8 98-86-2 107-13-1	-Pentanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	
75-05-8 98-86-2 107-13-1		NGS	88	<4.3	120	n/a	n/a	n/a	n/a	4.3	n/a	
98-86-2		NGS	06	<1.8	330	n/a	n/a	n/a	n/a	1.8	n/a	
107-13-1	one	NGS	96	<2.6	3.0	n/a	n/a	n/a	n/a	2.6	n/a J	
	0	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	
S16T029700 107-18-6 Allyl Alcohol	0	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-F
Customer Sample ID: 16-07837-2-EFF-F

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	_	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	26	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029700	100-47-0	Benzonitrile	NGS	86	<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	42.1	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	SON	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	98	<1.9	3.3	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029700	67-66-3	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	SSN	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029700	124-18-5	Decane	NGS	92	<2.8	3.5	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029700	64-17-5	Ethanol	NGS	66	4.7>	230	n/a	n/a	n/a	n/a	7.4	n/a
S16T029700	141-78-6	Ethyl acetate	SDN	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029700	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029700	110-00-9	Furan	SSN	95	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029700	110-54-3	Hexane	NGS	26	<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	86	<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	26	<2.6	<2.6	n/a	n/a	e/u	n/a	2.6	n/a U
S16T029700	110-59-8	Pentanenitrile	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	86	<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
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	% dTS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDI	J 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	86	<1.6	28	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	96	4.1>	4.1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029700	142-82-5	n-Heptane	NGS	96	4.12	4.12	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029700	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<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	Chit	% OTS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	1.3	n/a U
S16T029701	2-00-62	1,1,2-Trichloroethane	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029701	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	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	1.6	n/a U
S16T029701	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<1.2	3.3	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	2.0	n/a U
S16T029701	123-91-1	1,4-Dioxane	NGS	86	<1.7	<1.7	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	8.9	n/a UY
S16T029701	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	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	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	3.3	n/a U
S16T029701	1708-29-8	8 2,5-Dihydrofuran	NGS	100	<2.8	<2.8	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	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	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	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	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	1.7	n/a U
S16T029701	106-35-4	3-Heptanone	NGS	98	<1.5	<1.5	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	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	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	1.9	n/a U
S16T029701	67-64-1	Acetone	NGS	88	<4.3	1.2E+03	n/a	n/a	n/a	n/a	4.3	n/a E
S16T029701	75-05-8	Acetonitrile	NGS	06	<1.8	490	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	2.6	n/a U
S16T029701	107-13-1	Acrylonitrile	NGS	88	<1.7	<1.7	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	3.0	n/a []

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

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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 U
S16T029701	71-43-2	Benzene	NGS	6	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029701	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029701	123-72-8	Butanal	NGS	110	42.1	42.1	n/a	n/a	n/a	n/a	2.1	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 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 U
S16T029701	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701	75-00-3	Chloroethane	NGS	98	6.1>	5.4	n/a	n/a	n/a	e/u	1.9	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 U
S16T029701	110-82-7	Cyclohexane	NGS	66	<1.8	8.9	n/a	n/a	n/a	n/a	1.8	n/a J
S16T029701	124-18-5	Decane	NGS	96	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029701	64-17-5	Ethanol	NGS	66	4.7>	420	n/a	n/a		n/a	7.4	n/a
S16T029701	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029701	110-00-9	Furan	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	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 U
S16T029701	628-73-9	Hexanenitrile	NGS	35	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	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 U
S16T029701	75-09-2	Methylene Chloride	NGS	86	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a U
S16T029701	91-20-3	Naphthalene	NGS	100	<3.7	<3.7	e/u	n/a	n/a	n/a	3.7	n/a U
S16T029701	98-95-3	Nitrobenzene	NGS	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029701	110-59-8	Pentanenitrile	NGS	85	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029701	107-12-0	Propanenitrile	NGS	88	<1.4	13	n/a	n/a	n/a	n/a	1.4	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 U
S16T029701	100-42-5	Styrene	NGS	100	<1.6	4.9	n/a	n/a	n/a	n/a	1.6	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
S16T029701	108-88-3	Toluene	NGS	96	<1.5	4.8	n/a	n/a	n/a	n/a	1.5	n/a I

N - Named TIC Q - Qualitative B - Blank Contamination

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	4.1>	4.1.4	п/а	n/a	n/a	n/a	1.4	n/a U
\$167029701	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U

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N - Named TIC Q - Qualitative B - Blank Contamination

Y - Comment U - Less Than Detection Limit

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	U 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	2
S16T029702	5-00-64	1,1,2-Trichloroethane	NGS	26	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	∪a ∪	2
S16T029702	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	2
S16T029702	75-35-4	1,1-Dichloroethene	NGS	66	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a U	2
S16T029702	107-06-2	1,2-Dichloroethane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	U/a U	2
S16T029702	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	2
S16T029702	123-91-1	1,4-Dioxane	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	U e/u	2
S16T029702	71-36-3	1-Butanol	NGS	120	<8.9	<8.9	n/a	n/a	n/a	n/a	8.8	n/a UY	5
S16T029702	111-70-6	1-Heptanol	NGS	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U	2
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	2
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	2
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	2
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	2
S16T029702	110-43-0	2-Heptanone	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	5
S16T029702	591-78-6	2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	0
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	92	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	_
S16T029702	106-68-3	3-Octanone	NGS	98	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a U	. 0
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	, D
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	67-64-1	Acetone	NGS	68	<4.3	2.1E+03	n/a	n/a	n/a	n/a	4.3	n/a	ш
S16T029702	75-05-8	Acetonitrile	NGS	06	<1.8	650	n/a	n/a	n/a	n/a	1.8	n/a	ш
S16T029702	98-86-2	Acetophenone	NGS	96	<2.6	3.4	n/a	n/a	n/a	n/a	2.6	n/a	_
S16T029702	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	ם
S16T029702	107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	U/a U	כ

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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	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 VOA #2											2
S16T029702	107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/alu
S16T029702	71-43-2	Benzene	NGS	6	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029702	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029702	123-72-8	Butanal	NGS	110	42.1	42.1	n/a	n/a	n/a	n/a	2.1	n/a U
S16T029702	109-74-0	Butanenitrile	NGS	26	<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	67-66-3	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	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029702	124-18-5	Decane	NGS	98	<2.8	3.8	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029702	64-17-5	Ethanol	NGS	66	4.7>	530	n/a	n/a	n/a	n/a	7.4	n/a
S16T029702	141-78-6	Ethyl acetate	NGS	66	<1.5	<1,5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029702	100-41-4	Ethylbenzene	NGS	66	<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	26	<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	Methacryfonitrile	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	86	<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	43.7	n/a	n/a	n/a	n/a	3.7	n/a U
S16T029702	98-95-3	Nitrobenzene	NGS	26	<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	86	<1.4	59	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	Tetrachloroethene	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	118/11

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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	Result Duplicate	Average	1000	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	lual 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	86	<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 L	_
S16T029702	123-86-4	n-Butyl acetate	NGS	8	<1.4	4.12	n/a	n/a	n/a	n/a	1.4	n/a L	_
S16T029702	142-82-5	n-Heptane	NGS	96	<1.4	4.1>	n/a	n/a	n/a	n/a	1.4	n/a	_
S16T029702	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a L	

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flaos
VAPOR-TDU VOA #2	J VOA #2											
S16T029703	79-34-5	1,1,2,2-Tetrachloroethane	SON	100	<1.3	<1.3	e/u	n/a	n/a	n/a	1.3	n/a U
S16T029703	79-00-5	1,1,2-Trichloroethane	NGS	26	<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	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029703	75-35-4	1,1-Dichloroethene	NGS	66	<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	66	<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	86	<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	98	<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	92	<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	ηla	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	92	<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	88	<4.3	6.2E+03	n/a	n/a	n/a	n/a	4.3	n/a EY
S16T029703	75-05-8	Acetonitrile	NGS	06	<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	86	<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	11/2

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a - LCS Outside Range T - Tentatively Identified Compound

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

Y - Comment U - Less Than Detection Limit

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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	Cuit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	
S16T029703	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029703	123-72-8	Butanal	NGS	110	42.1	23	n/a	n/a	n/a	n/a	2.1	n/a
S16T029703	109-74-0	Butanenitrile	NGS	96	<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	98	<1.9	7.2	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029703	67-66-3	Chloroform	SSN	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029703	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029703	124-18-5	Decane	NGS	92	<2.8	21	n/a	n/a	n/a	n/a	2.8	n/a
S16T029703	64-17-5	Ethanol	NGS	66	4.7.4	009	n/a	n/a	n/a	n/a	7.4	n/a
S16T029703	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029703	100-41-4	Ethylbenzene	NGS	66	<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	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029703	628-73-9	Hexanenitrile	NGS	98	<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	86	<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	Pentanenitrile	NGS	85	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a
S16T029703	107-12-0	Propanenitrile	NGS	88	<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

a - LCS Outside Range T - Tentatively Identified Compound

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Y - Comment U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

N - Named TIC Q - Qualitative B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	sto %	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ral Flaos
VAPOR-TD	U VOA #2												
S16T029703	79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/alu	
S16T029703	75-69-4	Trichlorofluoromethane	NGS	88	<1.6	130	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029703	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	7.9	n/a	n/a	n/a	n/a	1.3	n/a J	
S16T029703	123-86-4	n-Butyl acetate	NGS	98	<1.4	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	4.12	n/a	n/a	n/a	n/a	1.4	n/a U	
S16T029703	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	12		

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

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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 %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flaos
VAPOR-TDU VOA #2	J 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/alu
S16T029704	79-00-5	1,1,2-Trichloroethane	NGS	26	<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	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029704	75-35-4	1,1-Dichloroethene	NGS	66	<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	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029704	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	86	<1.7	3.9	e/u	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	98	<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	98	<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-Methyffuran	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	92	<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	67-64-1	Acetone	NGS	88	<4.3	6.7E+03	n/a	n/a	n/a	n/a	4.3	n/a EY
S16T029704	75-05-8	Acetonitrile	NGS	06	<1.8	200	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	86	<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	3.0	II e/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

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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 %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	46	<1.2	12	n/a	n/a	n/a	n/a	1.2	n/a
S16T029704	100-47-0	Benzonitrile	NGS	86	<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
S16T029704	109-74-0	Butanenitrile	NGS	96	<1.2	55	n/a	n/a	n/a	n/a	1.2	n/a
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	382	<1.9	8.1	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029704	67-66-3	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	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029704	124-18-5	Decane	NGS	98	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a
S16T029704	64-17-5	Ethanol	NGS	66	4.7>	720	n/a	n/a	n/a	n/a	7.4	n/a
S16T029704	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029704	100-41-4	Ethylbenzene	NGS	66	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a J
S16T029704	110-00-9	Furan	NGS	96	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029704	110-54-3	Hexane	NGS	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029704	628-73-9	Hexanenitrile	NGS	96	<1.5	160	n/a	n/a	n/a	n/a	1.5	n/a
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	86	<2.7	3.3	n/a	n/a	n/a	n/a	2.7	n/a J
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	26	<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
S16T029704	107-12-0	Propanenitrile	NGS	86	4.1>	98	n/a	n/a	n/a	n/a	1.4	n/a
S16T029704	110-86-1	Pyridine	NGS	120	<3.8	28	n/a	n/a	n/a	n/a	3.8	n/a
S16T029704	100-42-5	Styrene	NGS	100	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029704	127-18-4	Tetrachloroethene	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a
S16T029704	108-88-3	Toluene	NGS	96	<1.5	14	n/a	n/a	n/a	n/a	1,5	n/a

a - LCS Outside

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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	% atts	Blank	Result	Result Duplicate Average RPD % Spk Rec %	Average	RPD %			Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	U 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 L	
S16T029704	75-69-4	Trichlorofluoromethane	NGS	86	<1.6	160	n/a	n/a	n/a	n/a	1.6	n/a	ľ
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	
S16T029704	123-86-4	n-Butyl acetate	NGS	94	4.1>	4.12	n/a	n/a	n/a	n/a	1.4	-	
S16T029704	142-82-5	n-Heptane	NGS	96	<1.4	4.1>	n/a	n/a	n/a	n/a	1.4		
S16T029704	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	U/a U	

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R /	A# CAS#	Analyte	Unit	% OTS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	VOA #2					,						
S16T029705	79-34-5	1,1,2,2-Tetrachloroethane	SDN	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a[U
S16T029705	2-00-62	1,1,2-Trichloroethane	NGS	26	. <1.5	<1.5	n/a	n/a	n/a	n/a	1.5	
S16T029705	75-34-3	1,1-Dichloroethane	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029705	75-35-4	1,1-Dichloroethene	NGS	66	<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	41.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029705	542-75-6	1,3-Dichloropropene (Total)	NGS	66	<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	86	<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	98	<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	e/u	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	98	<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	106-68-3	3-Octanone	NGS	98	<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	67-64-1	Acetone	NGS	88	<4.3	5.2E+03	n/a	n/a	n/a	n/a	4.3	n/a EY
S16T029705	75-05-8	Acetonitrile	NGS	06	<1.8	460	n/a	n/a	n/a	n/a	1.8	n/a E
S16T029705	38-86-2	Acetophenone	NGS	96	<2.6	22	n/a	n/a	n/a	n/a	2.6	n/a
S16T029705	107-13-1	Acrylonitrile	NGS	86	<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

a - LCS Outside Range T - Tentatively Identified Compound

N - Named TIC Q - Qualitative B - Blank Contamination

Y - Comment U - Less Than Detection Limit

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

Sample# R	A# CAS#	Analyte	Cuit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	26	<1.2	10	n/a	n/a	n/a	n/a	1.2	
S16T029705	100-47-0	Benzonitrile	NGS	86	<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	98	<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	66	<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	66	4.7>	920	n/a	n/a	n/a	n/a	7.4	n/a
S16T029705	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029705	100-41-4	Ethylbenzene	NGS	66	<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	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029705	628-73-9	Hexanenitrile	NGS	98	<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	86	<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	26	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029705	110-59-8	Pentanenitrile	NGS	85	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a
S16T029705	107-12-0	Propanenitrile	NGS	86	<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	108-88-3	Toluene	NGS	96	<1.5	11	n/a	n/a	2/4	e/u	4.	1 0/0

N - Named TIC Q - Qualitative B - Blank Contamination

a - LCS Outside Range T - Tentatively Identified Compound

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NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T029705	79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/alu
S16T029705	75-69-4	Trichlorofluoromethane	NGS	86	<1.6	140	n/a	n/a	n/a	n/a	1.6	
S16T029705	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	1,8	n/a	n/a	n/a	n/a	13	
S16T029705	123-86-4	n-Butyl acetate	NGS	26	<1.4	4.12	n/a	n/a	n/a	n/a	1.4	
S16T029705	142-82-5	n-Heptane	NGS	96	<1.4	41.4	n/a	n/a	n/a		1.4	
S16T029705	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a		12	

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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

12 - Oct - 2016 11:43:58 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12

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	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	29-00-5	1,1,2-Trichloroethane	SSN	26	<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	86	<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	66	<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	66	<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	86	<1.7	<1.7	e/u	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	98	<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
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	e/u	n/a	n/a	n/a	1.6	n/a
S16T029706	591-78-6	2-Hexanone	NGS	85	<1.2	33	n/a	n/a	n/a	n/a	1.2	n/a
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
S16T029706	106-35-4	3-Heptanone	NGS	95	<1.5	220	n/a	n/a	n/a	n/a	1.5	n/a
S16T029706	106-68-3	3-Octanone	NGS	98	<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	68	<4.3	6.2E+03	n/a	n/a	n/a	n/a	4.3	n/a EY
S16T029706	75-05-8	Acetonitrile	NGS	06	<1.8	420	n/a	n/a	n/a	n/a	1.8	n/a E
S16T029706	38-86-2	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	88	<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

N - Named TIC Q - Qualitative B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Chit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	26	<1.2	10	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029706	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029706	123-72-8	Butanal	NGS	110	42.1	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	98	<1.9	5.2	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029706	67-66-3	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	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029706	124-18-5	Decane	NGS	92	<2.8	4.9	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029706	64-17-5	Ethanol	NGS	66	4.7>	110	n/a	n/a	n/a	n/a	7.4	n/a
S16T029706	141-78-6	Ethyl acetate	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029706	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029706	110-00-9	Furan	NGS	98	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029706	110-54-3	Hexane	NGS	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029706	628-73-9	Hexanenitrile	NGS	96	<1.5	120	n/a	n/a	n/a	n/a	1.5	n/a
S16T029706	126-98-7	Methacrytonitrile	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	86	<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	87	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029706	110-59-8	Pentanenitrile	NGS	85	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029706	107-12-0	Propanenitrile	NGS	88	<1.4	99	n/a	n/a	n/a	n/a	1.4	n/a
S16T029706	110-86-1	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 J
S16T029706	127-18-4	Tetrachloroethene	NGS	100	<1.6	31	n/a	n/a	n/a	n/a	1.6	n/a
S16T029706	108-88-3	Toluene	NGS	96	<1.5	8.0	n/a	n/a	n/a	n/a	1.5	n/a.J

N - Named TIC Q - Qualitative B - Blank Contamination

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J - Estimated E - Outside Calibration Range

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

SDG Number:

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags
VAPOR-TDU	J VOA #2											
S16T029706	79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/alu
S16T029706	75-69-4	Trichlorofluoromethane	NGS	86	<1.6	140	n/a	n/a	n/a	n/a	1.6	n/a
S16T029706	10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	13	n/all!
S16T029706	123-86-4	n-Butyl acetate	NGS	98	4.1>	41.4	n/a	n/a	n/a	0/2	14	U/a U
S16T029706	142-82-5	n-Heptane	NGS	96	41.4	110	n/a	n/a	n/a	n/a	1.4	0/9
S16T029706	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	12	U/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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cut Err %	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	D.
S16T029707	79-00-5	1,1,2-Trichloroethane	NGS	6	<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	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a QU
S16T029707	75-35-4	1,1-Dichloroethene	NGS	66	<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	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	2
S16T029707	106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		2
S16T029707	123-91-1	1,4-Dioxane	NGS	86 -	<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	98	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a U	O
S16T029707	71-23-8	1-Propanol	NGS	110	<3.0	7.8	n/a	n/a	n/a	n/a	3.0		n/a JQ
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	98	<1.6	45	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029707	591-78-6	2-Hexanone	NGS	95	<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	92	<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	Э
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 JQ
S16T029707	67-64-1	Acetone	NGS	88	<4.3	5.1E+03	n/a	n/a	n/a	n/a	4.3	n/a	n/a EQY
S16T029707	75-05-8	Acetonitrile	NGS	06	<1.8	120	n/a	n/a	n/a	n/a	1.8	n/a Q	a
S16T029707	98-86-2	Acetophenone	NGS	96	<2.6	11	n/a	n/a	n/a	n/a	2.6	U/a J	_
S16T029707	107-13-1	Acrylonitrile	NGS	86	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	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		Na QU

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

N - Named TIC Q - Qualitative B - Blank Contamination

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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# CAS#	Analyte	Cuit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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/alou
S16T029707	71-43-2	Benzene	NGS	26	<1.2	11	n/a	n/a	n/a	n/a	1.2	n/a JO
S16T029707	100-47-0	Benzonitrile	NGS	86	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029707	123-72-8	Butanal	SDN	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 O
S16T029707	56-23-5	Carbon tetrachloride	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a OU
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	98	6.1>	<1.9	n/a	n/a	n/a	n/a	1.9	n/a QU
S16T029707	67-66-3	Chloroform	SDN	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a QU
S16T029707	110-82-7	Cyclohexane	NGS	66	<1.8	41.8	n/a	n/a	n/a	n/a	1.8	n/alQU
S16T029707	124-18-5	Decane	SDN	95	<2.8	9.9	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029707	64-17-5	Ethanol	NGS	66	4.7>	9.3	n/a	n/a	n/a	n/a	7.4	n/a JQ
S16T029707	141-78-6	Ethyl acetate	NGS	66	<1.5	17	n/a	n/a	n/a	n/a	1.5	n/a Q
S16T029707	100-41-4	Ethylbenzene	NGS	66	<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 JQ
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	628-73-9	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	88	<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	26	<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	86	<1.4	99	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 JQ
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	90	<1 F	αα	ofo	ofu	-1-	-	1	

N - Named TIC Q - Qualitative B - Blank Contamination

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NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162744

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD % Spk Rec %		Det Limit Cnt Err % Qual Flags
VAPOR-TDI	J VOA #2										
S16T029707	79-01-6	Trichloroethene	NGS	100	<1.5	<1.5	n/a	n/a	n/a n/a	1.5	n/alou
S16T029707	75-69-4	Trichlorofluoromethane	NGS	86	<1.6	120	n/a	n/a	n/a n/a	1.6	
S16T029707	10061-01-5	cis-1,3-Dichloropropene	NGS	1001	<1.3	<1.3	n/a	n/a	n/a n/a		
S16T029707	123-86-4	n-Butyl acetate	NGS	26	<1.4	<1.4	n/a	n/a	n/a n/a	ľ	
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	66	<1.2	<1.2	n/a	n/a	n/a n/a	12	U/a Ol I

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J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

N - Named TIC Q - Qualitative B - Blank Contamination

Y - Comment U - Less Than Detection Limit

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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/alu
S16T029708	79-00-5	1,1,2-Trichloroethane	NGS	26	<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	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029708	75-35-4	1,1-Dichloroethene	NGS	66	<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	66	<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	86	<4.7	<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	98	<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
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
S16T029708	110-43-0	2-Heptanone	NGS	98	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a
S16T029708	591-78-6	2-Hexanone	NGS	85	<1.2	33	n/a	n/a	n/a	n/a	1.2	n/a
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
S16T029708	106-35-4	3-Heptanone	NGS	95	<1,5	220	n/a	n/a	n/a	n/a	1.5	n/a
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 J
S16T029708	67-64-1	Acetone	NGS	88	<4.3	4.4E+03	n/a	n/a	n/a	n/a	4.3	n/a E
S16T029708	75-05-8	Acetonitrile	NGS	06	<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	Acrytonitrile	NGS	86	<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	00	110/0

N - Named TIC Q - Qualitative B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	0
S16T029708	71-43-2	Benzene	NGS	26	<1.2	9.5	n/a	n/a	n/a	n/a	1.2	n/a	7
S16T029708	100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	5
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	ם
S16T029708	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	٦
S16T029708	75-00-3	Chloroethane	NGS	98	<1.9	6.5	n/a	n/a	n/a	n/a	1.9	n/a	,
S16T029708	67-66-3	Chloroform	NGS	100	<1,5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	٥
S16T029708	110-82-7	Cyclohexane	NGS	66	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U	ח
S16T029708	124-18-5	Decane	NGS	98	<2.8	5.6	n/a	n/a	n/a	n/a	2.8	n/a	7
S16T029708	64-17-5	Ethanol	NGS	66	47.4	120	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029708	141-78-6	Ethyl acetate	NGS	66	<1.5	<1,5	n/a	n/a	n/a	n/a	1.5	n/a	0
S16T029708	100-41-4	Ethylbenzene	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	ח
S16T029708	110-00-9	Furan	NGS	95	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	n/a	7
S16T029708	110-54-3	Hexane	NGS	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	כ
S16T029708	628-73-9	Hexanenitrile	NGS	95	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a (ם
S16T029708	126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ח
S16T029708	75-09-2	Methylene Chloride	NGS	86	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a U	ם
S16T029708	91-20-3	Naphthalene	NGS	100	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a U	ח
S16T029708	98-95-3	Nitrobenzene	NGS	16	<2.6	3.3	n/a	n/a	n/a	n/a	2.6	n/a	7
S16T029708	110-59-8	Pentanenitrile	NGS	92	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	7
S16T029708	107-12-0	Propanenitrile	NGS	86	<1.4	61	n/a	n/a	n/a	n/a	1.4	n/a	
S16T029708	110-86-1	Pyridine	NGS	120	<3.8	13	n/a	n/a	e/u	n/a	3.8	n/a	7
S16T029708	100-42-5	Styrene	NGS	100	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	7
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	7

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Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162744

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 %	Rec %	Det Limit	Det Limit Cot Err % Qual Flags
VAPOR-TDU VOA #2	U VOA #2				1							
S16T029708	79-01-6	Trichloroethene	SON	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029708	75-69-4	Trichlorofluoromethane	NGS	86	<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	98	<1.4	4.1.4	n/a	n/a	n/a	n/a	1.4	
S16T029708	142-82-5	n-Heptane	NGS	96	<1.4	61	n/a	n/a	n/a	n/a	1.4	
S16T029708	10061-02-6	trans-1,3-Dichloropropene	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	12	n/a []

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err 9	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	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	1.5		n/a U
S16T029709	75-34-3	1,1-Dichloroethane	NGS	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	J.E
S16T029709	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
S16T029709	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.E.
S16T029709	542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	יילנו	n/a U
S16T029709	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
S16T029709	123-91-1	1,4-Dioxane	SON	100	<1.7	<1.7	e/u	n/a	n/a	n/a	1.7	יקי	n/a U
S16T029709	71-36-3	1-Butanol	NGS	140	<8.9	350	n/a	n/a	n/a	n/a	8.9		n/a Ya
S16T029709	111-70-6	1-Heptanol	NGS	100	<5.6	9'5>	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	3.0	n/a	J.E
S16T029709	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
S16T029709	1708-29-8	2,5-Dihydrofuran	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	J C
S16T029709	78-93-3	2-Butanone	NGS	93	<1.9	340	n/a	n/a	n/a	n/a	1.9	n/a	
S16T029709	110-43-0	2-Heptanone	NGS	26	<1.6	43	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029709	591-78-6	2-Hexanone	NGS	98	<1.2	32	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	1.9	n/a	2
S16T029709	78-94-4	3-Buten-2-one	NGS	88	<1.7	13	n/a	n/a	n/a	n/a	1.7	n/a	_
S16T029709	106-35-4	3-Heptanone	NGS	26	<1.5	270	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	2.4	n/a L	D.
S16T029709	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
S16T029709	108-10-1	4-Methyl-2-Pentanone	NGS	26	<1.9	3.7	n/a	n/a	n/a	n/a	1.9	n/a	77
S16T029709	67-64-1	Acetone	NGS	88	<4.3	5.5E+03	n/a	n/a	n/a	n/a	4.3		n/a EY
S16T029709	75-05-8	Acetonitrile	NGS	91	<1.8	009	n/a	n/a	n/a	n/a	1.8	n/a	ш
S16T029709	98-86-2	Acetophenone	NGS	86	<2.6	6.3	n/a	n/a	n/a	n/a	2.6	n/a	2
S16T029709	107-13-1	Acrylonitrile	NGS	85	<1.7	2.0	n/a	n/a	n/a	n/a	1.7	n/a	7
S16T029709	107-18-6	Allyl Alcohol	NGS	120	<3.9	<3.9	n/a	n/a	n/a	- Na	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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte	Chit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Ont Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	J VOA #2												
S16T029709	107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/alu	ח
S16T029709	71-43-2	Benzene	NGS	86	<1.2	10	n/a	n/a	n/a				7
S16T029709	100-47-0	Benzonitrile	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		2
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		٦
S16T029709	108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		2
S16T029709	75-00-3	Chloroethane	NGS	86	41.9	6.1>	ה/ח	n/a	n/a	n/a	1.9		2
S16T029709	67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		2
S16T029709	110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U	ם
S16T029709	124-18-5	Decane	NGS	94	<2.8	4.8	n/a	n/a	n/a	n/a	2.8	n/a	7
S16T029709	64-17-5	Ethanol	NGS	110	4.7>	4.7>	n/a	n/a	n/a	n/a	7.4	n/a U	5
S16T029709	141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1,5	U/a U	2
S16T029709	100-41-4	Ethylbenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	2
S16T029709	110-00-9	Furan	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	ח
S16T029709	110-54-3	Hexane	NGS	96	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	2
S16T029709	628-73-9	Hexanenitrile	NGS	100	<1,5	2.4	n/a	n/a	n/a	n/a	1.5	L e/u	7
S16T029709	126-98-7	Methacrylonitrile	NGS	66	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	2
S16T029709	75-09-2	Methylene Chloride	NGS	100	<2.7	9.0	n/a	n/a	n/a	n/a	2.7	n/a	7
S16T029709	91-20-3	Naphthalene	NGS	26	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	2
S16T029709	98-95-3	Nitrobenzene	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	5
S16T029709	110-59-8	Pentanenitrile	NGS	26	<1.6	9.6	n/a	n/a	n/a	n/a	1.6	n/a	1
S16T029709	107-12-0	Propanenitrile	NGS	96	<1.4	28	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	-
S16T029709	100-42-5	Styrene	NGS	100	<1.6	2.3	n/a	n/a	n/a	n/a	1.6	n/a	-
S16T029709	127-18-4	Tetrachloroethene	NGS	110	<1,6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029709	108-88-3	Toluene	NGS	88	<1.5	7.9	n/a	6/0	n/a	c/u	1.5	ola	

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J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

N - Named TIC Q - Qualitative B - Blank Contamination

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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	% drs	Blank	Result	Result Duplicate	Average	RPD % 8	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	al Flags
VAPOR-TDU	U VOA #2								1				
S16T029709	79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	l
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	∪a U	
S16T029709	123-86-4	n-Butyl acetate	NGS	82	41.4	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U	
S16T029709	142-82-5	n-Heptane	NGS	96	4.12	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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a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162744

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	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	VOA #2											
S16T029710	79-34-5	1,1,2,2-Tetrachloroethane	SDN	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	66	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029710	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
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)	SSN	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	22	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029710	71-36-3	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
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	26	<1.6	45	n/a	n/a	n/a	n/a	1.6	n/a
S16T029710	591-78-6	2-Hexanone	NGS	98	<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	e/u	n/a	n/a	n/a	1.9	n/a U
S16T029710	78-94-4	3-Buten-2-one	NGS	88	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a
S16T029710	106-35-4	3-Heptanone	NGS	26	<1.5	280	n/a	n/a	n/a	n/a	1.5	n/a
S16T029710	106-68-3	3-Octanone	NGS	88	<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	26	<1.9	3.5	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029710	67-64-1	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	88	<2.6	2.8	n/a	n/a	n/a	n/a	2.6	n/a J
S16T029710	107-13-1	Acrylonitrile	NGS	85	<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	e/u	D)C	000	-1-

N - Named TIC Q - Qualitative B - Blank Contamination

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NA = Not Analyzed, ND = Not Detected

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162744

Sample# R	A# CAS#	Analyte		JIIIO	STD %	Diank	Kesuit	Result Duplicate	Average	2	Average RPD % Spk Kec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2												
S16T029710	107-05-1	1 Allyl Chloride		NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029710	71-43-2	Benzene		NGS	86	<1.2	9.1	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029710	100-47-0	0 Benzonitrile		NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029710	123-72-8	8 Butanal		NGS	110	42.1	48	n/a	n/a	n/a	n/a	2.1	n/a
S16T029710	109-74-0	0 Butanenitrile		NGS	26	<1.2	38	n/a	n/a	n/a	n/a	1.2	n/a
S16T029710	56-23-5	Carbon tetrachloride	loride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029710	108-90-7	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	86	- <1.9	6.1	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029710	67-66-3	Chloroform		NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029710	110-82-7	7 Cyclohexane		NGS	100	<1.8	<1.8	n/a	in/a	n/a	n/a	1.8	n/a U
S16T029710	124-18-5	5 Decane		NGS	94	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029710	64-17-5	Ethanol		NGS	110	4.7>	380	n/a	n/a	n/a	n/a	7.4	n/a
S16T029710	141-78-6	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	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	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	3 Hexane		NGS	96	<1.7	6.9	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029710	628-73-9	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	7 Methacrylonitrile	le e	NGS	66	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029710	75-09-2	Methylene Chloride	oride	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	26	<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	8 Pentanenitrile		NGS	26	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a
S16T029710	107-12-0) Propanenitrile		NGS	96	4.1×	20	n/a	n/a	n/a	n/a	1.4	n/a
S16T029710	110-86-1	1 Pyridine		NGS	130	<3.8	16	n/a	n/a	n/a	n/a	3.8	n/a J
S16T029710	100-42-5	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	4 Tetrachloroethene	ene	NGS	110	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a
S16T029710	108-88-3	3 Toluene		NGS	86	412	7.6	0/0	ala	-	-1-		10000

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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

Sampled R									-			
and the second	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate		RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	41.6	110	n/a	n/a	n/a	n/a	1.6	n/a
S16T029710	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
S16T029710	123-86-4	n-Butyl acetate	NGS	82	4.12	<1.4	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029710	142-82-5	n-Heptane	NGS	96	41.4	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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a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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Sample Group: 20162744

Cartridge Evaluation Data Summary Report

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

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

NGS 25.25 38146-99-5 1,1,1,3,5,5,7,7,7-Nonamethyl-3 QC Type VAPOR-TDU VOA #2 S16T029691 BLNK ¥#

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

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

ample#	œ	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR	3-TDU	VOA #	2						
16T02969	22		3LNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744 SDG Number:

Customer Sample ID: 16-07837-2-BLANK1 Customer Sample ID: 16-07837-2-BLANK1

	-	A00000000			Retention Time	200000		
ample#	R	# QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-1	DU VOA	1 #2		200				
316T029693	-	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

Cartridge Evaluation Data Summary Report

Sample Group: 20162744 SDG Number:

Customer Sample ID: 16-07837-2-BLANK2 Customer Sample ID: 16-07837-2-BLANK2

					Detection Time			
Sample# R	## **	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TC	# NOV U	12						
S16T029694		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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	*	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T029695			Unknown-1	1	8.25	NGS	TC 65	T.
S16T029695			Formamide	75-12-7	14.07	NGS	35	35 JNT
S16T029695			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	250 JNT	JNT
S16T029695			D-Limonene	5989-27-5	22.61	NGS	130 JNT	JNT
S16T029695			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	FNL 88	JNT
S16T029695			2,6-Dimethyldecane	13150-81-7	23.11	NGS	32	32 JNT
S16T029695			Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	09	TNL 09
S16T029695			Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	78	TNL 87
S16T029695			Unknown-2		24.23	NGS	330 JT	JT
S16T029695			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	TNL 04	TNC
S16T029695			1,2-Benzisothiazole	272-16-2	26.34	NGS	130 JNT	JNT
S16T029695			Unknown-3	1	26.43	NGS	TL 57	TC.
S16T029695			1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	27	27 JNT
S16T029695			Undecane, 2-methyl-	7045-71-8	27.01	NGS	35	35 JNT
S16T029695	Ĩ	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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	#W	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	4 VO	2						
S16T029696			Formamide	75-12-7	14.09	NGS	64	64 JNT
S16T029696			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	190	190 JNT
S16T029696			D-Limonene	5989-27-5	22.61	NGS	100	100 JNT
S16T029696			Decane, 2,4,6-trimethyl-	62108-27-4	22.98	NGS	89	TNL 89
S16T029696			2,6-Dimethyldecane	13150-81-7	23.12	NGS	25	25 JNT
S16T029696			Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	48	48 JNT
S16T029696			3,3-Dimethylhexane	563-16-6	23.92	NGS	44	44 JNT
S16T029696			Unknown-1		24.22	NGS	Z60 JT	75
S16T029696			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	36	36 JNT
S16T029696			Acetic acid, trifluoro-, 3,7-d	28745-07-5	25.40	NGS	25	25 JNT
S16T029696			Unknown-2	1	26.00	NGS	34 JT	17
S16T029696			Methenamine	100-97-0	26.22	NGS	27	27 JNT
S16T029696			1,2-Benzisothiazole	272-16-2	26.34	NGS	100	100 JNT
S16T029696			Unknown-3	î	26.43	NGS	42 JT	TC
S16T029696	Г		Propanoic acid, 2-methyl-, 1-(74381-40-1	26.57	NGS	41	TNC
S16T029696			Undecane, 2-methyl-	7045-71-8	27.01	NGS	25	25 JNT
S16T029696		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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	¥¥	ac Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	10A#	2						
S16T029697			Unknown-1	1	8.25	NGS	31 JT	TL
S16T029697			Formamide	75-12-7	14.10	NGS	FNL 88	TNI
S16T029697			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	120 JNT	TNL
S16T029697			Cyclohexene, 1-methyl-5-(1-met	1461-27-4	22.61	NGS	TNL 67	TNL
S16T029697			Decane, 2,4,6-trimethyl-	62108-27-4	22.98	NGS	TNL 45 JNI	TNL
S16T029697			Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	31 JNT	TNL
S16T029697			Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	TNL 18	TNL
S16T029697			Unknown-2		24.22	NGS	720 JT	TI
S16T029697			Undecane, 2,6-dimethyl-	17301-23-4	25.26	NGS	JNL 36	TNL
S16T029697			Methenamine	100-97-0	26.23	NGS	130 JNT	TNI
S16T029697			1,2-Benzisothiazole	272-16-2	26.35	NGS	TNL 88	TNL
S16T029697			Propanoic acid, 2-methyl-, 1-(74381-40-1	26.58	NGS	TNL 14	TNL
S16T029697	Ĺ	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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	#∀	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	10A#	12						
S16T029698			Methyl formate	107-31-3	4.73	NGS	31	31 JNT
S16T029698			Unknown-1	1	8.27	NGS	42 JT	17
S16T029698			Formamide	75-12-7	14.09	NGS	54	54 JNT
S16T029698			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	81	TNL
S16T029698			D-Limonene	5989-27-5	22.61	NGS	75	TNL 37
S16T029698			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	48	48 JNT
S16T029698			Undecane, 5,7-dimethyl-	17312-83-3	23.82	NGS	29	29 JNT
S16T029698			Heptane, 2,4,6-trimethyl-	2613-61-8	23.91	NGS	29	29 JNT
S16T029698			Unknown-2		24.22	NGS	TL 091	ΤL
S16T029698			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	17	TNL 71
S16T029698			Methenamine	100-97-0	26.20	NGS	180	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	TNL 71
S16T029698		BLNK	1.1.1.3.5.5.7.7.Nonamethyl-3	38146-99-5	25.25	NGS	30	

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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	# X	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #							
S16T029699			Methyl formate	107-31-3	4.72	NGS	43	43 JNT
S16T029699			Unknown-1	1	8.29	NGS	41 JT	Τſ
S16T029699			Formamide	75-12-7	14.10	NGS	56	56 JNT
S16T029699			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	52	TNL
S16T029699			D-Limonene	5989-27-5	22.61	NGS	41	TNL
S16T029699			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	23	23 JNT
S16T029699			Unknown-2	1	24.22	NGS	100	JT
S16T029699			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	13	13 JNT
S16T029699			Methenamine	100-97-0	26.20	NGS	120	TNC
S16T029699			1,2-Benzisothiazole	272-16-2	26.32	NGS	42	JNL
S16T029699			Propanoic acid, 2-methyl-, 1-(74381-40-1	26.54	NGS	140	140 JNT
S16T029699		BLNK	1.1.1.3.5.5.7.7.7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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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

Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162744

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

Sample# R	# V	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	12						
S16T029700			Methyl formate	107-31-3	4.72	NGS	41 JNT	INT
S16T029700			Unknown-1	1	8.23	NGS	40 JT	П
S16T029700			Formamide	75-12-7	14.07	NGS	TNL 38	TNI
S16T029700			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	54 JNT	INT
S16T029700			D-Limonene	5989-27-5	22.61	NGS	31 J	JNT
S16T029700			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	21 J	TNC
S16T029700			Unknown-2	1	24.22	NGS	100	T)
S16T029700			Methenamine	100-97-0	26.19	NGS	140 JNT	INT
S16T029700			1,2-Benzisothiazole	272-16-2	26.32	NGS	46 JNT	INT
S16T029700			Propanoic acid, 2-methyl-, 1-(74381-40-1	26.53	NGS	TNL 87	INT
S16T029700		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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	#W	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	42	1772					
S16T029701			Methyl formate	107-31-3	4.72	NGS	26	26 JNT
S16T029701			Di(1,2,5-oxadiazolo)[3,4-b;3,4	186205-18-5	5.76	NGS	36	36 JNT
S16T029701			Formamide	75-12-7	14.18	NGS	35	35 JNT
S16T029701			Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	94	94 JNT
S16T029701			Heptane, 2,4-dimethyl-	2213-23-2	17.28	NGS	130	130 JNT
S16T029701			Octane, 3-chloro-	1117-79-9	17.67	NGS	34	34 JNT
S16T029701			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	210 JN1	TNL
S16T029701			1-Hexanol, 2-ethyl-	104-76-7	21.99	NGS	31	31 JNT
S16T029701			D-Limonene	5989-27-5	22.61	NGS	72	72 JNT
S16T029701			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	250 JNT	TNC
S16T029701			2,6-Dimethyldecane	13150-81-7	23.12	NGS	26	TNL 76
S16T029701			2,6-Dimethyl-6-trifluoroacetox	61986-67-2	23.47	NGS	38	38 JNT
S16T029701			Undecane, 5,7-dimethyl-	17312-83-3	23.83	NGS	140	140 JNT
S16T029701			3,3-Dimethylhexane	563-16-6	23.93	NGS	28	58 JNT
S16T029701			Unknown-1	. 1	24.22	NGS	130	ΤĽ
S16T029701			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	22	22 JNT
S16T029701		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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

mple# R	#₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	5						
16T029702			Methyl formate	107-31-3	4.72	NGS	1NL 63	TNC
16T029702			Unknown-1		8.28	NGS	36 JT	5
16T029702			Formamide	75-12-7	14.11	NGS	19 JNT	TNI
16T029702			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	TNL 88	TNL
16T029702			D-Limonene	5989-27-5	22.60	NGS	31	JNT
16T029702			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	18	TNL 81
16T029702			Unknown-2		24.22	NGS	TL 97	5
16T029702			Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	TNL 0.6	INT
16T029702			Methenamine	100-97-0	26.21	NGS	130 JNT	INT
16T029702			1,2-Benzisothiazole	272-16-2	26.33	NGS	32 JNT	TNI
16T029702		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

NA = Not Analyzed, ND = Not Detected

J - Estimated
E - Outside Calibration Range

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative

a - LCS Outside Range T - Tentatively Identified Compound

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	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	A #2	10 10 10 10 10 10					
16T029703		Di(1,2,5-oxadiazolo)[3,4-b;3,4	186205-18-5	5.24	NGS	34	34 JNT
16T029703		Methoxytrimethylsilane	1825-61-2	8.69	NGS	99	56 JNT
16T029703		Tetrahydrofuran	109-99-9	11.97	NGS	13	13 JNT
16T029703		Ethylene Glycol	107-21-1	13.94	NGS	120 JNT	JNI
S16T029703		Oxirane, 2,3-dimethyl-, cis-	1758-33-4	14.17	NGS	250 JNT	JNT
S16T029703		Unknown-1		14.40	NGS	JL 78	T,
16T029703		Propane, 2-methyl-1-nitro-	625-74-1	16.54	NGS	64	64 JNT
16T029703		Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	110 JNT	JNT
16T029703		Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	410 JNT	JNT
S16T029703		D-Limonene	5989-27-5	22.61	NGS	120 JNT	JNT
S16T029703		Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	140	140 JNT
S16T029703		2,6-Dimethyldecane	13150-81-7	23.11	NGS	90	50 JNT
16T029703		Undecane, 5,7-dimethyl-	17312-83-3	23.82	NGS	86	W JNT
16T029703		3,3-Dimethylhexane	563-16-6	23.92	NGS	83	83 JNT
S16T029703		Unknown-2		24.22	NGS	360 JT	Tr.
S16T029703		Undecane, 2,6-dimethyl-	17301-23-4	25.25	NGS	49	49 JNT
S16T029703		Ethanol, 2-phenoxy-	122-99-6	25.82	NGS	54	54 JNT
16T029703		1,2-Benzisothiazole	272-16-2	26.34	NGS	62	62 JNT
16T029703		Octane, 2,3,6,7-tetramethyl-	52670-34-5	26.43	NGS	55	55 JNT
16T029703		Unknown-3		26.56	NGS	45 JT	JT
S16T029703		1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	38	38 JNT
S16T029703		Undecane, 2-methyl-	7045-71-8	27.01	NGS	31	31 JNT
S16T029703	BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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-TDL	J VOA #	2						
S16T029704		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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

QC Type #W Sample# R S16T029705

30 NGS 25.25 38146-99-5 1,1,1,3,5,5,7,7,7-Nonamethyl-3 BLNK

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

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

					Retention Time			
Sample# R	A#	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags
VAPOR-TDL	U VOA #	12						
S16T029706		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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

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Sample#	œ	##	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR	Y UQT-	OA #2				W			
S16T029707		В	ILNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

NA = Not Analyzed, ND = Not Detected

N - Named TIC Q - Qualitative

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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

ample#	~	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-	TDU VC	DA #2						
316T029708		BLNK	1,1,1,3,5,5,7,7,7-Nonamethyl-3	38146-99-5	25.25	NGS	30	

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

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

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

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

a - LCS Outside Range T - Tentatively Identified Compound

Y - Comment U - Less Than Detection Limit

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T029710			Di(1,2,5-oxadiazolo)[3,4-b;3,4	186205-18-5	7.66	NGS	43 JNT	INT
S16T029710			Tetrahydrofuran	109-99-9	11.98	NGS	10 JNT	TNI
S16T029710			4,8-Dioxatricyclo[5.1.0.0(3,5)	42569-59-5	14.17	NGS	51	TNC
S16T029710			Formamide	75-12-7	14.59	NGS	TNL 08	INI
S16T029710			Acetonitrile, hydroxy-	107-16-4	16.25	NGS	30 JNT	INT
S16T029710			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	TNL 79	TNI
S16T029710			Cyclohexene, 1-methyl-4-(1-met	7705-14-8	22.60	NGS	TNL 62	TNI
S16T029710			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	TNL 81	TNI
S16T029710			Unknown-1	1	24.22	NGS	72 BJT	3JT
S16T029710			Unknown-2		25.85	NGS	36 J	П
S16T029710	<u></u>	BLNK	Unknown-1		8.25	NGS	22	
S16T029710	_	BLNK	Unknown-2	,	24.23	NGS	30	

NA = Not Analyzed, ND = Not Detected

J - Estimated E - Outside Calibration Range

Y - Comment U - Less Than Detection Limit

N - Named TIC Q - Qualitative

a - LCS Outside Range T - Tentatively Identified Compound

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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	% dTS	Blank	Result	Result Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Flags
VAPOR-TDU VOA #2	U VOA #2												
S16T029715	79-34-5	1,1,2,2-Tetrachioroethane	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	66	<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	e/u	1.7	UaU	
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	92	n/a	n/a	n/a	n/a	3.0	n/a	
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	u/a U	
S16T029715	591-78-6	2-Hexanone	NGS	96	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a J	
S16T029715	534-22-5	2-Methylfuran	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U	ĺ
S16T029715	78-94-4	3-Buten-2-one	NGS	88	<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	98	<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	86	<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	
S16T029715	75-05-8	Acetonitrile	NGS	88	14	510	n/a	n/a	n/a	n/a	1.8	n/a BE	
S16T029715	98-86-2	Acetophenone	NGS	94	<2.6	25	n/a	n/a	n/a	n/a	2.6	n/a	
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	U/a U	

L - LLS Outside Range E - Outside Calibration Range

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Y - Comment B - Blank Contamination

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J - Estimated T - Tentatively Identified Compound

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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	Chrit	% als	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	I VOA #2				la l				1			
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	SDN	110	<2.1	3.2	n/a	n/a	n/a	n/a	2.1	n/a J
S16T029715	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029715	56-23-5	Carbon tetrachloride	SDN	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	67-66-3	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
S16T029715	64-17-5	Ethanol	NGS	110	4.7>	55	n/a	n/a	n/a	e/u	7.4	n/a
S16T029715	141-78-6	Ethyl acetate	SDN	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	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029715	110-54-3	Hexane	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029715	628-73-9	Hexanenitrile	SDN	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029715	126-98-7	Methacrylonitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029715	75-09-2	Methylene Chloride	NGS	86	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	Pentanenitrile	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	86	4.1>	<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
S16T029715	108-88-3	Toluene	NGS	100	<1.5	2.1	n/a	n/a	n/a	n/a	1.5	1/2/1

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Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162851

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDI	U 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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029715	142-82-5	n-Heptane	NGS	96	4.1.4	4.1>	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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U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	R A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T029716	79-34-5	1,1,2,2-Tetrachloroethane	SON	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a U
S16T029716	9-00-64	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	66	<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	
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
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	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	
S16T029716	78-94-4	3-Buten-2-one	NGS	88	<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	. 62	<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	86	<1.9	<1.9	n/a	n/a	e/u	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
S16T029716	75-05-8	Acetonitrile	NGS	88	14	550	n/a	n/a	n/a	n/a	1.8	n/a BE
S16T029716	98-86-2	Acetophenone	NGS	94	<2.6	29	n/a	n/a	n/a	n/a	2.6	n/a
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

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

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J - Estimated T - Tentatively Identified Compound

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Cartridge Evaluation Data Summary Report

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

Sample# R	A# CAS#	Analyte	Cuit	% QLS	Blank	Result	Duplicate	Average	KPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	42.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a U
S16T029716	109-74-0	Butanenitrile	NGS	86	<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	41.6	<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	in/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	L s/u
S16T029716	67-66-3	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
S16T029716	64-17-5	Ethanol	NGS	110	4.7>	150	n/a	n/a	n/a	n/a	7.4	n/a
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	100414	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	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029716	110-54-3	Hexane	NGS	26	<1.7	2.6	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029716	628-73-9	Hexanenitrile	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029716	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029716	75-09-2	Methylene Chloride	NGS	86	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	Pentanenitrile	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	86	<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	nya 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
S16T029716	108-88-3	Toluene	NGS	100	<1.5	2.9	n/a	n/a	n/a	n/a	1.5	1/8/1

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

NA = Not Analyzed, ND = Not Detected

J - Estimated T - Tentatively Identified Compound

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	R A# CAS#	AS#	Analyto	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD % Spk Rec %	k Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TD	NO VOA	#2												
S16T029716	17	79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	_
S16T029716	1	75-69-4	Trichlorofluoromethane	NGS	100	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	
S16T029716	F	10061-01-5	cls-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a L	_
S16T029716	-	123-86-4	n-Butyl acetate	NGS	83	4.1>	41.4	n/a	n/a	n/a	n/a	4.1	n/a	_
S16T029716	-	142-82-5	n-Heptane	NGS	96	4.1.4	4.1>	n/a	n/a	n/a	n/a	1.4	n/a	_
S16T029716	7	0061-02-6	trans-1,3-Dichloropropene	NGS	100	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a L	_

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J - Estimated T - Tentatively Identified Compound

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	2-00-62	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	66	<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	п/а	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	28	e/u	n/a	n/a	n/a	3.0	n/a
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	96	<1.9	8.6	e/u	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	98	<1.2	1.8	n/a	n/a	n/a	n/a	1.2	n/a J
S16T029717	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	4.0	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029717	106-35-4	3-Heptanone	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029717	106-68-3	3-Octanone	NGS	98	<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	96	<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	86	<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
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
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	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	I 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	42.1	<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	L e/u
S16T029717	67-66-3	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	e/u	n/a	n/a	n/a	2.8	n/a
S16T029717	64-17-5	Ethanol	NGS	110	4.7>	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	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029717	110-54-3	Hexane	NGS	26	<1.7	2.2	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029717	628-73-9	Hexanenitrile	NGS	66	<1.5	<1,5	n/a	n/a	n/a	n/a	1,5	n/a U
S16T029717	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029717	75-09-2	Methylene Chloride	NGS	88	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	Pentanenitrile	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	86	<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/alJ

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD % Spk Rec %	Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U 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	4.12	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029717	142-82-5	n-Heptane	NGS	96	4.12	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	12	n/a []

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L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

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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	% QLS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	66	<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-Dichtoropropene (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	<4.7	<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
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	98	<1.9	6.2	n/a	n/a	n/a	n/a	1.9	ויא ל
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	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029718	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	2.0	n/a	n/a	e/u	n/a	1.7	n/a J
S16T029718	106-35-4	3-Heptanone	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029718	106-68-3	3-Octanone	NGS	92	<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	98	<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	86	<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
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
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	118/11

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NA = Not Analyzed, ND = Not Detected Estimated

J - Estimated T - Tentatively Identified Compound

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %		Det Limit Cnt Err % Qual Flags	Flags
VAPOR-TDU VOA #2	J 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	Γ
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	86	<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		
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	9.0	n/a	n/a	n/a	n/a	1.9		
S16T029718	67-66-3	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	41.8	n/a	n/a	n/a	n/a	1.8	n/a U	
S16T029718	124-18-5	Decane	NGS	8	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a	
S16T029718	64-17-5	Ethanol	NGS	110	4.7×	270	n/a	n/a	n/a	n/a	7.4	n/a	
S16T029718	141-78-6	Ethyl acetate	SDN	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	46	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	Ua 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	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029718	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U	
S16T029718	75-09-2	Methylene Chloride	NGS	86	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	88-95-3	Nitrobenzene	NGS	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U	
S16T029718	110-59-8	Pentanenitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	Ua/u	
S16T029718	107-12-0	Propanentrile	NGS	86	<1.4	5.5	n/a	n/a	n/a	n/a	1.4	u/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	
S16T029718	108-88-3	Toluene	NGS	100	<1.5	2.5	n/a	n/a	n/a	n/a	1.5	- eju	

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Cartridge Evaluation Data Summary Report

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

Sample# R	A# CAS#	Analyte	Unit	% ats	Blank	Result	Duplicate	Average	Average RPD % Spk Rec %	k Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	41.6	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	4.1>	4.12	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029718	142-82-5	n-Heptane	NGS	96	4.1>	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	12	n/a U

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
VAPOR-TDU VOA #2	1 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	2-00-62	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	66	<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	<4.7	n/a	n/a	n/a	n/a	1.7	u/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	
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	92	<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	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	u/a U	
S16T029719	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U	
S16T029719	106-35-4	3-Heptanone	NGS	36	<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	98	<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	86	<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	066	n/a	n/a	n/a	n/a	1.8	n/a BE	100
S16T029719	98-86-2	Acetophenone	NGS	94	<2.6	- 17	n/a	n/a	n/a	n/a	2.6	n/a	
S16T029719	107-13-1	Acrylonitrile	NGS	94	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	Ua 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

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

Sample# R	A# CAS#	Analyte	Cult	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	41.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a U
S16T029719	123-72-8	Butanal	NGS	110	<2.1	42.1	n/a	n/a	n/a	n/a	2.1	n/a U
S16T029719	109-74-0	Butanenitrile	NGS	86	<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	22-00-3	Chloroethane	NGS	100	<1.9	8.6	n/a	n/a	n/a	n/a	1.9	l, a/n
S16T029719	67-66-3	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	41.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029719	124-18-5	Decane	NGS	96	<2.8	8.4	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029719	64-17-5	Ethanol	NGS	110	4.7×	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	16	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029719	110-54-3	Hexane	NGS	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029719	628-73-9	Hexanenitrile	NGS	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029719	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029719	75-09-2	Methylene Chloride	NGS	86	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	Pentanenitrile	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	86	<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	1.6/4

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#		Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	Average RPD % Spk Rec %	Rec %	Det Limit Cr	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VC	J 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		frichlorofluoromethane	NGS	100	<1.6	18	n/a	n/a	n/a	n/a	1.6	n/a
S16T029719	10061-01-5	01-5	sis-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	4	n-Butyl acetate	NGS	83	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029719	142-82-5	5	Heptane	NGS	96	<1.4	4.12	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029719	10061-02-6	9-20	rans-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

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Flags
VAPOR-TDU VOA #2	1 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	2-00-62	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	66	<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	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	U/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	U/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	U/a U	
S16T029720	71-36-3	1-Butanol	NGS	130	6.8>	99	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	
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	98	<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	U/a U	
S16T029720	591-78-6	2-Hexanone	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	Ua U	
S16T029720	534-22-5	2-Methylfuran	NGS	66	<1.9	<1,9	n/a	n/a	n/a	n/a	1.9	U/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	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U	
S16T029720	106-68-3	3-Octanone	NGS	92	<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	96	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	U/a U	
S16T029720	108-10-1	4-Methyl-2-Pentanone	NGS	88	<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	-
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	6.6	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	Alivi Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	11 6/0	

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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 %	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	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	SDN	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	SDN	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a U
S16T029720	109-74-0	Butanenitrile	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029720	56-23-5	Carbon tetrachloride	SDN	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	67-66-3	Chloroform	SSN	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	9.6	e/u	n/a	n/a	n/a	2.8	n/a J
S16T029720	64-17-5	Ethanol	SDN	110	47.4	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	U/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	26	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029720	110-54-3	Hexane	NGS	26	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029720	628-73-9	Hexanenitrile	SDN	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029720	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029720	75-09-2	Methylene Chloride	SDN	86	3.9	2.8	n/a	n/a	n/a	n/a	2.7	n/a BJ
S16T029720	91-20-3	Naphthalene	SON	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	Pentanenitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029720	107-12-0	Propanenitrile	SDN	86	<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	SDN	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 K	4.5	0/0	-1-	-1-	-1-		

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Y - Comment B - Blank Contamination

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	% ats	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	U 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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029720	142-82-5	n-Heptane	NGS	96	4.1>	4.1>	n/a	n/a	n/a	n/a	4.1	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	Cult	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	I 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	2-00-64	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	66	<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	41.6	×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	92	<1.9	2.4	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029721	110-43-0	2-Heptanone	SON	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	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U
S16T029721	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a U
S16T029721	106-35-4	3-Heptanone	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029721	106-68-3	3-Octanone	NGS	96	<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	98	<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	86	<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	η	n/a	1.8	n/a BE
S16T029721	98-86-2	Acetophenone	NGS	94	<2.6	0.9	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

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	850 %	RPD % Spk Rec %	Det LIMIT	Det Limit Cnt Ert % Qual Flags
VAPOR-TDU VOA #2	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	e/u	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	86	<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	L/a J
S16T029721	124-18-5	Decane	NGS	98	<2.8	17	n/a	n/a	n/a	n/a	2.8	n/a
S16T029721	64-17-5	Ethanol	NGS	110	4.7>	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	п/а	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	26	<1.6	<1.6	e/u	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	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029721	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029721	75-09-2	Methylene Chloride	NGS	86	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	Pentanenitrile	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	86	<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

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
VAPOR-TDU VOA #2	U 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	5
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	5
S16T029721	123-86-4	n-Butyl acetate	NGS	83	4.1>	41.4	n/a	n/a	n/a	n/a	1.4	n/a l	_
S16T029721	142-82-5	n-Heptane	NGS	96	4.1>	4.12	n/a	n/a	n/a	n/a	1.4	n/a	_
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 L	ס

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Cartridge Evaluation Data Summary Report

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

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate /	Average	RPD % S	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	1 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	2-00-64	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	66	<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	<1.2	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	9.5>	<5.6	n/a	n/a	n/a	n/a	9.6	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
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	98	<1.9	230	n/a	n/a	n/a	n/a	1.9	n/a
S16T029722	110-43-0	2-Heptanone	NGS	96	<1.6	34	n/a	n/a	n/a	n/a	1.6	n/a
S16T029722	591-78-6	2-Hexanone	NGS	98	<1.2	27	n/a	n/a	n/a	n/a	1.2	n/a
S16T029722	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	13	n/a	n/a	n/a	n/a	1.7	n/a
S16T029722	106-35-4	3-Heptanone	NGS	98	<1.5	210	n/a	n/a	n/a	n/a	1.5	n/a
S16T029722	106-68-3	3-Octanone	NGS	98	<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	98	<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	88	<1.9	2.0	n/a	n/a	n/a	n/a	1.9	n/a J
S16T029722	67-64-1	Acetone	NGS	87	<4.3	3.5E+03	n/a	n/a	n/a	n/a	4.3	n/a E
\$167029722	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

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2											
S16T029722	107-05-1	Allyl Chloride	NGS	91	<2.8	<2.8	n/a	n/a	n/a	e/u	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	86	<1.2	27	e/u	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	u/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	98	<2.8	2.9	n/a	n/a	n/a	n/a	2.8	n/a J
S16T029722	64-17-5	Ethanol	NGS	110	4.7.4	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	26	<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	66	<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	.u/a	n/a	n/a	n/a	1.6	n/a U
S16T029722	75-09-2	Methylene Chloride	NGS	88	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	Pentanenitrile	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	86	4.1>	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

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

Sample Group: 20162851

Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Qual Flags 1.6 1.4 1.4 n/a n/a n/a n/a n/a 110 6.9 4.13 Blank <1.5 <1.6 <1.4 5 5 5 8 STD % 98 00 NGS NGS NGS NGS Unit trans-1,3-Dichloropropene cis-1,3-Dichloropropene n-Butyl acetate Trichlorofluoromethane Trichloroethene n-Heptane Analyte 142-82-5 10061-01-5 123-86-4 79-01-6 Sample# R A# CAS# VAPOR-TDU VOA #2 16T029722 S16T029722 S16T029722 S16T029722 S16T029722 16T029722

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L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

C.201

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J 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	2-00-62	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	66	<1.2	<1.2	n/a	n/a	n/a	e/u	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	560	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
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	e/u	n/a	n/a	n/a	2.8	n/a U
S16T029723	78-93-3	2-Butanone	NGS	98	<1.9	350	n/a	n/a	n/a	n/a	1.9	n/a
S16T029723	110-43-0	2-Heptanone	NGS	96	<1.6	61	n/a	n/a	n/a	n/a	1.6	n/a
S16T029723	591-78-6	2-Hexanone	NGS	95	<1.2	25	n/a	n/a	n/a	n/a	1.2	n/a
S16T029723	534-22-5	2-Methylfuran	NGS	66	<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	88	<1.7	16	n/a	n/a	n/a	n/a	1.7	n/a
S16T029723	106-35-4	3-Heptanone	NGS	96	<1.5	350	n/a	n/a	n/a	n/a	1.5	n/a
S16T029723	106-68-3	3-Octanone	NGS	92	<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	96	<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	86	<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	890	n/a	n/a	n/a	n/a	1.8	n/a BE
S16T029723	28-86-2	Acetophenone	NGS	94	<2.6	33	n/a	n/a	n/a	n/a	2.6	n/a
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

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	-	RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
VAPOR-TDU VOA #2	J VOA #2								4			
S16T029723	107-05-1	Allyl Chloride	NGS	16	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a U
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	SDN	110	<2.1	16	n/a	n/a	n/a	n/a	2.1	n/a
S16T029723	109-74-0	Butanenitrile	NGS	86	<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	98	<2.8	14	n/a	n/a	n/a	n/a	2.8	n/a
S16T029723	64-17-5	Ethanol	NGS	110	4.7>	420	n/a	n/a	n/a	n/a	7.4	n/a
S16T029723	141-78-6	Ethyl acetate	SON	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	26	<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	66	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029723	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029723	75-09-2	Methylene Chloride	NGS	86	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	Pentanenitrile	NGS	96	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a J
S16T029723	107-12-0	Propanenitrile	NGS	86	4.1>	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	L'e/u

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Cartridge Evaluation Data Summary Report

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

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #	U 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	4.1>	4.1>	n/a	n/a	n/a	n/a	1.4	n/a U
S16T029723	142-82-5	n-Heptane	NGS	96	<1.4	4.1>	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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C.204

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit Cnt Err % Qual Flags	Cut Err % C	ual Flags
VAPOR-TDU VOA #2	1 VOA #2												
S16T029730	79-34-5	1,1,2,2-Tetrachloroethane	SDN	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a U	
S16T029730	5-00-64	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	66	<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 L	
S16T029730	107-06-2	1,2-Dichloroethane	NGS	110	<1.6	41.6	n/a	n/a	n/a	n/a	1.6	n/a L	
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 L	
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 L	
S16T029730	71-36-3	1-Butanol	NGS	130	<8.9	85	n/a	n/a	n/a	n/a	8.9	rı/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 L	7
S16T029730	71-23-8	1-Propanol	NGS	120	<3.0	95	n/a	n/a	n/a	n/a	3.0	n/a	
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	98	<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	96	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a U	
S16T029730	534-22-5	2-Methylfuran	NGS	66	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	
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	
S16T029730	106-35-4	3-Heptanone	NGS	98	<1.5	18	n/a	n/a	n/a	n/a	1.5	n/a	
S16T029730	106-68-3	3-Octanone	NGS	36	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a L	
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	86	<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	ш
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	11/2	

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDU VOA #2	I 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	86	<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	41.6	<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	rva 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	41.8	n/a	n/a	n/a	n/a	1.8	n/a U
S16T029730	124-18-5	Decane	NGS	94	<2.8	42.8	n/a	n/a	n/a	n/a	2.8	n/a U
S16T029730	64-17-5	Ethanol	NGS	110	<7.4	610	n/a	n/a	n/a	n/a	7.4	n/a
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	16	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029730	110-54-3	Hexane	NGS	26	<4.7	2.6	n/a	n/a	n/a	n/a	1.7	n/a J
S16T029730	628-73-9	Hexanenitrile	NGS	66	<1.5	<1,5	n/a	n/a	n/a	n/a	1.5	n/a U
S16T029730	126-98-7	Methacrylonitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a U
S16T029730	75-09-2	Methylene Chloride	NGS	86	3.9	9.0	n/a	n/a	n/a	n/a	2.7	n/a BJ
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	SDN	96	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a U
S16T029730	110-59-8	Pentanenitrile	NGS	96	<1.6	<1.6	n/a	n/a	e/u	n/a	1.6	n/a U
S16T029730	107-12-0	Propanenitrile	SDN	86	4.1>	37	n/a	n/a	n/a	n/a	1.4	n/a
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	41.6	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
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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L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

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

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Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851

Sample# R	A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
VAPOR-TDL	U 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	4.1>	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	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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L - LLS Outside Range E - Outside Calibration Range

U - Less Than Detection Limit N - Named TIC

Sample Group: 20162851 SDG Number:

Cartridge Evaluation Data Summary Report

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

Sample# R	₩	QC Type	Analyte	CAS No.	(Minutes)	Unit	Result	Qual Flags	
VAPOR-TDU VOA #2	VOA #	12							_
S16T029715			2-Propanol, 2-methyl-	75-65-0	7.15	NGS	27	Z7 JNT	
S16T029715			Acetic acid	64-19-7	9:28	NGS	43	43 JNT	
S16T029715			Formamide	75-12-7	14.07	NGS	30	30 JNT	
S16T029715			Propanoic acid, 2,2-dimethyl-	75-98-9	16.50	NGS	33	33 JNT	
S16T029715			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	120 JNT	TNC	
S16T029715			2,2,7,7-Tetramethyloctane	1071-31-4	21.49	NGS	31	31 JNT	
S16T029715			D-Limonene	5989-27-5	22.61	NGS	130	130 JNT	_
S16T029715			3-Ethyl-3-methylheptane	17302-01-1	22.98	NGS	66	TNL 66	
S16T029715			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	44	44 JNT	
S16T029715			Heptanoic acid, 2-ethyl-	3274-29-1	23.69	NGS	100	100 JNT	
S16T029715			Undecane	1120-21-4	23.83	NGS	71	TUL 17	_
S16T029715			Undecane, 5,7-dimethyl-	17312-83-3	23.93	NGS	46	46 JNT	_
S16T029715			Unknown-1	1	24.23	NGS	330 JT	JT	_
S16T029715			Undecane, 3-methyl-	1002-43-3	24.88	NGS	6.5	6.5 JNT	_
S16T029715			Dodecane	112-40-3	25.25	NGS	41	41 JNT	
S16T029715			Methenamine	0-26-001	26.21	NGS	80	TNL 08	_
S16T029715			Benzothiazole	95-16-9	26.33	NGS	110	110 JNT	
S16T029715			Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	59	59 JNT	_
S16T029715			Tridecane	629505	26.57	NGS	15	15 JNT	_
S16T029715			Unknown-2	5	26.61	NGS	38	38 JT	_
S16T029715			Tetradecane	629-59-4	26.99	NGS	35	35 JNT	_

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U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	/0A#	5						
S16T029716			2-Propanol, 2-methyl-	75-65-0	7.15	NGS	909	50 JNT
S16T029716			Acetic acid	64-19-7	9:55	NGS	34	34 JNT
S16T029716			Formamide	75-12-7	14.09	NGS	909	50 JNT
S16T029716			Propanoic acid, 2,2-dimethyl-	75-98-9	16.52	NGS	51	51 JNT
S16T029716			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	140	140 JNT
S16T029716			D-Limonene	5989-27-5	22.61	NGS	130	130 JNT
S16T029716			2,6-Dimethyldecane	13150-81-7	22.97	NGS	100	100 JNT
S16T029716			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	39	39 JNT
S16T029716			Heptanoic acid, 2-ethyl-	3274-29-1	23.68	NGS	120	120 JNT
S16T029716			Undecane	1120-21-4	23.83	NGS	83	83 JNT
S16T029716			Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	72	72 JNT
S16T029716			Unknown-1	ì	24.22	NGS	320 JT	T,
16T029716		10	Undecane, 3-methyl	1002433	24.88	NGS	11	11 JNT
S16T029716			Dodecane	112-40-3	25.25	NGS	20	50 JNT
S16T029716			2-Propenoic acid, octyl ester	2499-59-4	25.40	NGS	29	Z9 JNT
S16T029716			Unknown-2	1	26.00	NGS	46 JT	JT
S16T029716			Ethylene diacrylate	2274-11-5	26.03	NGS	26	26 JNT
S16T029716			Benzothiazole	95-16-9	26.34	NGS	140	140 JNT
S16T029716			Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	28	64 JNT
S16T029716			Dodecane, 2,6,11-trimethyl-	31295-56-4	26.55	NGS	20	20 JNT
S16T029716		:9	Tridecane	629505	26.58	NGS	17	TNL 71
S16T029716	ī		1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.63	NGS	34	34 JNT
S16T029716			Tetradecane	629594	27.01	NGS	36	36 JNT

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L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

U - Less Than Detection Limit N - Named TIC

C.209

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	/OA#	2						
S16T029717			2-Propanol, 2-methyl-	15-65-0	7.14	NGS	90	FOL JNT
S16T029717			Acetic acid	64-19-7	9.44	NGS	19	TNL 91
S16T029717			Formamide	75-12-7	14.08	NGS	62	62 JNT
16T029717			Propanoic acid, 2,2-dimethyl-	75-98-9	16.51	NGS	44	44 JNT
S16T029717			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	130 JNT	JNT
S16T029717			D-Limonene	5989-27-5	22.61	NGS	120 JNT	JNT
S16T029717			3-Ethyl-3-methylheptane	17302-01-1	22.97	NGS	93	93 JNT
S16T029717			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	34	34 JNT
S16T029717			Hexanoic acid, 2-ethyl-	149-57-5	23.68	NGS	86	TNL 86
S16T029717			Undecane	1120-21-4	23.83	NGS	74	74 JNT
S16T029717			Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	63	63 JNT
S16T029717			Undecane, 2-methyl-	7045718	24.04	NGS	19	TNL 61
S16T029717			Unknown-1	1	24.22	NGS	340 JT	T.
S16T029717			Undecane, 3-methyl-	1002433	24.88	NGS	TNL 8.7	TNC
S16T029717			Dodecane	112-40-3	25.25	NGS	62	62 JNT
S16T029717			2-Propenoic acid, octyl ester	2499-59-4	25.99	NGS	30	30 JNT
S16T029717			Benzothiazole	95-16-9	26.33	NGS	TNL 021	JNT
S16T029717			Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	54	54 JNT
S16T029717			Tridecane	629505	26.57	NGS	31	31 JNT
S16T029717			1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	38	38 JNT
S16T029717			Tetradecane	629594	27.00	NGS	30	30 JNT

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L - LLS Outside Range E - Outside Calibration Range

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	Oual Flags
VAPOR-TDU VOA #2	VOA #	12						L
S16T029718			Cyclobutylamine	2516-34-9	5.30	NGS	81	NT INT
S16T029718			2-Propanol, 2-methyl-	75-65-0	7.15	NGS	44	TNC 44
S16T029718			Acetic acid	64-19-7	9.45	NGS	18	18 JNT
S16T029718			Formamide	75-12-7	14.09	NGS	53	53 JNT
S16T029718			Propanoic acid, 2,2-dimethyl-	75-98-9	16.51	NGS	38	39 JNT
S16T029718			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	TNL 011	INT
S16T029718			Cyclohexene, 1-methyl-5-(1-met	1461-27-4	22.61	NGS	120 JNT	JNT
S16T029718			2,6-Dimethyldecane	13150-81-7	22.97	NGS	TNL 56	JNT
S16T029718			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	TNL 35	TNC
S16T029718			Heptanoic acid, 2-ethyl-	3274-29-1	23.68	NGS	120 JNT	TNC
S16T029718			Undecane	1120-21-4	23.83	NGS	TNL 08	JNT
S16T029718			Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	61	61 JNT
S16T029718			Undecane, 2-methyl-	7045718	24.04	NGS	ZZ JNT	TNL
S16T029718			Unknown-1		24.22	NGS	Z80 JT	15
S16T029718			Undecane, 3-methyl-	1002-43-3	24.88	NGS	TNL 6.5 JNT	TNC
S16T029718			Dodecane	112-40-3	25.25	NGS	TNL 33	TNC
S16T029718			Benzothiazole	95-16-9	26.34	NGS	02	TNL 07
S16T029718			Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	S2 JNT	TNC
S16T029718			Dodecane, 2,6,11-trimethyl-	31295-56-4	26.55	NGS	TNL 18	TNL
S16T029718			Unknown-2		26.62	NGS	TL 78	5
S16T029718			Dodecane, 2,6,10-trimethyl-	3891983	26.74	NGS	1NC 8.7	TNC
S16T029718			Tetradecane	629594	27.01	NGS	33 JNT	TNL

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L - LLS Outside Range E - Outside Calibration Range

U - Less Than Detection Limit N - Named TIC

Y - Comment B - Blank Contamination

C.211

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	VOA #	12						
S16T029719			Acetic anhydride	108-24-7	5.28	NGS	11	TNL 77
S16T029719			2-Propanol, 2-methyl-	75-65-0	7.15	NGS	28	28 JNT
S16T029719			Formamide	75-12-7	14.09	NGS	53	53 JNT
S16T029719			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	89	68 JNT
S16T029719			D-Limonene	5989-27-5	22.61	NGS	81	NT 18
S16T029719			2,6-Dimethyldecane	13150-81-7	22.97	NGS	54	54 JNT
S16T029719			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	20	ZO JNT
S16T029719			1-Undecene, 4-methyl-	74630-39-0	23.76	NGS	5.9	5.9 JNT
S16T029719			Undecane	1120214	23.76	NGS	5.9 JNT	JNT
S16T029719			Undecane, 4,7-dimethyl-	17301-32-5	23.83	NGS	41	41 JNT
S16T029719			Undecane, 5,7-dimethyl-	17312-83-3	23.93	NGS	31	31 JNT
S16T029719			Undecane, 2-methyl-	7045718	24.04	NGS	11	11 JNT
S16T029719			Unknown-1		24.22	NGS	Z00 JT	75
S16T029719			Dodecane	112-40-3	25.25	NGS	29	29 JNT
S16T029719			Methenamine	100-97-0	26.22	NGS	10	10 JNT
S16T029719			Benzothiazole	95-16-9	26.33	NGS	110 JNT	JNT
S16T029719			Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	42	42 JNT
S16T029719			Propanoic acid, 2-methyl-, 2,2	74367-33-2	26.57	NGS	39	39 JNT
S16T029719			Unknown-2	ï	26.61	NGS	31 JT	15
S16T029719			Dodecane, 2,6,10-trimethyl-	3891983	26.73	NGS	8.2	8.2 JNT
S16T029719			Tetradecane	629594	27.00	NGS	24	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	Ą	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	VOA #	12						
S16T029720			Methyl formate	107-31-3	4.72	NGS	43	43 JNT
S16T029720			Unknown-1	1	8.28	NGS	49 JT	77
S16T029720			Formamide	75-12-7	14.10	NGS	48	48 JNT
S16T029720			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	51	51 JNT
S16T029720			D-Limonene	5989-27-5	22.61	NGS	52	52 JNT
\$167029720			2,6-Dimethyldecane	13150-81-7	22.97	NGS	40	40 JNT
S16T029720			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	15	15 JNT
S16T029720			Hydroxylamine, O-decyl-	29812-79-1	23.71	NGS	33	33 JNT
S16T029720			Undecane, 4,6-dimethyl-	17312-82-2	23.82	NGS	40	40 JNT
S16T029720			Undecane, 5,7-dimethyl-	17312-83-3	23.92	NGS	36	36 JNT
S16T029720			Undecane, 2-methyl-	7045718	24.04	NGS	14	14 JNT
S16T029720			Unknown-2	1	24.22	NGS	TL 061	JT
S16T029720			Undecane, 3-methyl-	1002433	24.88	NGS	5.8	5.8 JNT
S16T029720			Dodecane	112-40-3	25.25	NGS	34	34 JNT
S16T029720			2-Propenoic acid, octyl ester	2499-59-4	25.99	NGS	35	35 JNT
S16T029720			Methenamine	100-97-0	26.21	NGS	74	74 JNT
S16T029720			Benzothiazole	95-16-9	26.34	NGS	96	94 JNT
S16T029720			Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	33	33 JNT
S16T029720			Dodecane, 2,6,11-trimethyl-	31295564	26.73	NGS	6.3	6.3 JNT
S16T029720			Tetradecane	629594	27.00	NGS	19	TNL 91

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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

Qual Flags 43 JNT 56 JNT 37 JNT TNL 86 39 JNT 150 JNT 26 JNT 58 JNT 33 JNT 62 JNT 110 JNT 30 JNT 53 JNT 35 JNT 54 JNT 250 JNT FOL JNT 20 JNT FINC 69 28 JNT 260 JNT 390 JNT 110 JNT 110 JNT 8.5 JNT 56 JT 200 57 Resuft NGS Retention Time (Minutes) 20.43 22.89 23.11 23.55 23.71 17.02 17.28 18.09 23.83 24.04 24.88 26.56 52670-34-5 17302-01-1 13151-34-3 13151-99-0 7312-44-6 17301-32-5 2213-23-2 62108-27-4 13151-98-9 17312-54-8 104-76-7 5989-27-5 17312-83-3 2216-34-4 556-67-2 120-21-4 61141728 1002-43-3 541-05-9 149-57-5 107-31-3 112-40-3 31295564 CAS No. 75-12-7 Octane, 4-methyl-Cyclotetrasiloxane, octamethyl Cyclooctane, 1,4-dimethyl-, tr Cyclooctane, 1,4-dimethyl-, ci Cyclotrisiloxane, hexamethyl-Octane, 2,3,6,7-tetramethyl-Dodecane, 2,6,11-trimethyl-3-Ethyl-3-methylheptane Undecane, 5,7-dimethyl-Jndecane, 4,7-dimethyl-Decane, 2,4,6-trimethyl-Dodecane, 4,6-dimethyl-Hexanoic acid, 2-ethylleptane, 2,4-dimethyl-Decane, 3,7-dimethyl-2,3-Dimethyldecane Undecane, 3-methyl-1-Hexanol, 2-ethyl-Decane, 3-methyl-Octane, 3-chloro-Methyl formate O-Limonene Unknown-1 Formamide Unknown-2 Undecane Dodecane Analyte QC Type VAPOR-TDU VOA #2 \$ œ 16T029721 16T029721 S16T029721 S16T029721 16T029721 16T029721 16T029721 16T029721 S16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 167029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721 16T029721

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

J - Estimated

NA = Not Analyzed, ND = Not Detected

T - Tentatively Identified Compound

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162851 SDG Number:

			diam'r.	Canada Calling 12: 10: 10: 10: 10: 10: 10: 10: 10: 10: 10					
Sample#	8	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-	TDU VC	OA #2							
S16T029721		-		Tetradecane	629594	27.02	NGS	16	F JNT

NA = Not Analyzed, ND = Not Detected

J - Estimated T - Tentatively Identified Compound

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2	OA#	2						
S16T029722			Methyl formate	107-31-3	4.72	NGS	64	64 JNT
S16T029722			4-Methoxy-1-pentene	98386-09-5	7.15	NGS	32 JNT	JNT
S16T029722			Acetic anhydride	108-24-7	7.46	NGS	38	38 JNT
S16T029722			Tetrahydrofuran	109-99-9	11.98	NGS	TNL 8.7	TNL
S16T029722			Formamide	75-12-7	14.11	NGS	TNL 09	JNL
S16T029722			2-Pentanone	107-87-9	14.17	NGS	TNL 45 JNT	TNE
S16T029722			Neopentane	463-82-1	15.76	NGS	TNL 19	JNT
S16T029722			Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	64	64 JNT
S16T029722			D-Limonene	5989-27-5	22.61	NGS	26	26 JNT
S16T029722			2,6-Dimethyldecane	13150-81-7	22.97	NGS	TNL 25 JNT	TNC
S16T029722			Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	TNL 01	JNT
S16T029722			Undecane, 4,7-dimethyl-	17301-32-5	23.82	NGS	Z5 JNT	JNT
S16T029722	Г		Unknown-1	,	24.22	NGS	110 JT	JT
S16T029722			Dodecane	112403	25.25	NGS	TNL 31	TNL
S16T029722			Unknown-2		25.86	NGS	26 JT	JT
S16T029722			Methenamine	100-97-0	26.21	NGS	130 JNT	JNT
\$167029722			Benzothiazole	95-16-9	26.33	NGS	TNL 64	TNC
S16T029722			Dodecane, 4,6-dimethyl-	61141728	26.42	NGS	14	14 JNT
S16T029722			Tetradecane	629594	27.00	NGS	8.6 JNT	JNT

NA = Not Analyzed, ND = Not Detected

L - LLS Outside Range E - Outside Calibration Range

U - Less Than Detection Limit N - Named TIC

Cartridge Evaluation Data Summary Report

SDG Number:

Sample Group: 20162851

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	1 #2						
316T029723		Methyl formate	107-31-3	4.72	NGS	77	TNL 17
S16T029723		2-Propanol, 2-methyl-	75-65-0	7.16	NGS	100	100 JNT
S16T029723		Methyl Acetate	79-20-9	7.46	NGS	41	41 JNT
S16T029723		Acetic acid	64-19-7	9.65	NGS	40	40 JNT
316T029723		Tetrahydrofuran	109-99-9	11.98	NGS	9.3	9.3 JNT
S16T029723		2-Pentanone	107-87-9	14.17	NGS	150	150 JNT
S16T029723		Cyclopentanol	96-41-3	14.40	NGS	35	35 JNT
S16T029723		Neopentane	463-82-1	15.76	NGS	77	TNL 77
\$167029723		Propanoic acid, 2,2-dimethyl-	75-98-9	16.54	NGS	55	55 JNT
S16T029723		Cyclotrisiloxane, hexamethyl-	541-05-9	17.02	NGS	62	62 JNT
S16T029723		4-Heptanone	123-19-3	18.32	NGS	30	30 JNT
S16T029723		Cyclotetrasiloxane, octamethyl	556-67-2	20.43	NGS	190	TNL 061
S16T029723		2,2,7,7-Tetramethyloctane	1071-31-4	21.49	NGS	8	34 JNT
S16T029723		1-Hexanol, 2-ethyl-	104-76-7	21.99	NGS	31	31 JNT
S16T029723		D-Limonene	5989-27-5	22.61	NGS	110	110 JNT
S16T029723		3-Ethyl-3-methylheptane	17302-01-1	22.97	NGS	100	100 JNT
S16T029723		Decane, 2,4,6-trimethyl-	62108-27-4	23.11	NGS	46	46 JNT
S16T029723		Hexanoic acid, 2-ethyl-	149-57-5	23.69	NGS	110	110 JNT
S16T029723		Undecane, 4,7-dimethyl-	17301-32-5	23.82	NGS	98	94 JNT
S16T029723		Undecane, 5,7-dimethyl-	17312-83-3	23.91	NGS	09	TNL 09
S16T029723		Unknown-1	1	24.22	NGS	J 270 JT	77
16T029723		Undecane, 3-methyl-	1002433	24.88	NGS	7.4	7.4 JNT
S16T029723		Dodecane	112-40-3	25.25	NGS	35	35 JNT
S16T029723		Ethanol, 2-phenoxy-	122-99-6	25.82	NGS	36	36 JNT
S16T029723		Methenamine	100-97-0	26.22	NGS	. 60	TNL 09
16T029723		Benzothiazole	95-16-9	26.34	NGS	47	47 JNT
S16T029723		Dodecane, 4,6-dimethyf-	61141728	26.43	NGS	35	35 JNT

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

Y - Comment B - Blank Contamination

NA = Not Analyzed, ND = Not Detected

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#	A# QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Result Qual Flags
VAPOR-TDI	# YOA F	2						
S16T029723			1,2,3,4,5-Cyclopentanepentol	56772-25-9	26.62	NGS	28 JNT	IN
S16T029723			Tetradecane	629594	27.01	NGS	18	INT

NA = Not Analyzed, ND = Not Detected

J - Estimated T - Tentatively Identified Compound

U - Less Than Detection Limit N - Named TIC

L - LLS Outside Range E - Outside Calibration Range

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	₩	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Oual Flags
VAPOR-TDU VOA #2	VOA #	2						
S16T029730			Methyl formate	107-31-3	4.72	NGS	48	48 JNT
S16T029730			Formamide	75-12-7	14.10	NGS	25	54 JNT
S16T029730			D-Limonene	5989-27-5	22.61	NGS	31	JNL
S16T029730			Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	8.7	JNT
S16T029730			Undecane	1120-21-4	23.82	NGS	1NL 8.6 JNT	JNT
S16T029730			Unknown-1		24.22	NGS	TL 97	5
S16T029730		35.0	Dodecane	112403	25.25	NGS	1NL 9.9	JNT
S16T029730			Unknown-2		25.87	NGS	TL 88	75
S16T029730			Methenamine	100-97-0	26.22	NGS	140 JNT	JNL
S16T029730			Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	16	TNL 91
S16T029730			Tetradecane	629505	27.02	NGS	TNL 0.0	TNC

NA = Not Analyzed, ND = Not Detected

J - Estimated T - Tentatively Identified Compound

L - LLS Outside Range E - Outside Calibration Range

U - Less Than Detection Limit N - Named TIC

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

Sample Group: 20162749 SDG Number:

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

Cartridge Evaluation Data Summary of All Results

A S	A# CAS#	Analyte	Unit	CTD %	Blank	Rosult	Ounlicate	Average	70 UGG	DDD 9. Cat Dag 9/	Date Charles		
1	1			210 %	WIND I	Incom	Cupincate	afiguate	200	ops nec 7	Det LIMIT	Det Limit ont err % Qual Flags	Qual Flags
rurans in vapor samples by SIM	M												
1191-99-7 2,3-Dihydrofuran	2,3-Dihydr	ofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a L	2
1708-29-8 2,5-Dihydrofuran	2,5-Dihydr	ofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a U	ס
625-86-5 2,5-Dimet	2,5-Dimet	Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	-	0
3777-71-7 2-Heptylfuran	2-Heptylfu	ran	NGS	130	>0.86	<0.86	n/a	n/a	n/a	n/a	0.86		2
534-22-5 2-Methylfuran	2-Methylfu	ıran	NGS	98	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		2
3777-69-3 2-Pentylfuran		an	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90		0 0
4229-91-8 2-Propylfuran	2-Propylfu	ran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62		1
110-00-9 Furan	Furan		NGS	7.1	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		10
109-99-9 Tetrahydrofuran	Tetrahydr	ofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U	2
									1				1200

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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

Sample# R A# CAS	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit Co	Det Limit Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SI	MIS										
S16T029770	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	11/2/11
S16T029770	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	2/2	0.33	116/0
S16T029770	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	2/0	0.75	0 10
S16T029770	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	2/2	0.86	11 6/0
S16T029770	534-22-5	2-Methylfuran	NGS	98	<0.46	0.48	n/a	n/a	n/a	2/0	0.00	0 000
S16T029770	3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	2/2	0/0	0/0	000	1100
S16T029770	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	6/4	p/a	0.90	0/2/11
S16T029770	110-00-9	Furan	NGS	77	<0.37	<0.37	n/a	n/a	6/4	n/a	0.37	1 0/0
S16T029770	109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	e/u	n/a	0.23	110/0
											2000	0 000

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-BLANK1
Customer Sample ID: 16-07837-3-BLANK1

	THE CAS #	and instance.	OHIE	2010	Allong	Kesuit	Duplicate	Average	KPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SIM	MI										
S16T029771	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	Il stu
S16T029771	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	2/0	0.33	1 6/0
S16T029771	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	r/a	6/0	0.75	110/0
S16T029771	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	1/2	6/0	0.86	118/0
S16T029771	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	n/a	10/0	0.46	11/2/0
S16T029771	3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	e/u	n/a	2 6/2	0.00	11 6/0
S16T029771	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	2/2	0.62	118/0
S16T029771	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	1/3	0.37	D'all
S16T029771	109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	2/2	0.23	118/0

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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

Sample# R	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in Val	Furans in Vapor Samples by SIM	y SIM									TOTAL STREET	
S16T029772	1191-99-7	7 2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	11/2/11
S16T029772	1708-29-8	3 2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a		0.33	
S16T029772	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a		0.75	
S16T029772	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a		0.86	
S16T029772	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	2/0	n/a	0.46	110/0
S16T029772	3777-69-3	2-Pentyffuran	NGS	120	<0.90	<0.90	n/a	n/a	6/0	6/4	08.0	116/0
S16T029772	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	0/2
S16T029772	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	
S16T029772	109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	
											20000	-

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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Sample Group: 20162749
SDG Number:
Customer Sample ID: 16-07837-3-EFF-A
Customer Sample ID: 16-07837-3-EFF-A
Implet R | A# | CAS # | Analyte

Sample# R A# CAS#	*	CAS#	Analyte	Unit	% dTS	Blank	Result	Duplicate	Average	RPD % Spk Rec %	pk Rec %	Det Limit	Cnt Err % Qual Flags	ual Flags
Furans in Va	por	Furans in Vapor Samples by SIM	M											
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 I	
S16T029773		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	e/u	2/0	0.33	o la	
S16T029773		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	6/4	6/0	0.75	11/2	
S16T029773		3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	u/a	2/4	6/4	0.86	0 1	
S16T029773		534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	6/4	n/a	0/0	cla	0.00	0 0	
S16T029773		3777-69-3	2-Pentyifuran	NGS	120	06.0>	06.0>	2/4	0,0	0/0	0 0	2	0 1	
S16T029773		4229-91-8	2-Propyffuran	NGS	110	<0.62	<0.62	2/9	n/a	0/2	n/a	08.0	1/2 0	
S16T029773		110-00-9	Furan	NGS	7.1	<0.37	<0.37	n/a	n/a	2/2	2/2	0.37	1 6/0	
S16T029773		109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	1/3	n/a	0.23	n spo	
												2000	O man	

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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Customer Sample ID: 16-07837-3-EFF-B
Customer Sample ID: 16-07837-3-EFF-B
R | A# | Cas # | Analyte

							and a			2000		South and	dual Flags
Furans in Va	Furans in Vapor Samples by SI	NIS											
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 I	
S16T029774	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.41	n/a	n/a	n/a	n/a	0.33		
S16T029774	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	1/2	0.75		
S16T029774	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	0/2	6/4	0.86		
S16T029774	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	6/4	e/u	0.46		
S16T029774	3777-69-3	2-Pentylfuran	NGS	120	<0.90	0.98	n/a	6/4	2/2	2 0	0.00		
S16T029774	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	e/u	n/a	0.50		
S16T029774	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		
S16T029774	109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23		

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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

n/a n/a n/a	Sample# R	\$	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
1191-99-7 2,3-Dihydrofuran NGS 74 <0.23 <0.23 n/a n/a n/a n/a n/a 0.23 1708-29-8 2,5-Dihydrofuran NGS 170 <0.75	Furans in V.	apor	Samples by S	W										
1708-29-8 2,5-Dihydrofuran NGS 87 <0.33 0.43 rula rula </td <td>S16T029775</td> <td>L</td> <td>1191-99-7</td> <td>2,3-Dihydrofuran</td> <td>NGS</td> <td>74</td> <td><0.23</td> <td><0.23</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>n/a</td> <td>0.23</td> <td>n/a ti</td>	S16T029775	L	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a ti
625-86-5 2,5-Dimethylfuran NGS 100 <0.75 <0.75 n/a n/a n/a n/a n/a n/a 0.75 3777-71-7 2-Heptylfuran NGS 130 <0.86	S16T029775	L	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.43	n/a	n/a	n/a	2/4	0.33	1 6/0
3777-71-7 2-Heptyfluran NGS 130 <0.86 <0.86 n/a n/a n/a 0.86 534-22-5 2-Methyfluran NGS 120 <0.46	S16T029775		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	2/2	0.75	11 6/0
534-22-5 2-Methylfuran NGS 86 <0.46 <0.46 n/a n/a n/a n/a 0.46 3777-69-3 2-Pentylfuran NGS 120 <0.90	S16T029775		3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	0 11 10
3777-69-3 2-Pentylfuran NGS 120 <0.90 <0.90 n/a	S16T029775		534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	0/8	n/a	0.46	112/0
4229-91-8 2-Propylfuran NGS 110 <0.62 <0.62 n/a	S16T029775		3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	0/0	2/4	n/a	000	11 6/4
110-00-9 Furan NGS 71 <0.37 71	S16T029775		4229-91-8	2-Propyifuran	NGS	110	<0.62	<0.62	n/a	e/u	6/0	n/a	0,00	110/0
109-99-9 Tetrahydrofuran NGS 88 <0.23 <0.23 n/a	S16T029775	L	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	2/2	0/9	0.37	0/3 []
	S16T029775		109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	e/u	n/a	n/a	n/a	0.23	116/4

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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

Sample# R	*	CAS#	Analyte	Unit	% QTS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
Furans in V.	apor S	Furans in Vapor Samples by SI	MIS											,
S16T029776	Ì	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	_
S16T029776		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	0.37	n/a	n/a	n/a	n/a	0.33		
S16T029776	9	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		
S16T029776	10	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86		
S16T029776	47	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	6/4	n/a	0.46		
S16T029776	(5)	3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	6/0	6/4	080		
S16T029776	4	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	6/0	6/4	6/4	0.62		
S16T029776	Ĺ	110-00-9	Furan	NGS	77	<0.37	<0.37	n/a	2/2	n/a	6/4	0.37		
S16T029776	Ĺ	6-66-601	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	8/0	n/a	0.23		

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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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	% ats	Blank	Result	Duplicate	Average	RPD % S	RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags	al Flans
Furans in Va	Furans in Vapor Samples by S	MIS											
S16T029777	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	11 s/u	
S16T029777	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	e/u	1/2	6/4	0.33	1100	
S16T029777	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	6/4	n/a	0/0	0.75	0 11 0/0	T
S16T029777	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	6/0	6/4	6/4	0/0	200	0 11 0/0	
S16T029777	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	cla	0/0	o o	0.00		T
S16T029777	3777-69-3	2-Pentyifuran	NGS	120	06.0>	06.0>	a/a	0/4	0/4	0 0	0.40		
S16T029777	4229-91-8	2-Propyifuran	NGS	110	<0.62	<0.62	n/a	n/a	0/3	0/2	0.90	1180	
S16T029777	110-00-9	Furan	NGS	77	<0.37	<0.37	n/a	n/a	6/4	6/4	0.37	0 11 6/0	T
S16T029777	109-99-9	Tetrahydrofuran	NGS	88	<0.23	0.25	n/a	n/a	n/a	n/a	0.23	0 1 6/0	T
												o na	

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

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

Sample# K	R AW CAS#	Analyte	Cult	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SII	SIM										
S16T029778	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	lls/u
S16T029778	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	p/a	0.33	118/4
S16T029778	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	1/2	0.75	118/4
S16T029778	7-17-7778	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	1/3	0.86	118/0
S16T029778	534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	0/2/11
S16T029778	3777-69-3	2-Pentyifuran	NGS	120	<0.90	<0.90	n/a	n/a	n/a	n/a	080	116/0
S16T029778	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	e/u	0.62	0/8/1
S16T029778	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	2/2	0.37	118/0
S16T029778	109-99-9	Tetrahydrofuran	NGS	88	<0.23	<0.23	n/a	n/a	n/a	n/a	0 23	0/9 [1

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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

R Att CA

Furans in Vapor Samples by SIM S16T029780 1191-99-7 2,3-Dihydrofuran NGS 74 <0.23	Sample# R	\$	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
1191-99-7 2,3-Dihydrofuran NGS 74 <0.23 <0.23 n/a n/a n/a n/a n/a 0.23 1708-29-8 2,5-Dihydrofuran NGS 100 <0.75	Furans in V	/apor	Samples by S	WI										
1708-29-8 2,5-Dihydrofuran NGS 87 <0.33 <0.33 n/a n/a n/a n/a n/a 0.33 625-86-5 2,5-Dimethyfluran NGS 100 <0.75	S16T029780	L	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	<0.23	n/a	n/a	n/a		0.23	
625-86-5 2,5-Dimethylfuran NGS 100 <0.75 <0.75 n/a n/a n/a n/a 0.75 3777-71-7 2-Heptylfuran NGS 130 <0.86	S16T029780		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	1/3	n/a		0.33	
3777-71-7 2-Heptyfluran NGS 130 <0.86 <0.86 n/a n/a n/a 0.86 534-22-5 2-Methyfluran NGS 120 <0.46	S16T029780		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	0/3		0.75	
534-22-5 2-Methylluran NGS 86 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.46 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47 <0.47	S16T029780			2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	2/4		0.86	
3777-89-3 2-Pentylfuran NGS 120 <0.90 n/a n/a n/a n/a n/a 0.90 4229-91-8 2-Propylfuran NGS 110 <0.62	S16T029780		534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	n/a	nla	2/2		0.00	
4229-91-8 2-Propylfuran NGS 110 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62 <0.62	S16T029780	L	3777-69-3	2-Pentylfuran	NGS	120	06.0>	06.0>	6/0	n/a	0/4		00.0	
110-00-9 Furan NGS 71 <0.37 <0.37 r/a r/a	S16T029780	1		2-Propylfuran	NGS	110	<0.62	<0.62	6/0	1/3	0/2		0.90	
109-99-9 Tetrahydrofuran NGS 88 < 0.23 1.1 n/a	S16T029780	L	110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a		0.37	
	S16T029780	L	109-99-9	Tetrahydrofuran	NGS	88	<0.23	1.1	n/a	n/a	n/a		0.23	

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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

Sample# R	₩	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags
Furans in Va	apor	Furans in Vapor Samples by SI	W										D. C.
S16T029781		1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.1	n/a	n/a	n/a	n/a	0.03	1 6/4
S16T029781		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	6/0	0.33	116/0
S16T029781		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	1/2/11
S16T029781		3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	10/2	0.86	116/0
S16T029781		534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	0/2	n/a	0.46	1100
S16T029781		3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	2/2	6/4	0 0	0/2
S16T029781		4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a	e/u	0.62	0 000
S16T029781		110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	0/9 []
S16T029781		109-99-9	Tetrahydrofuran	NGS	88	<0.23	9.8	n/a	n/a	n/a	n/a	0.23	0/8

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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

Sample# R	\$	R A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	Qual Flags
Furans in V	'apor	Furans in Vapor Samples by S	MI											
S16T029782		1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.3	n/a	n/a	6/4	e/u	0.23	c/a	
S16T029782		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	6/0	6/0	0.33	l c/u	
S16T029782		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	0/2	e/u	0.75	0/0	
S16T029782		3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	2/0	6/4	0.86	10/4	
S16T029782		534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	2/2	c/c	0.46	0/4	
S16T029782	L	3777-69-3	2-Pentyfuran	NGS	120	08.0>	00 00	2/0	0,0	2/4	0/4	9	100	
S16T029782	-	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	0/2	2/2	p/a	BVI c/a	0.90	IVa I	
S16T029782		110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	0/2	2/2	0.37	10/0	
S16T029782		109-99-9	Tetrahydrofuran	NGS	88	<0.23	12	n/a	n/a	2/3	2/4	0.23	0/4	
												0.40	200	

U - Less Than Detection Limit

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Cartridge Evaluation Data Summary of All Results

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

Sample# K	K A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit C	Det Limit Cut Err % Qual Flaos
Furans in Va	Furans in Vapor Samples by SI	W SIM										0
S16T029783	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	2.1	n/a	n/a	n/a	6/0	0.03	I ola
S16T029783	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	6/0		0 33	110/0
S16T029783	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	e)u		32.0	o on
S16T029783	3777-71-7	2-Heptylfuran	NGS	130	<0.86	×0.86	n/a	o/u	0/0	o of	200	0 1
S16T029783	534-22-5	2-Methylfuran	NGS	88	<0.46	<0.46	2/2	of o	0/4	001	0.00	na o
S46T020783	3777.60.3	2 Booth firms	0014	00,	000	200	001	- Ind	ING	II/S	0.40	n/a u
2010201010	0-20-1110	z-reniyilaran	NGS	071	<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	1/2 []
S16T029783	110-00-9	Furan	NGS	7.1	<0.37	<0.37	n/a	n/a	n/a		0.37	11 6/4
S16T029783	109-99-9	Tetrahydrofuran	NGS	88	<0.23	11	n/a	n/a	e/u	n/a	0.23	0 0/0
											2000	200

U - Less Than Detection Limit

Cartridge Evaluation Data Summary of All Results

Sample Group: 20162749 SDG Number:

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

Sample# R	\$	R A# CAS#	Analyte	Unit	% CLS	Blank	Result	Duplicate	Average	% Udd	APD % Cat Dag %	Dat I imit	Dot Imit Care and Amira	
	-				200			annound an	$\overline{}$	200	שלים שלה	1	CHET WOLL	rai riags
Furans in V	/apor	Furans in Vapor Samples by S	SIM											
S16T029784		1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	1.6	n/a	n/a	n/a	n/a	0.23	L'all	
S16T029784		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	e/u	0.33	1/2	ĺ
S16T029784	L	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	1/3	6/0	0.75	0/2	
S16T029784		3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/all	
S16T029784		534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	n/a	e/u	0.46	II eln	
S16T029784		3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	1/9	n/a	6/4	080	2 2/2	
S16T029784		4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	6/0	n/a		0.62	11000	
S16T029784		110-00-9	Furan	NGS	71	<0.37	<0.37	n/a	n/a	2/4		0.37		
S16T029784	Ц	109-99-9	Tetrahydrofuran	NGS	88	<0.23	13	n/a	n/a	n/a	n/a	0.23		

06 - Oct - 2016 15:58:55 DSRHardcopyWOLimits 3.0.11b DSR.Jar v. 3.0.12 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
mple# R | A# | CAS # | Analyte

Sample# K	R A# CAS#	Analyte	Cuit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qua
Furans in Vapor Sam	apor Samples by SIM	MIS						1	1			
S16T029785	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	1.7	n/a	n/a	n/a	n/a	0.03	1 0/0
S16T029785	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	2/2	0 33	110/0
S16T029785	625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	2/2	e/u	0.75	0 1
S16T029785	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	2/0	o o	2 0	0 1
S16T029785	534-22-5	2-Methylfuran	NGS	86	<0.46	<0.46	6/2	0/4	cla	D C/G	00.0	0 1
S16T029785	3777-69-3	2-Pentyffuran	NGS	120	00 U>	00 00	0/4	0/4	140	140	0.40	D :
S16T029785	4229-91-8	2-Propylfuran	SSN	130	00.00	00.00	0/0	n/a	n/a	n/a	0.90	n/a n
S16T029785	110-00-9	Furan	NGS	7	<0.37	<0.02	ph of	E/U	n/a	n/a	0.62	n/a n
S16T029785	109-99-9	Tetrahydrofuran	NGS	88	<0.23	47	6/0	2/2	0/4	DAI C/G	0.07	n/a O
									200	on.	0.4.0	ING

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

Sample# K	\$	R A# CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit C	Det Limit Cnt Err % Qual Flags	-lags
Furans in Va	'apor	Furans in Vapor Samples by SIN	MI											
S16T029786	L	1191-99-7	2,3-Dihydrofuran	NGS	74	<0.23	0.94	n/a	n/a	n/a	n/a	0.23	l sta	T
S16T029786		1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a		0.33	11 0/0	T
S16T029786		625-86-5	2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a		0.75	1100	T
S16T029786	L	3777-71-7	2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a		0.86	118/0	T
S16T029786		534-22-5	2-Methylfuran	NGS	98	<0.46	<0.46	n/a	n/a	n/a		0.46	0/211	T
S16T029786		3777-69-3	2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	e/u	8/0		0 0	11 6/0	T
S16T029786	L	4229-91-8	2-Propylfuran	NGS	110	<0.62	<0.62	n/a	n/a	n/a		0.62	1 6/4	T
S16T029786	L	110-00-9	Furan	NGS	7	<0.37	<0.37	n/a	n/a	1/2		0.37	118/0	T
S16T029786	L	109-99-9	Tetrahydrofuran	NGS	88	<0.23	16	n/a	n/a	n/a		0.23	0/9	T
										•				•

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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	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SI	s by SII	>										0
S16T029787	1191-99-7		2,3-Dihydrofuran	NGS	74	<0.23	09.0	n/a	n/a	n/a	n/a	0.23	n/a J
16T029787	1708-29-8		2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a [1
16T029787	625-86-5		2,5-Dimethylfuran	NGS	100	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a []
S16T029787	3777-71-7		2-Heptylfuran	NGS	130	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/all
S16T029787	534-22-5		2-Methylfuran	NGS	88	<0.46	<0.46	n/a	n/a	0/8	1/3	0.46	
S16T029787	3777-69-3		2-Pentylfuran	NGS	120	<0.90	<0.90	n/a	n/a	0/9	n/a	08.0	
S16T029787	4229-91-8		2-Propylfuran	NGS	110	<0.62	<0.62	n/a	0/3	n/a	n/a	0.62	
S16T029787	110-00-9		Furan	NGS	71	<0.37	<0.37	n/a	n/a	6/0	2/4	0.37	
S16T029787	109-99-9	6-0	Tetrahydrofuran	NGS	88	<0.23	21	n/a	n/a	e/u	n/a	0.23	0 0/0

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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

	2	AN CAS#	Analyte	Nun.	STD %	Blank	Result	Duplicate	Average	RPD %	KPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	apor	Furans in Vapor Samples by SII	W										
S16T029788	L	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	98	<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	77	<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	e/u	0.23	n/a

Q - Qualitative

Cartridge Evaluation Data Summary Report

Sample Group: 20162750 SDG Number:

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

Sample# R	A# CAS#	Analyte	Cult	% Q1S	Blank	Result	Duplicate	Average	RPD % Spk Rec %	k Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SIM	y SIM										
S16T029789	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U
S16T029789	1708-29-8	2,5-Dihydrofuran	SDN	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	SON	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a U
\$16T029789	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
\$16T029789	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	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a U
316T029789	109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	11/9/11

U - Less Than Detection Limit

Q - Qualitative

Cartridge Evaluation Data Summary Report

Sample Group: 20162750 SDG Number:

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Vap	Furans in Vapor Samples by SII	IM										
S16T029790	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	U/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	89	<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

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

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Sample Group: 20162750 SDG Number:

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

Sample# R	\$	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Va	apor	Furans in Vapor Samples by SIN	M										
S16T029791		1191-99-7	2,3-Dihydrofuran	NGS	11	<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	89	<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	1)/2 [1]

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

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Sample# R	R A# CAS#	Analyte	Chit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SI	SIM										
S16T029792	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a lu
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 [J
S16T029792	3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	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	89	<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	0.03	n/a U

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

Innite | A# | Cas # | Analyte | Unit

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Sample# R	\$	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	/apor	Furans in Vapor Samples by SI	M										
S16T029793	_	1191-99-7	2,3-Dihydrofuran	NGS	7.7	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/alu
S16T029793		1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	
S16T029793	_	625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	6/4	0.75	
S16T029793		3777-71-7	2-Heptylfuran	NGS	110	<0.86	1.1	n/a	n/a	n/a	10/2	0.86	
S16T029793	_	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	
S16T029793	L	3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.0	n/a	nla	0/9	6/4	060	
S16T029793	L	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	2/2	0.62	
S16T029793	L	110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	6/4	0.37	
S16T029793	_	109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	
												2	

U - Less Than Detection Limit

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up: 20162750

Sample Group: 20162750 SDG Number:

Customer Sample ID: 16-08068-3-EFF-B
Customer Sample ID: 16-08068-3-EFF-B
R | A# | Cas # | IAnalyan

Sample# K	R A# CAS#	Analyte	Unit	% dts	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %		Det Limit Cnt Err % Qual Flag	Qual Flag
Furans in Va	Furans in Vapor Samples by	by SIM											
S16T029794	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/alt	2
S16T029794	1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33		10
S16T029794	625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75		=
S16T029794	3777-71-7	2-Heptylfuran	NGS	110	<0.86	0.87	n/a	n/a	n/a	n/a	0.86		, _
S16T029794	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		, =
S16T029794	3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	1/2	060		=
S16T029794	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	2/2	e/u	0.62		=
S16T029794	110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37		2 =
S16T029794	109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	e/u	0.23) =
											2000	200	,

Cartridge Evaluation Data Summary Report

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

Sample# R A# CAS#	A# CA	S#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Cnt Err %	Det Limit Cnt Err % Qual Flags
Furans in Vapor Samples by S	or San	nples by SII	×											
S16T029795	118	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a	2
S16T029795	17(1708-29-8	2,5-Dihydrofuran	NGS	88	<0.33	99.0	n/a	n/a	n/a	n/a	0.33	n/a	7
S16T029795	62	625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a	2
\$167029795	37.	3777-71-7	2-Heptyffuran	NGS	110	<0.86	1.1	n/a	n/a	n/a	n/a	0.86	n/a	
S16T029795	534	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46		
S16T029795	37.	3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.5	n/a	n/a	n/a	n/a	08.0		-
S16T029795	42%	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	, =
\$167029795	11	10-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a	
S16T029795	100	6-66-60	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	1/3	n/a	n/a	0.23	n/a	

U - Less Than Detection Limit

Sample Group: 20162750 SDG Number:

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

Sample# R	A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average		RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V.	Furans in Vapor Samples by SII	NIS										
S16T029796	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	0.55	n/a	n/a	n/a	n/a	0.23	n/alJ
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	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
S16T029796	3777-71-7	2-Heptyffuran	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	06.0	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	89	<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	118/0

Q - Qualitative

10000

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

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

Sample Group: 20162750 SDG Number:

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Sample# R	# ℃	CAS#	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Vapor Samples by SIN	apor Sa	mples by S	MI										
S16T029797	÷	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/alU
S16T029797	17	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	9	625-86-5	2,5-Dimethylfuran	NGS	16	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a U
S16T029797	3.	3777-71-7	2-Heptylfuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a U
S16T029797	5,	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	0/3 [1]
S16T029797	3.	3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a/n
S16T029797	¥	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	1/3	0.62	118/0
S16T029797	E	110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	1/3	0/9	0/3	0.37	0/3
S16T029797	Ĕ	109-99-9	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	1 8/0

Cartridge Evaluation Data Summary Report

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Sample	Grou	Sample Group: 20162750	0											
SDG Number:	MnN	ber:												
Cus	tom	Customer Sample II	ID: 16-08068-3-EFF-F											
ű	usto	Customer Sample	e ID: 16-08068-3-EFF-F											
Sample# R	8	R A# CAS#	Analyte	Unit	% drs	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags	
Furans in	Vapo	Furans in Vapor Samples by SIM	IIM											Т
S16T029798	H	1191-99-7	2,3-Dihydrofuran	NGS	11	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/alu	Т
S16T029798	Н	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	Т
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	Т
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	Т
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	Т
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	Т
S16T029798	-	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/alu	T
S16T029798		110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a U	T
S16T029798	-	109-99-9	Tetrahydrofuran	NGS	35	<0.23	<0.23	n/a	n/a	n/a	n/a	0.23	n/a U	Т
														1

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

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

Sample# R	#	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Result Duplicate	Average	RPD %	Average RPD % Spk Rec %		Det Limit Cnt Err % Qual Flags
Furans in Vapor Samples t	por S	amples by SI	MI										
S16T029799	_	1191-99-7	2,3-Dihydrofuran	NGS	111	<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	9	625-86-5	2,5-Dimethylfuran	NGS	91	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	
S16T029799	3	3777-71-7	2-Heptyifuran	NGS	110	<0.86	0.87	n/a	n/a	n/a	n/a	0.86	
S16T029799	2	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	3	3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.2	n/a	n/a	n/a	n/a	06.0	L'e/u
S16T029799	4	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	٢	110-00-9	Furan	NGS	89	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a U
S16T029799	-	6-66-60	Tetrahydrofuran	NGS	92	<0.23	<0.23	n/a	2/3	n/a	e/u	0.23	n/a I I

Cartridge Evaluation Data Summary Report

Sample Group: 20162750

SDG Number:

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

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

Result Duplicate Average RPD % Spk Rec % Det Limit Cnt Err % Quai Flags 0.23 0.75 0.76 0.90 0.90 0.37 1.9 <0.33 <0.75 <0.86 <0.90 <0.62 F <0.33 <0.86 <0.90 <0.62 Blank <0.23 % QLS 5 8 8 8 2 91 88 NGS NGS NGS NGS NGS Unit 2,5-Dimethylfuran 2,3-Dihydrofuran 2,5-Dihydrofuran Tetrahydrofuran 2-Methylfuran 2-Pentylfuran 2-Heptylfuran 2-Propylfuran Analyte ple# R A# CAS# Ar Furans in Vapor Samples by SIM 1191-99-7 534-22-5 3777-69-3 1708-29-8 3777-71-7 4229-91-8 625-86-5 110-00-9 109-99-9 \$16T029800 \$16T029800 S16T029800 S16T029800 \$16T029800 \$16T029800 16T029800 S16T029800 S16T029800

n/a U

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20162750 SDG Number:

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

Sample# R	A# CAS#	Analyte	Unit	% drs	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cut Err % Qual Flags	Qual Flags
Furans in V	Furans in Vapor Samples by SI	MI											
S16T029801	1191-99-7	2,3-Dihydrofuran	NGS	11	<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 L	
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 L	
S16T029801	3777-71-7	2-Heptyffuran	NGS	110	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a l	
S16T029801	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a L	
S16T029801	3777-69-3	2-Pentylfuran	NGS	110	<0.90	1.2	n/a	n/a	n/a	n/a	06.0	L'a/u	
S16T029801	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a	
S16T029801	110-00-9	Furan	NGS	89	<0.37	1.5	n/a	n/a	n/a	n/a	0.37	L'a/u	
S16T029801	109-99-9	Tetrahydrofuran	NGS	92	<0.23	9.2	n/a	n/a	n/a	n/a	0.23	e/a	

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20162750 SDG Number:

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

Sample# K	K A# CAS#	# S*	Analyte	Cuit	STD %	Blank	Result	Duplicate	Average	RPD % Spk Rec %	ok Rec %	Det Limit C	Det Limit Cnt Err % Qual Flags
Furans in Vapor Samples by SIN	por San	nples by SI	W										
S16T029802	118	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	171	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	62	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	37.	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	53	534-22-5	2-Methylfuran	NGS	82	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a II
S16T029802	37.	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	42	4229-91-8	2-Propylfuran	NGS	96	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a [1]
S16T029802	=	110-00-9	Furan	NGS	89	<0.37	1.6	n/a	n/a	n/a	n/a	0.37	n/a.l
S16T029802	10	109-99-9	Tetrahydrofuran	NGS	92	<0.23	8.9	n/a	n/a	n/a	n/a	0.23	r/a

Q - Qualitative

Cartridge Evaluation Data Summary Report

Cartrid Sample Group: 20162750 SDG Number: Customer Sample ID: 16-08068-3-IN-D Customer Sample ID: 16-08068-3-IN-D

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Sample# R	₩	A# CAS#	Analyte	Unit	% ats	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags	ual Flags
Furans in V	apor	Furans in Vapor Samples by S	MI											
S16T029804		1191-99-7	2,3-Dihydrofuran	NGS	75	<0.23	1.2	n/a	n/a	n/a	n/a	0.23	n/a JQ	_
S16T029804	L	1708-29-8	2,5-Dihydrofuran	NGS	87	<0.33	<0.33	n/a	n/a	n/a	n/a	0.33	n/a QU	5
S16T029804		625-86-5	2,5-Dimethyffuran	NGS	88	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a QU	2
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 QL	5
S16T029804		3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	06.0	n/a U	
S16T029804		4229-91-8	2-Propyifuran	NGS	98	<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 QU	5
S16T029804		109-99-9	Tetrahydrofuran	NGS	92	<0.23	9.4	e/u	n/a	6/4	n/a	0.03	Osla	

U - Less Than Detection Limit

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

Sample# R	₩ 0	AS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in Vapor Samples by SII	por Sa	amples by SI	W										
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	9	625-86-5	2,5-Dimethylfuran	NGS	88	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a U
S16T029805	3	3777-71-7	2-Heptyffuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a U
S16T029805	5	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	3	3777-69-3	2-Pentyffuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a U
S16T029805	4	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	¥.	6-66-601	Tetrahydrofuran	NGS	92	<0.23	14	n/a	n/a	n/a	n/a	0.23	n/a
									-				

U - Less Than Detection Limit

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

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Sample# R	₩	CAS#	Analyte	Unit	% aus	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	Det Limit	Det Limit Cnt Err % Qual Flags
Furans in V	/apor	Furans in Vapor Samples by SI	WI										
S16T029806	L	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	88	<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	35	<0.23	14	n/a	n/a	n/a	e/u	0.23	n/a

U - Less Than Detection Limit

21 - Nov - 2016 15:26:34 DSRHardcopyWOLimits 3.0.13 DSR.Jar v. 3.0.12 Cartridge Evaluation Data Summary Report

Data Summ

Sample Group: 20162750 SDG Number: Customer Sample ID: 16-08068-3-IN-G Customer Sample ID: 16-08068-3-IN-G Customer Sample ID: 16-08068-3-IN-G Sample						חמום	Data Sullillally Nepoli	Nepolit.						
LOS Number: Customer Sample ID: 16-08068-3-IN-G Customer Sample ID: 16-08068-3-IN-G R Analyte Digital Analyte Digital Analyte	Sample G	Srou	p: 2016275	c				71						
Customer Sample ID: 16-08068-3-IN-G R A# CAS# Analyte Init STD % Blank Result Duplicate Average RPD % Spk Rec % B007 Analyte Analyte Init STD % Blank Result Duplicate Average RPD % Spk Rec % B007 Analyte An	SDG N	dum!	er:											
R Acas# Analyte Unit STD % Blank Result Duplicate Average RPD % Spk Roc % Ansl in Yapor Samples by SIM Analyte 1191-99-7 23-Dihydrofuran NGS 75 <0.23	Cust	tome	er Sample II	D: 16-08068-3-IN-G										
1191-99-7 2,3-Dihydrofuran NGS 75 <0,23 1,8 n/a n/		₩.	CAS#		Unit	STD %	Blank	Result	Duplicate		RPD %	Spk Rec %	Det Limit	Cnt Err % Qual Flags
1191-99-7 2,3-Dihydrofuran NGS 75 <0.23 1,8 n/a n/a n/a n/a n/a 0.23 1708-29-8 2,5-Dihydrofuran NGS 87 <0.33	Furans in	Vapor	Samples by S	WI										
1708-29-8 2,5-Dihydrofuran NGS 87 <0.33 <0.33 n/a n/a n/a n/a 0.33 625-86-5 2,5-Dimethyfluran NGS 89 <0.75	S16T029807	L	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
625-86-5 2,5-Dimethylfuran NGS 89 <0.75 <ii><ii><ii> <ii><ii> <ii><ii><ii> <ii><ii><ii><ii><ii><ii><ii><ii><ii><i< td=""><td>S16T029807</td><td>H</td><td>1708-29-8</td><td>2,5-Dihydrofuran</td><td>NGS</td><td>87</td><td><0.33</td><td><0.33</td><td>n/a</td><td>n/a</td><td>n/a</td><td>n/a</td><td>0.33</td><td>n/a U</td></i<></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii></ii>	S16T029807	H	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
3777-71-7 2-Heptylfuran NGS 120 <0.86 <0.86 n/a n/a n/a n/a n/a n/a 0.86 534-22-5 2-Methylfuran NGS 110 <0.046	S16T029807	L	625-86-5	2,5-Dimethylfuran	NGS	88	<0.75	<0.75	n/a	n/a	n/a	n/a	0.75	n/a U
534-22-5 2-Methylfuran NGS 81 <0.46 <0.46 n/a n/a n/a n/a 6.46 3777-69-3 2-Pentyffuran NGS 110 <0.90	S16T029807	L	3777-71-7	2-Heptyffuran	NGS	120	<0.86	<0.86	n/a	n/a	n/a	n/a	0.86	n/a U
3777-69-3 2-Pentyfluran NGS 110 <0.90 <0.90 n/a n/a n/a n/a n/a 0.90 4229-91-8 2-Propyfluran NGS 94 <0.62	S16T029807	L	534-22-5	2-Methylfuran	NGS	81	<0.46	<0.46	n/a	n/a	n/a	n/a	0.46	n/a U
4229-91-8 2-Propylfuran NGS 94 <-0.62 <-0.62 n/a n/a n/a n/a n/a 0.62 110-00-9 Furan NGS 70 <-0.37	S16T029807		3777-69-3	2-Pentyffuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	0.90	n/a U
110-00-9 Furan NGS 70 <0.37 <0.37 n/a n/a n/a 0.37 0.37 10-09-99-9 Tetrahydrofuran NGS 92 <0.23 17 n/a n/a n/a 0.23 17 n/a n/a n/a 0.23 18 19 19 19 19 19 19 19	S16T029807	L	4229-91-8	2-Propyifuran	NGS	98	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a U
109-99-9 Tetrahydrofuran NGS 92 <-0.23 17 n/a n/a n/a 0.23 0.23	S16T029807	L	110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	n/a U
	S16T029807	L	109-99-9	Tetrahydrofuran	NGS	92	<0.23	17	n/a	n/a	n/a	n/a	0.23	n/a

Q - Qualitative

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

21 - Nov - 2016 15:26:34 DSRHardcopyWOLimits 3.0.13 DSR.Jar v. 3.0.12

Sample# R	R A# CAS#	Analyte	Unit	% QLS	Blank	Result	Duplicate	Average	RPD %	Average RPD % Spk Rec %	_	Det Limit Cnt Err % Qual Flags
Furans in Va	Furans in Vapor Samples by SI	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	88	<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 11
S16T029808	3777-69-3	2-Pentylfuran	NGS	110	<0.90	<0.90	n/a	n/a	n/a	n/a	06.0	D/a []
S16T029808	4229-91-8	2-Propylfuran	NGS	94	<0.62	<0.62	n/a	n/a	n/a	n/a	0.62	n/a [1]
S16T029808	110-00-9	Furan	NGS	70	<0.37	<0.37	n/a	n/a	n/a	n/a	0.37	D/a/U
S16T029808	109-99-9	Tetrahydrofuran	NGS	92	<0.23	0.56	n/a	n/a	n/a	n/a	0.23	1.8/0
												0

C.3.4 Amines



ANALYTICAL REPORT

Report Date: September 20, 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

20162741

Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029631				Collected: 09/10/2016
Lab ID: 1625968001		Sampling Location:	CARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliph			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ide]
Analyte	Result (ug/sample)) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N/	NA NA	0.10
Ethylamine	<0.10	N/	NA NA	0.10
Methylamine	<0.10	N/	NA NA	0.10

Sample ID: \$16T029632 Lab ID: 1625 968002		Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic V			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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	8	Sampling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliphati			C 226-96, XAD-7 Tu 100mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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IHREP-V12.3



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		Sampling Location:	CARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic		207,000	SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

Sample ID: \$16T029635 Lab ID: 1625968005	s	Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliph			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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		Sampling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Alipha			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T029637 Lab ID: 1625968007		Sampling Location: CA	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Alipha			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029638				Collected: 09/10/2016
Lab ID: 1625968008		Sampling Location:	CARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliphati		2073050	SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

Sample ID: \$16T029639 Lab ID: 1625968009	S	Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphat			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T02964 0 Lab ID: 1625968010		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Alip			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m		RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

Sample ID: \$16T029641 Lab ID: 1625 968011		Sampling Location: C	ARTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic			KC 226-96, XAD-7 Tul 0/100mg [(NBD) Chlor ir Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

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Sample ID: S16T029642				Collected: 09/10/2016
Lab ID: 1625968012		Sampling Location: CA	ARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Alipha			(C 226-96, XAD-7 Tul /100mg [(NBD) Chlor r Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T029643 Lab ID: 1625968013		Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic VAA-1			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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: \$16T029644 Lab ID: 1625968014		Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphat			226-96, XAD-7 Tul 00mg [(NBD) Chlor /olume Not Provid	ide]
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: \$16T029645 Lab ID: 1625968015		Sampling Location: CA	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliph			C 226-96, XAD-7 Tul 100mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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

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Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

, and y mode in the call to				
Sample ID: S16T029646				Collected: 09/10/2016
Lab ID: 1625968016		Sampling Location: Ca	ARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliphat			(C 226-96, XAD-7 Tul /100mg [(NBD) Chlor r Volume Not Provid	ide]
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: \$16T029647 Lab ID: 1625968017	5	Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphati			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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 Lab ID: 1625968018		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Alip			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	0.13	N	A NA	0.10

Sample ID: \$16T029649 Lab ID: 1625968019		Sampling Location: CA	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Alipha			226-96, XAD-7 Tul 100mg [(NBD) Chlor Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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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Workorder: 34-1625968

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029650				Collected: 09/10/2016
Lab ID: 1625968020		Sampling Location: C	ARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic VAA			KC 226-96, XAD-7 Tu 0/100mg [(NBD) Chlor ir Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m²)	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	
Ai VOA Ali-b-di- VAA d	/S/ Christopher Winter	/S/ Thomas Bosch	
mines-VOA Aliphatic VAA-1	09/20/2016 10:33	09/20/2016 11:19	

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



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	1A# 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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:	PROPERTY OF ENGINEER WAS ASSOCIATED AS	AMAGENTATION CO.	MAY STATE
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.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.</p>
 () This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Envrionmental 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

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Quality Control Sample Batch Report

Analysis Information

Workorder: 1625968

 Limits: Historical/Performance
 Preparation: NA
 Analysis: IH Aliphatic Amines

 Basis: ALS Laboratory Group
 Batch: NA
 Batch: ILC/12667 (HBN: 176885)

 Prepared By: NA
 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 LCSD: 518833 Analyzed: 09/19/2016 00:00 Analyzed: 09/19/2016 00:00

Dilution: 1 Dilution: 1

Units: ug/sample 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	/S/ Thomas Bosch	
09/20/2016 10:33	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

									014 000	
Assembler N/A					ਚ	AIN OF	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST		201627	41 of 2
Collector					Contact/Requestor	estor		Telephone No ₃₇₃ -68.61 N	MSIN FAX 372-1878	-1878
SAF No.	4				Sample Origin	ALUATION		Purchase Order/Charge Code 202062/CB20		
Project Title	LIBETION				Logbook Work Package No.	k Package N	°c	ice Chest No. Lust C.C.	Temp.	30E
Shipped To (Lab)	ab) · · (qe				Method of Shipment	oment		Bill of Lading/Air Bill No.	2772	BELL OLLE
Protocol N/A					Data Tumaround	pu		Parts and Return No. 41310		
Sample No.	Lab ID		Date	Time	No./Type Container	ee.	Samp	Sample Analysis		Preservative
	S16T029631	V.	9/10/16		XAD-7-NBD	AMINES	16-08068-4-BASE-EFF/		z	N/A
	S16T029632	\$	9/10/16		XAD-7-NBD	AMINES	16-08068-4-BASE-IN /		z	N/A
	S16T029633	N/	9/10/16		XAD-7-NBD	AMINES	16-08068-4-BLANK-EFF /		Z	N/A
	\$167029634	×	9/10/16		XAD-7-NBD	AMINES	16-08068-4-BLANK-INP		Z	N/A
	\$167029635	VA	9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-A /			N/A
	S16T029636	VA	9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-BJ		×	N/A
	\$167029637	V.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-C,		z	N/A
	\$167029638	A.V	9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-D;		z	N/A
	\$167029639	8	9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-E/		x	N/A
	\$167029640	8,	9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-F;		z,	N/A
OSSIBLES	AMPLE HAZARDS/F	REMA	RKS (List all k	nown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes	Yes O No	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl W Howald@il.gov and Greg_S_Moore@rl.gov see SOW for email CONTRACT 55502 RELEASE 9		Hold Time	
Relinquished By	By Print (olfur) Lu	7	Sign Llid 9-1.	31-11-6		Received By	Received By Gradisher Sign WRPS Of Illi Cradustin		= Soil DL =	= Drum Liquids = Tissue
Relinquished Bradisher WRPS	Bradisher 11/1/	0	rachoh	16	8	Received by	FEDEX	ខ្លួន	۳٤	= Wipe = Liquid
Relinquished	PA CALLY	D	-			Received By	Murada Flumby Man Slum	Alg lokal	= Water	= Vegetation = Vapor = Other
Relinquished By	By	1			Date/Time	Received By		8	m Solids	
FINAL SAMPLE DISPOSITION	Disposal	(e.g.,	Return to cust	tomer, per	Method (e.g., Return to customer, per lab procedure, Sed	sed in processy	Olsposed By	21/11/6	/4 15;00	
All camples or	votatining hazardous	mater	rials shall be p	icked up b	v requestor and retu	irried to pare	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A-600;	A-6003-962 (03/05)

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Assembler N/A					CHA	IN OF	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	IALYSIS REQUEST	C.O.C. No. 20162741 Page 2 of	2741 of 2
Collector					Contact/Requestor	50		Telephone No ₃₇₃ -6861	MSIN	72-1878
SAF No.					Sample Origin	MATTON		Purchase Order/Charge Code		
Project Title	LUATION				Logbook Work Package No.	ackage No	.0	Very STNO. 033	Temp.	ON ICE
Shipped To (Lab)	ab)				Method of Shipment	ent		Bill of Lading/Air Bill No.	BUTH OTTE ITTT.	SCTY 6
Protocol N/A					Data Turnaround			Parts and Return No.	41310	
Sample No.	Lab ID		Date	Time	No /Type Container		SS	Sample Analysis		Preservative
	\$16T029641	N.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-EFF-G,			N/A
	S16T029642	N.	VA 9/10/16		XAD-7-NBD	AMINES	AMINES 16-08068-4-EFF-H			N/A
	S16T029643	N.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-A ;			N/A
	\$167029644	Z,	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-B /			N/A
	\$167029645	V.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-C'			N/A
	\$16T029646	V.	9/10/16 AV		XAD-7-NBD	AMINES	16-08068-4-IN-D /			N/A
	\$16T029647	V.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-EF			N/A
7	S16T029648	Y.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-F,			N/A
	S16T029649	VA	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-G,			N/A
	S16T029650	V.A.	VA 9/10/16		XAD-7-NBD	AMINES	16-08068-4-IN-H ;			N/A
POSSIBLE S/	AMPLE HAZARDS/F	REMAI	RKS (List all I	known was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	o ⊙		SPECIAL INSTRUCTIONS CAR Results to Carl Howald IV & Greg Moore Carl M Howalder, gov and Greg_S_Moore@rl.gov ace SOW for email CONTRACT \$5502 RRIENSE 9	Hold Time	
Relinquished By	eller M	3	Sign Sign	11.41-6	Date/Time Re	Seived By	Received By Gradistiel Sign WRPS () J. J. Coeled	9/14/16	σ b	
Relinquished	1	10	11 Gardon	1967	-0	Received By	√ FEDEX	Date/Time	SC = Sediment - SO = Solid WI	= IISSUE = Wipe = Liquid
Relinquished By (4)	P	1				Received By Received By	edrums david saws	Date/Time 	W = Water V O = Oil VA A = Air X DS = Drum Solids	= Vegetation = Vapor = Other
FINAL SAMPLE DISPOSITION		(e.g.,	Return to cus	tomer, per	Disposal Method (e.g., Return to customer, per lab procedure, used in process	process)	Disposed By Carsured	Spo	Date/Time	• ^
All samples co	entaining hazardous	mater	ials shall be p	cicked up by	y requestor and return	ed to paren	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A-6	A-6003-962 (03/05)

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Report Date: September 21, 2016

Phone: (509) 373-1262

Robert (Buddy) Sosa Washington River Protection So PO Box 850, MSIN T6-02 E-mail: robert_w_sosa@rl.gov Richland, WA 99352

Workorder: 34-1625969

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

ranagarour moounto				
Sample ID: S16T029611				Collected: 09/10/2016
Lab ID: 1625969001		Sampling Location: CA	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Alipha			C 226-96, XAD-7 Tul 100mg [(NBD) Chlor Volume Not Provid	ide]
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: \$16T029612 Lab ID: 1625969002		ampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliph			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m ³) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N/	A NA	0.10
Ethylamine	<0.10	N	NA NA	0.10
Methylamine	<0.10	N/	A NA	0.10

Sample ID: \$16T029613 Lab ID: 1625969003	\$	Sampling Location:	CARTRIDGE EVA	ALUATION	Collected: 09/10/2016 Received: 09/15/2016
Method: Amines-VOA Aliphatic \		1107-70070	SKC 226-96, XAD- 50/100mg [(NBD) C Air Volume Not Pr	hloride]	Analyzed: 09/20/2016
Analyte	Result (ug/sample)	Result (mg/m) Result (ppi	m) RL (ug	g/sample)
Dimethylamine	<0.10	N.	Α Λ	NA .	0.10
Ethylamine	<0.10	N	Α Λ	IA.	0.10
Methylamine	<0.10	N.	Α Ν	NA.	0.10

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

Environmental 3

www.alsglobal.com

RIGHT SOLUTIONS HIGHT PARTNER

1625969 - Page 1 of 10 Wed, 09/21/16 12:55 PM Page 1 of 7



Workorder: 34-1625969
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Allarytical Results				
Sample ID: S16T029614				Collected: 09/10/2016
Lab ID: 1625969004		Sampling Location:	CARTRIDGE EVALU	ATION Received: 09/15/2016
Method: Amines-VOA Alipha			SKC 226-96, XAD-7 Tul 50/100mg [(NBD) Chlor Air Volume Not Provid	ide]
Analyte	Result (ug/sample)	Result (mg/m ³) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N/	A NA	0.10
Ethylamine	<0.10	N/	A NA	0.10
Methylamine	<0.10	N/	A NA	0.10

Sample ID: S16T029615 Lab ID: 1625969005	Sa	ampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphat			226-96, XAD-7 Tul 00mg [(NBD) Chlor Volume Not Provid	ide]
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: \$16T029616 Lab ID: 1625969006		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 IATION Received: 09/15/2016
Method: Amines-VOA Aliphatic VAA			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N.	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N.	A NA	0.10

Sample ID: S16T029617 Lab ID: 1625 969007		Sampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphatic			226-96, XAD-7 Tu 100mg [(NBD) Chlor Volume Not Provid	ide]
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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Workorder: 34-1625969
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029618				Collected: 09/10/2016
Lab ID: 1625969008		Sampling Location: C.	ARTRIDGE EVALUA	ATION Received: 09/15/2016
Method: Amines-VOA Aliph			KC 226-96, XAD-7 Tul 0/100mg [(NBD) Chlor ir Volume Not Provid	ide]
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 Lab ID: 1625969009	Sa	ampling Location: CA	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphati			226-96, XAD-7 Tu 100mg [(NBD) Chlor Volume Not Provid	ide]
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: \$16T029620 Lab ID: 1625 969010		Sampling Location:	CARTRIDGE EVAL	Collected: 09/10/2016 UATION Received: 09/15/2016
Method: Amines-VOA Aliphatic			SKC 226-96, XAD-7 T 50/100mg [(NBD) Chi- Air Volume Not Prov	oride]
Analyte	Result (ug/sample)	Result (mg/m	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	< 0.10	N	A NA	0.10

Sample ID: S16T029621 Lab ID: 1625969011		Sampling Location: CA	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliph			C 226-96, XAD-7 Tu 100mg [(NBD) Chlor Volume Not Provid	ide]
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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Workorder: 34-1625969
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

A larytroa Rosalts				
Sample ID: S16T029622				Collected: 09/10/2016
Lab ID: 1625969012		Sampling Location:	CARTRIDGE EVALU	JATION Received: 09/15/2016
Method: Amines-VOA Aliphat			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provid	ride]
Analyte	Result (ug/sample)) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

Sample ID: S16T029623 Lab ID: 1625969013	S	ampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphati			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
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: \$16T029624 Lab ID: 1625969014		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 UATION Received: 09/15/2016
Method: Amines-VOA Aliphatic VA			SKC 226-96, XAD-7 T 50/100mg [(NBD) Chlo Air Volume Not Provi	oride]
Analyte	Result (ug/sample)	Result (mg/m	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	< 0.10	N	A NA	0.10

Sample ID: \$16T02962 Lab ID: 1625969015		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 JATION Received: 09/15/2016
Method: Amines-VOA Alij			SKC 226-96, XAD-7 To 50/100mg [(NBD) Chlo Air Volume Not Provi	oride]
Analyte	Result (ug/sample)		3) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

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Workorder: 34-1625969
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

ration yerous recounts				
Sample ID: S16T029626				Collected: 09/10/201
Lab ID: 1625969016		Sampling Location:	CARTRIDGE EVALU	ATION Received: 09/15/201
Method: Amines-VOA Alipha			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlor Air Volume Not Provid	ide]
Analyte	Result (ug/sample)) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N/	A NA	0.10
Ethylamine	<0.10	N/	A NA	0.10
Methylamine	<0.10	N/	A NA	0.10

Sample ID: \$16T029627 Lab ID: 1625969017	S	ampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: Amines-VOA Aliphatio			226-96, XAD-7 Tu 00mg [(NBD) Chlor Volume Not Provid	ide]
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 Lab ID: 1625969018	5	Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 JATION Received: 09/15/2016
Method: Amines-VOA Aliphatic			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provi	ride]
Analyte	Result (ug/sample)	Result (mg/m ³) Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N/	A NA	0.10
Ethylamine	<0.10	N/	NA NA	0.10
Methylamine	<0.10	N/	NA NA	0.10

Sample ID: \$16T02962 9 Lab ID: 1625969019		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 JATION Received: 09/15/2016
Method: Amines-VOA Alip			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provid	ride]
Analyte	Result (ug/sample)	Result (mg/m	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N	A NA	0.10
Ethylamine	<0.10	N	A NA	0.10
Methylamine	<0.10	N	A NA	0.10

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Workorder: 34-1625969

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029630 Lab ID: 1625969020		Sampling Location:	CARTRIDGE EVALU	Collected: 09/10/2016 JATION Received: 09/15/2016
Method: Amines-VOA Aliph			SKC 226-96, XAD-7 Tu 50/100mg [(NBD) Chlo Air Volume Not Provid	ride]
Analyte	Result (ug/sample)		Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	N.	A NA	0.10
Ethylamine	<0.10	N.	A NA	0.10
Methylamine	<0.10	N.	A NA	0.10

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	
Andrew Man Allehade Man 4	/S/ Christopher Winter	/S/ Thomas Bosch	
Amines-VOA Aliphatic VAA-1	09/21/2016 11:59	09/21/2016 12:53	

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



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/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	lowa	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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.com

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.

< This testing result is less than the numerical value.

ALS Envrionmental 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

Page 7 of 7 IHREP-V12.3

^{**} No result could be reported, see sample comments for details.

⁽⁾ This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625969

 Limits: Historical/Performance
 Preparation: NA
 Analysis: IH Aliphatic Amines

 Basis: ALS Laboratory Group
 Batch: NA
 Batch: ILC/12671 (HBN: 176915)

 Prepared By: NA
 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 LCSD: 518905
Analyzed: 09/20/2016 00:00 Analyzed: 09/20/2016 00:00
Dilution: 1 Dilution: 1

 (lution: 1
 Dilution: 1

 Units: ug/sample
 Units: ug/sample

%Rec QC Limits Result % Rec RPD QC Limits Analyte Result Target Dimethylamine 4.05 4.00 101 60.4 134.6 4.01 100 0.992 0.0 20.0 4.57 Ethylamine 4.63 4.00 116 40.0 160.0 114 1,28 0.0 20.0 20.0 Methylamine 4.29 4.00 107 40.0 160.0 4.20 105 1.98 0.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review	
/S/ Christopher Winter	/S/ Thomas Bosch	
09/21/2016 11:59	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

Telephone No.313-6861 MSIN G-05 FAX 31 Telephone No.313-6861 MSIN G-05 FAX 31 Purchase Quder/Charge Code Coc. Coc. No.	3										
Page 1 Page 1 Page 1 Page 2 Page 3 Page 4 Page 4 Page 4 Page 5 P	Assembler 1/A					3	A NI A	CHSTODY/SAMPI F ANAI	YSIS REDITEST	C.O.C. No. 2016274	0
Contactive Exercises						5				Page 1 o	2
Sample Vind Facings No. Control Charge Code	Collector					Contact/Reque	stor v			SIN FAX 372-	878
Cog Chest No. Logocol Work Package No. Each Chest No. Logocol Work Package No. Logocol Work	SAF No.	,				Sample Origin CARTRIDGE EVE	LUATION		Purchase Order/Charge Code		
Date Time No. Type Container Sample Analysis Sample Analysi	Project Title	LUATION				Logbook Work	Package N	0.	Ice Chest No. W. + 5-033	30	30
Date Time No.Type Cortainer Sample Analysis Sample Analysis Sample Analysis Sample Analysis Sample Analysis	Shipped To (La	(qe				Method of Ship	ment		Bill of Lading/Air Bill No. 77	10TTE GT	1738
1	Protocol /A					Data Turnarou	pu		7	0	
1	Sample No.	Lab ID	٠	Date	Time	No./Type Contain	74.	Sample	a Analysis	4	Preservative
VA 9/10/16 XXD-7-NBD AMINES 16-07837-4-BASK-18 		S16T029611	5				-			Z	A
VA 5/10/16 XAD-7-NBD ANTHES 16-07837-4-BTEPA ; VA 5/10/16 XAD-7-NBD ANTHES 16-07837-4-BTEPA ; VA 5/10/16 XAD-7-NBD ANTHES 16-07837-4-BTEPE ; Send and send send send send send send send se		S16T029612	Z,	9/10/16		XAD-7-NBD	AMINES			/N	æ
VA 9/10/16 XXD-7-NBD		S16T029613	Z,	9/10/16		XAD-7-NBD	AMINES	16-07837-4-BLANK1 (.		/N	A
VA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-C .		S16T029614	8	9/10/16		XAD-7-NBD	AMINES	16-07837-4-BLANK2 / ·		N	4
VA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-C; WA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-C; WA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-D; WA 9/10/16 WA 10/16		S16T029615	A.V	9/10/16		XAD-7-NBD	AMINES			/N	W.
VA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-D; VA 9/10/16 AMINES 16-07837-4-EFF			VA.	91/01/6		XAD-7-NBD	AMINES	16-07837-4-EFF-B, .		/N	
VA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-D;		S16T029617	V.	9/10/16		XAD-7-NBD	AMINES			/N	4
VA 9/10/16 XAD-7-NBD AMINES 16-07837-4-EFF-F;		S16T029618	N	9/10/16		XAD-7-NBD	AMINES			/N	4
VA 9/10/16 XAD-7-NBD ANINES 16-07837-4-EFF-F; Hold Time		S16T029619	5	9/10/16		XAD-7-NBD	AMINES			N	W.
Sign Date/Time Received By Gradish Mark Sign Date/Time No Solid Wark Date/Time Received By Gradish Mark Sign Date/Time No Solid Wark Date/Time Received By Gradish Mark Sign Date/Time No Solid Wark D		S16T029620	2 A	9/10/16		XAD-7-NBD	AMINES			/N	*
Sign Date/Time Received By Gradishan Sign Date/Time Received By FEDEX OLIVE, 9/14/14, 0900 S = Soil DL Date/Time Received By FEDEX Date/Time SE = Sediment T SE = Sediment T Date/Time SE = Sediment T S	OSSIBLES	NMPLE HAZARDS/F	EMA	KKS (List all I	mown was	tes) MSDS ()	© ⊗			iold Time	
(A)C DateTime Received By DateTime Received By DateTime Received By Disposed By Od (e.g., Return to customer, per lab procedure, usefun procedure, usef	Selinquished I	By Print Mulder Madisher	本で	Sign - F	2 - 12 - 12	Time	Received By	ului.	Date/Time SE Date/Time SE SE	Matrix*	= Drum Liquids = Tissue = Wipe = Liquid
Disposal Method (e.g., Return to customer, per lab procedure, usefunctions) Disposed By G II	Relinquished	The Contract of the Contract o	لح [Mynkk A	edunds appeal sand	30∢	> \$ ×	= Vegetation = Vapor = Other
Disposal Method (e.g., Keturn to customer, per rap procedure, usefun process) 16/16	reiinquisned	by.				-4	for named		Sa	Drum Solids	
	DISPOSITION		(e.g.,	deturn to cus	omer, per	lab procedure, used	No constitution of the con	Contract by	11/11/16		

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N/A					CH	AIN OF CUST	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	ALYSIS REQUEST	20162740 Page 2 of	162740 2 of 2
Collector					Contact/Requestor	stor		Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
SAF No.					Sample Origin	UNTION		Purchase Order/Charge Code 202062/CB20		
Project Title	TUALLON				Logbook/ Work Package No.	Package No.		Ice Chest No. W+5-023	123 Temp. On ICE	しまれた
Shipped To (Lab)	(qı				Method of Shipment	ment		Bill of Lading/Air Bill No.	3114/11.	777227704P
Protocol N/A					Data Turnaround	ום		Parts and Return No. V. Co.	1013 41310	010
Sample No.	Cab ID	•	Date	Time	No./Type Container		San	Sample Analysis		Preservative
	\$167029621	8	9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-EFF-G . ,			N/A
	\$167029622	\$	91/01/6		XAD-7-NBD	AMINES 16-078	16-07837-4-EFF-H # .			N/A
	S16T029623	N.	9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-A)			N/A
	S16T029624	V.	VA 9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-B ; .			N/A
	S16T029625	\$	VA 9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-C .			N/R
5-519	S16T029626	4×	9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-D 4 ·			N/A
	S16T029627	V.A.	9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-E f			K/N
	S16T029628	Y.	VA 9/10/16		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-F + ·			N/A
	8161029629	V.A.	VA 9/10/16	. 14	XAD-7-NBD	AMINES 16-078	16-07837-4-IN-G % ·			N/A
	S16T029630	V.A.	91/01/6		XAD-7-NBD	AMINES 16-078	16-07837-4-IN-H , .			N/A
OSSIBLE SA	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	EMA	RKS (List all k	cnown wast	O sasw	⁹ ⁄	SPECIAL INSTRUCTIONS CARL Results to Carl M CARL W Howald@rl, gov at see SOW for email CONTRACT 55502 RELEASE 9	SPECIAL INSTRUCTIONS Sand Results to Carl Howald IV & Greg Moore Carl M Revald&rl.gov and Greg_S_Moore@rl.gov see SOW for email CONTRACT 55502 RELEASE 9	Ною Тіте	
Relinquished By	M. No. 1h	14	Sign Sign	60 91	Date/Time	Received By Gradisher	sign Sign	9/14/16 Date/Time	= Soil	- PSS
A Selinduished	Relinquished By Gradisher	0	(Carlow)	10/	Date/Time Re	Received By	FEDEX	Date/Time S	= Sediment = Solid = Studge	T = Tissue WI = Wipe L = Liquid
Relinquished By	and and	1				Received By Mundall, EdunAS Received By	Mend Hust	Date/Time	W = Water V = Oil V = Air X	~ ₹ ₺
NAL SAMPLE		.g.	Return to cust	omer, per l	nsec	r-process)	Sig		Date/Time	îme
DISPOSITION					,	101	Correct		Sr:41 11/4/6	45

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C.3.5 **Acetonitrile**



ANALYTICAL REPORT

Report Date: September 22, 2016

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 q cook 9/26/16

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

Richland, WA 99352

Collected: 09/10/2016 Sample ID: \$16T02 \$671 Received: 09/15/2016 Lab ID: 1625962001 Sampling Location: CARTRIDGE EVALUATION Analyzed: 09/15/2016 Method: NIOSH 1606 Media: SKC 226-09, Charcoal Tube 400/200mg Sampling Parameter: Air Volume Not Provided Result Result (ppm) (mg/sample) Result (mg/m³) Analyte Acetonitrile 0.010 < 0.010

9 and 9/26/16 Sample ID: \$16T02x672 Collected: 09/10/2016 Sampling Location: CARTRIDGE EVALUATION Received: 09/15/2016 Lab ID: 1625962002 Media: SKC 226-09, Charcoal Tube Analyzed: 09/15/2016 Method: NIOSH 1606 400/200mg Sampling Parameter: Air Volume Not Provided Result Result (ppm) RL (mg/sample) (mg/sample) Result (mg/m³) Analyte <0.010 NA NA 0.010 Acetonitrile

9 and 9/26/16 Collected: 09/10/2016 Sample ID: \$16T02\(673 Sampling Location: CARTRIDGE EVALUATION Received: 09/15/2016 Lab ID: 1625962003 Media: SKC 226-09, Charcoal Tube Analyzed: 09/15/2016 Method: NIOSH 1606 400/200mg Sampling Parameter: Air Volume Not Provided Result Result (ppm) RL (mg/sample) Analyte (mg/sample) Result (mg/m³) NA NA < 0.010 Acetonitrile

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992

ALS GROUP USA, CORP. An ALS Limited Company Environmental 3

www.alsglobal.com

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Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results و Analytical Results	9/26/16		Project Manager:		
Sample ID: S16T02X674 Lab ID: 1625962004		impling Location: CAF	RTRIDGE EVALUA	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg Jolume Not Provid		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 work	9/26/16				
Sample ID: S16T02 675 Lab ID: 1625962005	<u></u>	impling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 0274	alzoku				
Sample ID: S16T021676 Lab ID: 1625962006		ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	San		226-09, Charcoal 200mg		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (opm)	RL (mg/	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 000	(9/20/14				
Sample ID: S16T02X677 Lab ID: 1625962007		ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal 200mg		Analyzed: 09/15/2016
MATERIAL SOLDER	Result	npling Parameter: Air	volume Not Provid	ea	
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/	sample)
Acetonitrile	<0.010	NA -	NA	_	0.010
9 0.47	1 9/20/14				THE STATE OF THE S
Sample ID: S16T027678 Lab ID: 1625962008	Sa	ampling Location: CA	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	San		226-09, Charcoal /200mg Volume Not Provid		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	D-V - V	/sample)
Acetonitrile	<0.010	NA	NA		0.010

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Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9

Project Manager: Rand Potter

5 8168 059 9 2 12			Project Manager:	Rand Po	tter
Analytical Results 9 aug Sample ID: S16T021679 Lab ID: 1625962009		ampling Location: CA	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		Media: SKO	226-09, Charcoal /200mg	Tube	Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (rng/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA.		0.010
9 007/	9/zulic				
Sample ID: S16T02V680 Lab ID: 1625962010		ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		Media: SKO	226-09, Charcoal /200mg	Tube	Analyzed: 09/15/2016
	Result	inputing Farameter: AIF	volume Not Provid	ieu	TABLE TO SERVE
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	0.013	NA	NA		0.010
9 cust	9/26/4				
Sample ID: \$16T02\(^{681}\) Lab ID: 1625962011	5	ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	San		226-09, Charcoal /200mg		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 cutos	9/20/16				
Sample ID: S16T02X682 Lab ID: 1625962012		ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		Media: SKC 400	226-09, Charcoal 200mg	Tube	Analyzed: 09/15/2016
Service Commission	Result	npling Parameter: Air	Volume Not Provid	led	
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 own	9/26/16				
Sample ID: \$16T021683 Lab ID: 1625962013		ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		Media: SKC 400	226-09, Charcoal 200mg	Tube	Analyzed: 09/15/2016
And the second second	San Result	npling Parameter: Air	Volume Not Provid	ed	A CONTRACTOR OF THE PARTY OF TH
	Pacifil				
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)

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ANALYTICAL REPORT

IHREP-V12.3

Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rei9
Project Manager: Rand Potter

			Project Manager:	Rand Pot	tter
Analytical Results 9 cw7/ Sample ID: S16T02\684 Lab ID: 1625962014	COL	sampling Location: CAF	RTRIDGE EVALUA	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	Sa		226-09, Charcoal 7 200mg Volume Not Provide		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 000%	9/26/14				
Sample ID: \$16T02\$685 Lab ID: 1625962015	A	sampling Location: CAI	RTRIDGE EVALUA	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	0.	400	226-09, Charcoal 7 200mg		Analyzed: 09/15/2016
THE REPORT OF THE PARTY OF THE	Result	mpling Parameter: Air	volume Not Provid	eq	S EIGHT WASH
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 aux	9/26/16				
Sample ID: S16T027686 Lab ID: 1625962016	s	sampling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	Sa		226-09, Charcoal 7/200mg		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010
9 cross	9/26/14				
Sample ID: S16T02X687 Lab ID: 1625962017		Sampling Location: CAF	RTRIDGE EVALUA	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606	Sa		226-09, Charcoal 1 200mg		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	eample)
Acetonitrile	<0.010	NA NA	NA NA	tom friends	0.010
	9/26/16				- 47171176
Sample ID: S16T02 1688	4/20/10			_	Collected: 09/10/2016
Lab ID: 1625962018	S	sampling Location: CAF	RTRIDGE EVALUA	ATION	Received: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal 7 200mg		Analyzed: 09/15/2016
THE PERSON	Result	mpling Parameter: Air	Volume Not Provid	eu	THE GOVERNMENT SOUTH
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010

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Workorder: 34-1625962

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results 9 cord 9/26/16

Lab ID: 1625962019	Sa	impling Location: CAF	RTRIDGE EVALU	ATION	Received: 09/15/2016
					110001100. 03/13/2010
Method: NIOSH 1606	Sam		226-09, Charcoal 200mg Volume Not Provid		Analyzed: 09/15/2016
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RI. (mg/s	sample)
Acetonitrile	<0.010	NA	NA		0.010

9 cups 9/26/14

Acetonitrile	<0.010	NA	NA		0.010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sa	mple)
Method: NIOSH 1606	San		226-09, Charcoal 200mg /olume Not Provid		Analyzed: 09/15/2016
Sample ID: \$16T02\$690 Lab ID: 1625962020	Sa	impling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Mathod	Analyst	Peer Review
NICON 1000	/S/ Young Hee Yoon	/S/ Steven J. Sagers
NIOSH 1606	09/22/2016 11:23	09/22/2016 12:03

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

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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/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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			7 - 10
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.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 Envrionmental 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: Hstorical/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

MDL RL Analyte Result Acetonitrile ND NA 0.0100

MB: 518332

Analyzed: 09/15/2016 00:00

Units: mg/sample

Analyte Result 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	v .					LCSD: 51 Analyzed: 09 Dilution: 1 Units: m	0/15/2016 0	0:00		
Analyte	Resuit	Targat	% Rec	QC Li	mite	Result	% Rec	RPD	QC Li	mits
Acetonitrile	0.307	0.312	98.4	86.6	115.3	0.313	100	1.94	0.0	20.

LCS: 518333

Analyzed: 09/15/2016 00:00

Dilution: 1

Units: mg/sample % Rec QC Limits Analyte Result Target Acetonitrile 0.259 0.250 104 86.6 115.3

LCSD: 518334

Analyzed: 09/15/2016 00:00

Dilution: 1

0.244

Units: mg/sample Result % Rec RPD QC Limits

5.96

97.8

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	/S/ Steven J. Sagers
09/22/2016 11:23	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

Page 1 of 1

Thursday, September 22, 2016 1625962 - Page 7 of 9

QCS V4.1

Date Time N S/10/16 CH VA S/10/16 CH CH VA S/10/16 CH VA S/10/16 CH CH VA S/10/16 CH CH CH VA S/10/16 CH CH CH CH CH CH CH C	CHAIN OF C Contact/Requestor Contact/Requestor Contact/Requestor Contact/Requestor Contact/Requestor Contact/Requestor Contact/Requestor Contact/Requestor Contact/Reduestor C	Sample Sample File 16-08068-5-BASE-EFF 1 File 16-08068-5-BASE-IN File 16-08068-5-BASE-IN File 16-08068-5-BASE-IN File 16-08068-5-BASE-IN File 16-08068-5-BASE-IN File 16-08068-5-EFF-G File 16-08068-5-EFF-G	. 140 10 11 1 1	201627443 Page 1 of 2 MSIN ₂₆₋₀₂ FAX 372-1878 ode Temp. T.C.C. 772, 2770 4728 H1310 Preservative N/A N/A
Lab ID Date Time No Sign CER Sign Sign Sign Sign Sign Sign Sign Sign	A Part A	Sample 16-08068-5-BASE-EFF 1 Lile 16-08068-5-BASE-IN Lile 16-08068-5-BASE-IN Lile 16-08068-5-BLANK-EFF 1 Lile 16-08068-5-EFF-3 1 Lile 16-08068-5-EFF-3 1	ie No 313 – es 6.1 Cordent Charge C Second Cordent Carlo Second Carlo Ingelate Bill No.	2770 4
Lab D	bus and warm	Sample Lile 16-08068-5-BASE-EFF : Lile 16-08068-5-BLANK-EFF : Lile 16-08068-5-BLANK-EFF : Lile 16-08068-5-EFF-B : Lile 16-08068-5-EFF-B : Lile 16-08068-5-EFF-C :	Second Charge Control Charge Cha	1 2 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7
Lab D	with the part of t	Sample 16-08068-5-BASE-EFF 1 Tile 16-08068-5-BASE-IN Tile 16-08068-5-BLANK-EFF 7 Tile 16-08068-5-BLANK-EFF 7 Tile 16-08068-5-EFF-5 7 Tile 16-08068-5-EFF-5 7	FRO STATE OF THE S	27 JO 4
Lab D	a le	Sample Lile 16-08068-5-3ASE-BFE 1 Lile 16-08068-5-BASE-IN Lile 16-08068-5-BANK-BFE 1 Lile 16-08068-5-BIANK-IN 1 Lile 16-08068-5-BFF-A 1 Lile 16-08068-5-EFF-A 1 Lile 16-08068-5-EFF-A 1	anglar Bill No.	7 0776
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OSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) Relinquished By Print Sign D	Г	Acetonitzile 16-08068-5-EFF-F	7	N/R
Sign Sign	MSDS O Yes © No	SPECIAL INSTRUCTIONS Sand Results to Carl Rowald IV & Greg Moore Carl M Browllderl.gov and Gregory_S_Moorefirl. GOV FOF meatl RELEASE 9 Reference Contract # 55502		Hold Time
Relinquished Paredisher		stadisher Min Sign of	4/16 0400 S = 1	Matrix* = Soil DL = Drum Liquids = Sediment T = Tissue = Soid Wile Wine
is (Feedloon 944)	23	Received By MUTM-KI, Edunal Mond Musy Received By		= Sludge L = Liquid = Water V = Vegetation = Oil VA = Vapor = Air X = Other
FINAL SAMPLE Disposal Method (e.g., Return to customer, por lab procedure, (seed in process).	procedure, used in process,		Sept. 16, 2016 4230Pm	Date/Time

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ContactRequestor ContactRequestor ContactRequestor Sample ContactRequestor ContactReguestor Cont	Assembler N/A							CH	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	ANALYSIS REQUEST	2016277 2016277	627743
Sample Time Contained	Collector			1			Contact	WReques	stor	Telephone No ₃₇₃ -6861	X	372-1878
	SAF No.						Sample	Origin	LUATION	Purchase Order/Charge Code		
	Project Title	ALUATION					Logbool N/A	k/ Work	Package No.	loe Chest No.	Temp.	7 00
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				-	116		CHARCOAL	TOBE	Acetonitrile 16-08068-5-EFF-G	, ,		N/A
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CHARCOAL TUBE Acetonitrile 16-08068-5-TN-D ' CHARCOAL TUBE Acetonitrile 16-08068-5-TN-D ' CHARCOAL TUBE Acetonitrile 16-08068-5-TN-D ' CHARCOAL TUBE Acetonitrile 16-08068-5-TN-G ' Acet		\$ \$16702\684			91,		CHARCOAL	TOBE	Acetonitrile 16-08068-5-IN-B	•		N/A
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CERARCOAL TUBE Acetonitrile 16-08068-5-IN-E CERARCOAL TUBE Acetonitrile 16-08068-5-IN-E CERARCOAL TUBE Acetonitrile 16-08068-5-IN-G		S16T02 686			16		CHARCOAL	TOBE	Acetonitrile 16-08068-5-IN-D			N/A
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CELARCORL TUBE Acetonitrile 16-08068-5-TN-B		S16T021689			1.6		CHARCOAL	TOBE	Acetonitrile 16-08068-5-IN-G .			N/A
own wastes) MSDS O Yes No SPECIAL INSTRUCTIONS Send Results to Carl Bokeld IV & Greg Moore Carl W Revealds to Carl W Sovensell Gard W Results S Plint Soph A		S16T02\690		1 9/10/	91,		CHARCOAL	TOBE	Acetonitrile 16-08068-5-IN-H .			N/A
Date/Time of Received By Gradisher Sign Of Affle Of CO Date/Time of Control o	POSSIBLES	AMPLE HAZARD	SIREM	ARKS (L)	st all know	m wast	SOSM (se	Š O	% ⊙	NS rl Bowald IV & Greg Moore ov and Gregory_S_Moore@rl. # 55502	Hold Time	
2 9 14 16 Hooked By Date/Time Received By Date/Time	Relinquished Relinquished	By Print	- 44	Sign	3	2	Date/Time	S Re	WRPS ULL Clad	14/16 0900 Date/Time	Ma = Sediment	
Mindelle Elevale alleged 3 parts	WR Relinquished	By (M.	3 %	Dor	, da	6	Date/Tim	8		SC SALEYTIME W	= Solid = Studge = Water = Oil	
Date Time	Refinquished	By				,	Date/Time				s = Air X S = Drum Solids	= Other
FINAL SAMPLE Disposal Method (e.g., Return to customer, per lab procedure, (sed in process) Disposed By Ann Sept. 16, acr 6 42-Bop my Ossposmon	FINAL SAMPLE DISPOSITION		od (e.g.,	Return to	o custome	r, per	ab procedure,	used in	ug ibr	2000	Date/Time	g e

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Robert (Buddy) Sosa

ANALYTICAL REPORT

Report Date: September 22, 2016

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

Washington River Protection So PO Box 850, MSIN T6-02 Richland, WA 99352

Workorder: 34-1625967

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results 9 Curt 9 (20 (14 Sample ID: \$16T027651 Collected: 09/10/2016 Lab ID: 1625967001 Received: 09/15/2016 Analyzed: 09/15/2016 Media: SKC 226-09, Charcoal Tube Method: NIOSH 1606 400/200mg Sampling Parameter: Air Volume Not Provided Result Analyte (mg/sample) Result (mg/m²) Result (ppm) RL (mg/sample) Acetonitrile < 0.010 NA NA 0.010 and 9/20/1 Sample ID: \$16T02\652 Collected: 09/10/2016 Lab ID: 1625967002 Received: 09/15/2016 Method: NIOSH 1606 Media: SKC 226-09, Charcoal Tube Analyzed: 09/15/2016 400/200mg Sampling Parameter: Air Volume Not Provided

9 aux Sample ID: \$16T02 653 Collected: 09/10/2016 Received: 09/15/2016 Lab ID: 1625967003 Media: SKC 226-09, Charcoal Tube Analyzed: 09/15/2016 Method: NIOSH 1606 400/200mg Sampling Parameter: Air Volume Not Provided Result RL (mg/sample) Result (mg/m²) Result (ppm) Analyte (mg/sample) NA 0.010 <0.010 NA Acetonitrile

Result (mg/m²)

NA

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah. 84123 USA ILS GROUP USA, COST. An ALS Limited Company

Result

< 0.010

(mg/sample)

+1 801 266 7700

Result (ppm)

NA

RL (mg/sample)

0.010

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PHONT SOLUTIONS

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IHREP-V12.3

Analyta

Acetonitrile



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ANALYTICAL REPORT

IHREP-V12.3

Workorder: 34-1625967
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

	000 Jan		Project Manager	: Rand Potter	
	alzulia				
Sample ID: S16T921654 Lab ID: 1625967004					d: 09/10/2016 d: 09/15/2016
Method: NIOSH 1606	Serv		C 226-09, Charcoal 1/200mg		d: 09/15/2016
	Result			The section is	
Analyte Acetonitrile	(mg/sample) <0.010	Result (mg/m²)	Result (ppm)	RL (mg/sample) 0.010	- 12
		IVA	INA	0.010	
9 0476 Sample ID: \$16702 655 Lab ID: 1625967005	9 (24(16				d: 09/10/2016 d: 09/15/2016
Method: NIOSH 1606	900		C 226-09, Charcoal //200mg		d: 09/15/2016
	Result	pling Parameter, Air			
Analyte	(mg/sample)	Result (mg/m*)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	
9 augs	9/26/14				
Sample ID: S16T02X656				Collecte	d: 09/10/2016
Lab ID: 1625967006				Receive	d: 09/15/2016
Method: NIOSH 1606	San		C 226-09, Charcoal 1/200mg		d: 09/15/2016
	Result	nging rassinciat. An	volume Not Florit		- 3
Anslyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	Z
Acetonitrile	<0.010	NA	NA	0.010	
9 own	9/24/14				
Sample ID: \$16T02\657				Collecte	d: 09/10/2016
Lab ID: 1625967007				Receive	d: 09/15/2016
Method: NIOSH 1606		400	C 226-09, Charcoal 1/200mg		d: 09/15/2016
	San Result	ipling Parameter: Air	Volume Not Provid	ded	
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	
9 cum	9/20/16				
Sample ID: \$16T02\658	Harris			Collecte	d: 09/10/2016
Lab ID: 1625967008					d: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal /200mg	1000 C	d: 09/15/20 16
	Result.	pling Parameter: Air	volume Not Provid	ded	1 100
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Acetonitrile	<0.010	NA	NA	0.010	

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ANALYTICAL REPORT

IHREP-V12.3

Workorder: 34-1625967

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Patter

			Project Manager:	Rand Potter
Analytical Results 9 مرسة	9/26/14			
Sample ID: \$16T02\\$59 Lab ID: 1625967009				Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		400.	226-09, Charcoal 200mg	
	Result	npling Parameter: Air	Volume Not Provid	led.
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
9 00%	9/26/14			
Sample ID: \$16T02\$660				Collected: 09/10/2016
Lab ID: 1625967010				Received: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal 200mg	
	San Rasult	npling Parameter: Air	Volume Not Provid	led
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
9 cust	alzalu.			
Sample ID: \$16T02\661	1100110	1000		Collected: 09/10/2016
Lab ID: 1625967011				Received: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal 200mg	
	San Rezult	npling Parameter: Air	Volume Not Provid	led
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/semple)
Acetonitrile	<0.010	NA	NA	0.010
9 007/	9/26/14			
Sample ID: \$16702 662	1,04,10			Collected: 09/10/2016
Lab ID: 1625967012				Received: 09/15/2016
Method: NIOSH 1606			226-09, Charcoal 200mg	Tube Analyzed: 09/16/2016
		npling Parameter: Air '	Volume Not Provid	ed
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ripm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
9 evyl	a lecolus			
Sample ID: \$16T02\\$663	Hadia			Collected: 09/10/2016
Lab ID: 1625967013				Received: 09/15/2016
Method: NIOSH 1606		400	226-09, Charcoal 200mg	AMERICAN AND AND AND AND AND AND AND AND AND A
	San Result	npling Parameter: Air	Volume Not Provid	ed
Analyte	(mg/sample)	Result (mg/m³)	Rosutt (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

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ANALYTICAL REPORT

IHREP-V12.3

Workorder: 34-1625967
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rei9
Project Manager: Rand Potter

0 000 000 0 2 2	1.1		Project Manager: Rand	d Potter
Analytical Results 9 earl Sample ID: S16T021664 Lab ID: 1625967014	9/26/16		i II	Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		400/	226-09, Charcoal Tube 200mg	Analyzed: 09/16/2016
	Result	npling Parameter: Air \	Volume Not Provided	
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm) Rt. (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
المودن و	alzeku			
Sample ID: \$16T02\$665 Lab ID: 1625967015				Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		400/	226-09, Charcoal Tube 200mg	Analyzed: 09/16/2016
NIE - A - SA	Result	npling Parameter, Air \	Volume Not Provided	SERVICE STATE OF THE
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
9 0006	9/26/14			
Sample ID: \$16T02\666 Lab ID: 1625967016	- ibairé			Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606		400/	226-09, Charcoal Tube 200mg	Analyzed: 09/16/2016
	Result	npling Parameter, Air \	Volume Not Provided	
Analyte	(mg/sample)	Result (mg/m³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
المحدد 9	9/26/14			
Sample ID: \$16702x667	1100111			Collected: 09/10/2016
Lab ID: 1625967017				Received: 09/15/2016
Method: NIOSH 1606		400/	226-09 Charcoal Tube 200mg	Analyzed: 09/16/2016
	Result	npling Perumeter: Air \	Volume Not Provided	
Analyta	(mg/sample)	Result (mg/m²)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010
9 0076	9/24/14			
Sample ID: \$16T02\668 Lab ID: 1625967018	(£2		Collected: 09/10/2016 Received: 09/15/2016
Method: NIOSH 1606			226-09, Charcoal Tube 200mg	Analyzed: 09/16/2016
Name of the Party of the	Result	npung estamater: Air t	rolulle Not Provided	
Analyte	(mg/sample)	Result (mg/m²)	Result (ppm) RL (mg/sample)
Acetonitrile	0.015	NA	NA	0.010

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Workorder: 34-1625967

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results 9 cont 9/26/16

Acetonitrile	< 0.010	NA.	NA	0.01	0
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1606	San		226-09, Charcoal 200mg Volume Not Provid		lyzed; 09/16/2016
Sample ID: \$16702\(669 \) Lab ID: 1625967019					ected: 09/10/2016 eived: 09/15/2016

Sample ID: \$16T02(670 Collected: 09/10/2016 Lab ID: 1625967020 Received: 09/15/2016 Mathod: NIOSH 1606 Media: SKC 226-09, Charcoal Tube Analyzad: 09/16/2016 400/200mg Sampling Parameter: Air Volume Not Provided Result Result (mg/m²) Result (ppm) RL (mg/sample) Analyto (mg/sample) Acetonitrile <0.010 NA 0.010

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	TIII)
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 Levoy Drive Salt Lake City, Utah 84123 Phone: (801) 266-7700

Email: alsit.lab@ALSGlobal.com

Web: www.alsslc.com

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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. 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/
	lowa	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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:	CANTON AND ADMINISTRATION ADMINISTRATION ADMINISTRATION AND ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMINISTRATION ADMI		PATRICULAR AND
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.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 Propared By: NA Analysis: IH GC-FID QC

Bakch: IFID/7758 (HBN: 176711)

Analyzed By: Young Hee Yoon

Blank

MB: 518329

Analyzed: 09/15/2016 00:00

Units: mg/sample

Analyte Result MOU ND 0.0100 NA Acetonitrile

MB: 518332

Analyzed: 09/15/2016 00:00

Units: mg/sample Analyte Result MD ND NA 0.0100 Acetonitrile

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 518330 Analyzed: 09/15/2016 00:00 Dilution: 1 Units: mg/sample						LOSD: 51 Analyzed: 09 Dilution: 1 Units: m		0.00		-
Analyte	Result	Tørget	% Rec	QC L	mita	Resilit	% Req	RPD	QC LI	mits
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: 5 Analyzed: 0 Ullublan: 1 Units: m		0.00	
Analyte	Result	Target	% Rec	CC Limits	Result	A Rec	RPD	QC Limits

104

86.6 115.3

0.250 QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Young Hee Yoon	/S/ Steven J. Sagers
09/22/2016 11:23	09/22/2016 12:03

0.259

Symbols and Definitions

Acetonitrile

- * Analyte above reporting limit or outside of control limits
- A 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 - Rabilios % Difference (Spike / Spike Duplicate)

0.244

ND - Not Datected (11 - Qualifier also flags analyte as not detected)

97.8

0.0

20.0

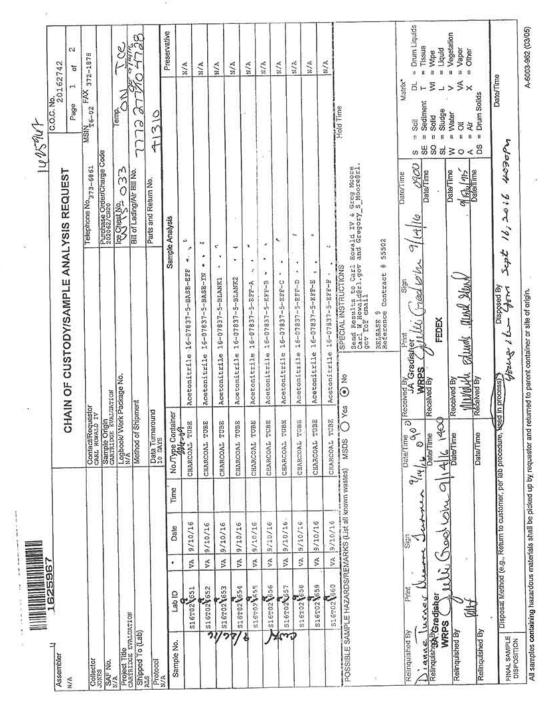
5.96

NA - Not Applicable

QC results are not adjusted for moisture correction, where applicable

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QCS V4.1



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Constitution Cons							CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	ALYSIS REQUEST	Page 2 of	2
Surgeous	Collector						Contact/Request	or	Telephone No.373-6861	MSIN FAX	60
Date Time No.779.0.3 Sumptoon Date Time No.779.0.3 No. 7770.0.3 No. 7770.0.3	SAF No.						Sample Origin	MILON	Purchase Order/Charge Code 202062/CB20		
Date Time NotTrope Containent Date Time Date	Project Title	UNTION					Logbook/ Work F	Package No.	loe Chest No.	1	Q
Surge No. Lab Date Time No. Type Container Surge Analysis Surge	Shipped To (La	(qu					Method of Shipm	ent	Bill of Lading/Air Bill No.	1,50	4728
Date Time No/Type Container Sample Analysis	Protocol						Data Turnaroune 10 pays			41310,	
662 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-6 (663 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-8 (664 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-8 (665 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-8 (666 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-8 (667 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-6 (668 VA 9/10/16 CHARGOAL TUBE Acetonitrile 16-07837-5-EFF-8 (669 VA 9/10/16 CHARGOAL TUBE ACETONITRIA (669 VA 9/10/16 CHARGOAL WATCH (669 VA 9/10/16 CHARGOAL	Sample No.	Lab	0	•	Date	Time	No./Type Container		mple Analysis	Presi	Preservative
663 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-A.* 664 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-A.* 665 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 666 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 667 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 668 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 669 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 670 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 671 WA 9/10/16 CERACOAL TUBE Accondition 16-07837-5-18-B.* 672 WA 9/10/16 CERACOAL TUBE ACCONDITION ACCONDITION ACCOUNTY 16-07837-5-18-B.* 673 WA 9/10/16 CERACOAL TUBE ACCONDITION ACCOUNTY 16-07837-5-18-B.* 674 WA 9/10/16 CERACOAL TUBE ACCONDITION ACCOUNTY 16-07837-5-18-B.* 675 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 676 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 677 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 678 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 679 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 670 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 670 WA 9/10/16 CERACOAL TUBE ACCOUNTY 16-07837-5-18-B.* 670 WA 9/10/16 CER		\$16702	199	VA			CHARCOAL TUBE	Acetonitrile 16-07837-5-EFF-G .	ز	N/A	
663 VA 9/10/16 CRARCOLL TUBE Acetolitzile 16-07837-9-TR-B		\$316702	662	22			CHARCOAL TUBE			N/N	
665 VA 9110/16 CERROLL TUBE Accontation 16-07837-5-IN-D. 666 VA 9110/16 CERROLL TUBE Accontation 16-07837-5-IN-D. 667 VA 9110/16 CERROLL TUBE Accontation 16-07837-5-IN-D. 668 VA 9/10/16 CERROLL TUBE Accontation 16-07837-5-IN-D. 669 VA 9/10/16 CERROLL TUBE ACCONTATION 16-07837-5-IN-D. 660 VA 9/10/16 CERROLL TUBE ACCONTATION 16-07837-1-IN-D. 660 VA 9/10/16 CERROLL TUBE ACCONTATION 16-07837-1-		S16T02	663				CRARCOAL TUBE	Acetonitrile 16-07837-5-IN-A.	•	N/A	
See		S16T02	199	×	91/01/6		CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-B		N/A	
Sign	1	S16702	1665	5	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-C .		N/A	
Segn Va 9/10/16 CERACOAL TUBE Acetonitrile 16-07837-5-IN-F		\$16102	9991	S			CHARCOAL TOBE	Acetonitrile 16-07837-5-IM-D .	v	N/A	
See VA 9/10/16 CERRCOAL TUBE Acetonitrile 16-07837-5-IR-G Acetonitrile 16-		5 816202	1991	K			CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-B .	1	N/A	
Separation (e.g., Return to customer, per lab procedure, User Received By 100		S16T02	899	K.	9/10/16		CHARCOAL TUBE	Acetonitrile 16-07837-5-IN-F 4	,	N/A	
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PEDEX Section PEDEX PEDEX PEDEX Society So	Relinquished	By WONEY	ES	3	Sign	9-	Date/Time Re	Wil rachor	14/16 OSCO	Matrix* = Soil DL = Sediment T	n Uqui
Disposal Method (e.g., Return to customer, per lab procedure, used in process). Disposad By Disposad By Carry VA, 2-51/2, 26.9.	WR Refinquished	Stadishe PS /g	(AD x	is	Grash		14∬C 14∞C Date/Time	EdundS	T	= Solid WI = Sludge L = Water V = Oil VA	id etation or sr
Disposal Method (e.g., Return to customer, per lab procedure, used in process)?	Relinquished	By						eceived By	_	1	
	FINAL SAMPLE	-	Method	(e.g.,	Return to cus	tomer, per	lab procedure, used in	Grang War Grand	Sept 16,2016 10230pe		

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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



Prepared for:

washington river protection solutions

Joyce A. Caldwell Washington River Protection Solutions, Inc. P.O. Box 850 Richland, WA 99352 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

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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

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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 $0.05~\mu g$ 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).

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	ug/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	ug/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	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-07837-6-EFF-B	Resin	S16T029318	Mercury	ug/sample	103	< 0.0500	< 0.0500	0.0500
16-07837-6-EFF-B	Glass W∞l	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	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-07837-6-EFF-D	Resin	S16T029324	Mercury	ug/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	ug/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	ug/sample	103	<0.0500	< 0.0500	0.0500
16-07837-6-EFF-F	Total	S16T029329	Mercury	ug/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	ug/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	ug/sample	103	< 0.0500	<0.0500	0.0500
16-07837-6-EFF-H	Total	S16T029335	Mercury	ug/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	ug/sample	103	< 0.0500	<0.0500	0.0500
16-07837-6-IN-A	Total	S16T029338	Mercury	ug/sample	n/a	< 0.0500	0.159	0.0500
16-07837-6-IN-A	Resin	S16T029339	Mercury	ug/sample	103	< 0.0500	0.154	0.0500
16-07837-6-IN-A	Glass Wool	S16T029340	Mercury	ug/sample	103	< 0.0500	< 0.0500	0.0500
16-07837-6-IN-B	Total	S16T029340	Mercury	ug/sample	n/a	< 0.0500	0.170	0.0500
16-07837-6-IN-B	Resin	S16T029341	Mercury	μg/sample	103	< 0.0500	0.165	0.0500
16-07837-6-IN-B	Glass Wool	S16T029342	Mercury	μg/sample	103	< 0.0500	< 0.0500	0.0500
16-07837-6-IN-C	Total	S16T029343	Mercury	μg/sample μg/sample	n/a	< 0.0500	0.144	0.0500
16-07837-6-IN-C	Resin	S16T029344 S16T029345	Mercury	ug/sample	103	< 0.0500	0.144	0.0500
16-07837-6-IN-C	Glass Wool	S16T029345	Mercury	ug/sample	103	< 0.0500	< 0.0500	0.0500
16-07837-6-IN-D	Total	S16T029346 S16T029347	Mercury	ug/sample	n/a	< 0.0500	0.138	0.0500
16-07837-6-IN-D	Resin	S16T029347 S16T029348	Mercury	ug/sample	103	< 0.0500	0.138	0.0500
16-07837-6-IN-D	Glass Wool	S16T029348 S16T029349	Mercury	ug/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	ug/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-EEF	Total	S16T029362	Mercury	µg/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-BASE-EEF	Resin	S16T029363	Mercury	μg/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-BASE-EEF	Glass Wool	S16T029364	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-BASE-IN	Total	S16T029365	Mercury	ug/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	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-BLANK-EFF	Total	S16T029368	Mercury	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-BLANK-EFF	Resin	S16T029369	Mercury	ug/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	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-BLANK-IN	Resin	S16T029372	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-BLANK-IN	Glass Wool	S16T029373	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-A	Total	S16T029374	Mercury	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-A	Resin	S16T029375	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-A	Glass Wool	S16T029376	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-B	Total	S16T029820	Mercury	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-B	Resin	S16T029821	Mercury	ug/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	ug/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	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-D	Glass Wool	S16T029828	Mercury	ug/sample	97.1	< 0.0500	<0.0500	0.0500
16-08068-6-EFF-E	Total	S16T029829	Mercury	ug/sample	n/a	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-E	Resin	S16T029830	Mercury	ug/sample	97.1	< 0.0500	<0.0500	0.0500
16-08068-6-EFF-E	Glass Wool	S16T029831	Mercury	ug/sample	97.1	< 0.0500	< 0.0500	0.0500
16-08068-6-EFF-F	Total	S16T029832	Mercury	ug/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	ug/sample	n/a	<0.0500	0.115	0.0500
16-08068-6-EFF-H	Resin	S16T029839	Mercury	ug/sample	94.6	< 0.0500	0.110	0.0500
16-08068-6-EFF-H	Glass Wool	S16T029840	Mercury	ug/sample	94.6	< 0.0500	<0.0500	0.0500

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20162725 Rev. 0

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	ug/sample	94.6	< 0.0500	< 0.0500	0.0500

Attachment 2

ANALYSIS DATE REPORT

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	09/14/201610:00	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

Attachment 3

RECEIPT PAPERWORK

222-S		CEIPT AND CHAIN OF CUSTODY RIFICATION CHECKLIST ATS-LO-090-101 Rev						
Date Samples Rece Sample Custodian:	/\	TO		lumbe	or of Samples: 478 Gr IH Technician: 7	oup# 20162725-6		
	Complete 100			Custo	odian to Complete:			
· A	ction	Yes	No	N/A		Comments		
		-				- Commonto		
RSR provided?				-				
Verify GKI is complete	9			-	☐ In Project File			
Received from an alpl	ha facility?		-		Contact PC for approval	to release		
Check that outer custo present	ody seal is intact, if	.,		-				
Record cooler temper appropriate	ature in centigrade, as	500			Check if no cooler and/or	r no ice		
Samples are intact an	nd in good condition	-			If No, provide comments belo	w		
RSA/COC provided a the following informati	nd complete containing ion?							
Client name as	nd client sample number	-						
Date and time	of sampling	~			a/			
Sampling loca	tion or origin	~						
Container type	e, size, and number	~						
Preservatives COC/RSA and	(if used) noted on the sample bottles	1		-				
 Analysis reque 	est is clear	-						
 Signature of preceiving same 	ersons relinquishing and ples	-						
 Date and/or tir exchange 	me of sample custody	~						
Verify that sample numerich the COC and/o	mbers on containers or RSA	-						
Samples stored prope	erly (e.g., refrigeration)	~	ł					
	diately if any problems low is completed by the					PC resolution. For WRPS samples,		
	e for release? <u>yes</u> communication and res WR ran Tube uples Received:	olution PS	51 R	HIP un	280 118 80 (40NHs to Acedon, frile			
Aldehyde Screen: _		40		Ammor		: Asbestos:		
Beryllium:	Be-Bulk:	7	-8	Be-Fil				
				Mercu				

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: W	1/- A		20		_	mpled:	9/11	0/16
CACN: 2020	000	COA:CB		No.: 16-07837		-		-
Contact Name:	A SET THE PROPERTY OF THE	2000	Phone: (509)373-4966	The second	Turnaroui	/	VI	and the same
Return Report	O: Caldwell, Joy	ce A		MSIN: F	R1-06	Phone:	(509)3	76-0737
Laboratory Log No.	Sample ID/Ty	pe/Description			Requi	red Analy	sis	
5167029302	16-07837-6-B		Irar (SKC 226-17-1A) 5(C702 		Hg-El	emental S	Source	
SW1019305	16-07837-6-B		r (SKC 226-17-1A) \$ 516-T02	9306	Hg-El	emental S	Source	
S167079 308				1316	Hg-Eli	emental S	Source	
5117029311	I TERRITORING BELLEVIO	OTHER COUNTY OF WHAT IN	(SKC 226-17-1A) SIC 702	9312	Hg-Ele	emental S	Source	
5167029314	16-07837-6-E	FF-A / Hydrar (& u 	SKC 226-17-1A) 5,16702 19-1376 SL6-7025 11111111111 S16-7025		Hg-Ele	emental S	ource	
S16T029317		FF-B / Hydrar (SKC 226-17-1A) \ Slu-7029 		Hg-Ele	emental S	Source	
5167029320	16-07837-6-E	FF-C / Hydrar (SKC 226-17-1A) .	321	Hg-Ele	emental S	ource	
S67028323	16-07837-6-E	FF-D / Hydrar (SKC 226-17-1A) . 516 TO29.	324	Hg-Ele	emental S	curce	
Special Instruction	ons:							31111
		Signature	Printed Name	Locat	ion	Date		Time
Delivered to Stor	age: N	r	NYAN BURUS	2704 HV	4104	9/10/	16	0631
Retrieved from S	torage: CM	00N	Christie Mask		17.1	9/10/	16	057
	Sig	nature	Printed Nan	ne	Da	ate	. (1	Time
		77574	Chasto mo	ON	911	2/16	12	30
Relinquished By:	CM				4 4 4	7		
No. and the same of the same o	een	lalil	Sharon Lilal	de	9.12.	16	13	30
Received By:	ghi	lalil	Sharon Lilol	de	9.12	14	13.	30
Received By: Relinquished By:	ghi	lalu	Sharon Lilol	de	9.12.	16	13.	30
Received By: Relinquished By: Received By:	glici	lalu	Sharon Ludol	d.	9.12.	16	13.	30
Relinquished By: Received By: Relinquished By: Received By: Relinquished By: Received By:	glici	lalil	Sharon Lilol	de	9.12.	16	13.	30

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Was	shington River Pro	tection Solutions					D	ate Sa	mpled:	1/1	0/16
CACN: 2020	690	COA: E	32	0	Survey	No.: 16-078	37 - Car	tridge Te	esting		
Contact Name:	Jones, Parker L			Phone:	(509)373-4966		Turn	naroun	d: N/	4	
Return Report To	o: Caldwell, Joy	ce A				MSIN:	R1-06		Phone:	(509)	376-0737
Laboratory Log No.	Sample ID/Ty	pe/Description					R	equire	d Analysi	s	*
slu 1029326		FF-E / Hydrar		5	1676293 1676293	27 28	H	g-Elem	ental So	urce	
516 7029 329	16-07837-6-E	FF-F / Hydrar	(SKC	5	A) . 3167029 =	30	H	g-Elem	ental So	urce	
216 TO29 332	Committee of the Commit	FF-G / Hydrar		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	1A) 1 16-T0293 16-T0293		H	g-Elem	ental So	urce	
5167029335		FF-H / Hydrar		<	11-10293	36 37	H	g-Elem	ental So	urce	
slb 1029 338	16-07837-6-1	N-A / Hydrar (S	KC 2	26-17-1A るし		39	H	g-Elem	ental So	urce	
5167029341		N-B / Hydrar (S		21	670293		H	g-Elem	ental So	urce	
S167029 344	16-07837-6-II	N-C / Hydrar (S		26-17-1A SIG		15	H	g-Elem	ental So	urce	
SULT029 347	16-07837-6-1	N-D / Hydrar (S	KC 2	26-17-1A 31		48	H	g-Elem	ental So	urce	
Special Instruction	ns:					70		7			
		Signature	T	Printe	d Name	Loc	cation		Date		Time
Delivered to Stora	ge: /	n		RYAN	BURNS	2704 H	V H	104	9/10/1	6	0639
Retrieved from St	orage: CM	oon	C	hust	ie Moon				9/12/	16	105
	Sign	nature			Printed Nan	ne		Da	te		Time
Relinquished By:	Cmo	M		Ch	rishe	moon	ال	9/1	2/16	1:	330
Received By:	leniu	du	6	haron	Lulol	len	0	1:12	-16	13	3 30
Relinquished By:											
Received By:											
Relinquished By:									The state of		
Received By:											
Additional Comme	ents:									-	

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

CACN: 903	deg coa: C	Bally Survey	No.: 16-07837	Cartridge T	esting	
Contact Name:	STITUS AT INC. ST. CO. ST.	Phone: (509)373-496	6	Turnarour	nd: A	(A
Return Report To	Caldwell, Joyce A		MSIN: R	1-06	Phone:	(509)376-0737
Laboratory Log No.	Sample ID/Type/Description	n		Require	d Analysi	s
5167029350	16-07837-6-IN-E / Hydrar (51670293	51 52	Hg-Eler	mental So	urce
516/029353	16-07837-6-IN-F / Hydrar (54	Hg-Eler	nental So	urce
5167029 356	16-07837-6-IN-G / Hydrar ((SKC 226-17-1A) '	57	Hg-Eler	nental So	urce
SIGT029359	16-07837-6-IN-H / Hydrar (SKC 226-17-1A) ,	60	Hg-Eten	nental So	urce
	16-07837-7-BASE-EFF / C	ISA (SKC 226-29)		NH3-So	urce	
	16-07837-7-BASE-IN / CIS	A (SKC 226-29)		NH3 So	urce	
	16-07837-7-BLANK1 / CIS		•	NH3 So	urce	
				-	100	
	16-07837-7-BLANK2 / CIS			NH3 So	orce	
Special Instruction				1-		
	Signature	Printed Name	Locati	on	Date	Time
Delivered to Stora	ge: / /	RYAN BUKNS	2704 HU	1+104	9/10/1	6 0639
Retrieved from Sto	orage: CMÓSY	Christemon	(9/12	14 105
	Signature	Printed Na	me	Da	ite	Time
Relinquished By:	CMOON	Chuston	2000	9/1	2/16	1330
Received By:	Milabel	Shaven Lilo	ldu	9-12	10	1330
Relinquished By:						
Received By:						
Relinquished By:						
Received By:						
Additional Comme	ents:					

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Wa	shington River Pr	otection Solutions			Date Sa	mpled: 9	10/16
CACN: 202	062	COA: CB	Survey	No.: 16-0806	8 - Cartridge To	esting \$	913.10
Contact Name:	Jones, Parker L		Phone: (509)373-4966	1	Turnaroun	d: N//	7
Return Report 1	Caldwell, Jo	yce A		MSIN:	R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Ty	pe/Description			Requi	red Analys	sis
Shot 036362.	TANK MENTERS FOR BALLEY		r (SKC 226-17-1A) . SIGTO IIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIIII	29369	Hg-El	emental S	ource
N61029365.	16-08068-6-B		SKC 226-17-1A) : Sle702 [Hg-El	emental S	ource
3167029368.			ar (SKC 226-17-1A) , S 16 7 S 16 T	029369	Hg-Et	emental Se	ource
5/67029371.	WAS ALLOWED BOOK OF STREET	LANK-IN / Hydrar	(SKC 226-17-1A);	29372	Hg-El	emental So	ource
5167029375.	16-08068-6-E	FF-A / Hydrar (Sh		375	Hg-El	emental So	ource
516 1029 820.		FF-B / Hydrar (Sk	C 226-17-1A), SIG TO 29	821	Hg-El	emental So	ource
SI6TOZG 823.		FF-C / Hydrar (Sh	5167029	The second	Hg-El	emental So	ource
5167029 826.	16-08068-6-E	FF-D / Hydrar (Sh		827	Hg-El	emental S	ource
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Received By:	llurae	Junaer	DIANNE TURN	ER	9-1	2-16	13:30
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Additional Comn	nents:						V

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Laboratory Log No. Sample ID/Type/Description Required Analysis Hg-Elemental Source 16-08068-6-EFF-E / Hydrar (SKC 226-17-1A)	ontractor: Wash	ington River Prot	ection Solutions				Date San	npled:	9/10	1110
Return Report To: Caldwell, Joyce A	ACN: 2020	x02	COA: C	320	Survey No.	16-08068 -	Cartridge Te	sting	7,,,,	, , ,
Laboratory Log No. Sample ID/Type/Description Required Analysis Hg-Elemental Source 16-08068-8-EFF-E / Hydrar (SKC 226-17-1A) SLG 70A 830 Hg-Elemental Source SLG 70A 9830 Hg-Elemental Source SLG 70A 9834 Hg-Elemental Source SLG 70A 9837 Hg-Elemental Source SLG 70A 9834 Hg-Elemental Source SLG 70A 9843 Hg-Elemental Source SLG 70A 9845 Hg-Elemental Source Hg-Elemental Source SLG 70A 9845 SLG 70A 9845 Hg-Elemental Source Hg-Elemental Source SLG 70A 9845 Hg-Elemental Source SLG 7	ontact Name: J	ones, Parker L		Phone: (5	09)373-4966	1	Turnaround	1: N	A	
Log No. Sample ID/TyperDescription Required Analysis 16-08068-6-EFF-E/Hydrar (SKC 226-17-1A)	eturn Report To	: Caldwell, Joyc	ce A			MSIN: R	1-06 F	hone:	(509)3	76-0737
16-08068-6-EFF-F / Hydrar (SKC 226-17-1A) SLG 70.2 9.834 Hg-Elemental Source SLG 70.2 9.834 Hg-Elemental Source SLG 70.2 9.835 Hg-Elemental Source SLG 70.2 9.837 Hg-Elemental Source SLG 70.2 9.840 Hg-Elemental Source SLG 70.2 9.840 Hg-Elemental Source SLG 70.2 9.840 Hg-Elemental Source SLG 70.2 9.843 Hg-Elemental Source SLG 70.2 9.853 SLG 70.2 9.853 SLG 70.2 9.853 SLG 70.2 9.853 Hg-Elemental Source Hg-Elemental Source SLG 70.2 9.853 Hg-Elemental Source Hg-Elemental Source SLG 70.2 9.853 Hg-Elemental Source SLG 70.2 9.853 Hg-Elemental Source Hg-Elemental Source SLG 70.2 9.853 Hg-Elemental Source Hg-	og No	Sample ID/Typ	pe/Description	i.			Required	Analys	is	
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16-08068-6-EFF-H / Hydrar (SKC 226-17-1A) S16 T 0.2 9 8 9 7 Hg-Elemental Source S16 T 0.2 9 8 4 3 Hg-Elemental Source Hg-Elemental Source Hg-Elemental Source Hg-Elemental Source S16 T 0.2 9 8 4 6 Hg-Elemental Source Hg-Elemental Source Hg-Elemental Source S16 T 0.2 9 8 9 6 Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source S16 T 0.2 9 8 5) Hg-Elemental Source Hg-Elemental Source S16 T 0.2 9 8 5) S16 T 0.2 9 8 5) Hg-Elemental Source Hg-Elemental Source S16 T 0.2 9 8 5) S16 T 0.2 9 8 5) Hg-Elemental Source Hg-E	61029835.			Su	CO 2907		Hg-Eleme	ental So	ource	
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16-08068-6-IN-C / Hydrar (SKC 226-17-1A) Stu-7029 8 49 16-08068-6-IN-D / Hydrar (SKC 226-17-1A) Stu-7029 8 49 16-08068-6-IN-D / Hydrar (SKC 226-17-1A) Stu-7029 8 5) Stu-7029 8 5) Stu-7029 8 52 Special Instructions: Signature Printed Name Location Date Delivered to Storage: Children Childre	16T029844.			516			Hg-Eleme	ental Sc	urce	
Special Instructions: Signature	6T029847.			56			Hg-Eleme	ental Sc	urce	
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INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Wa	shington River Pro	tection Solution	-				Dat	te Sar	npled:	7/10	116
CACN: 202	062	COA:	CB	20_	Survey I	No.: 16-080	68 - Cartri	idge Te	sting	1	
Contact Name:	Jones, Parker L			Phone:	(509)373-4966		Turna	round	1: My	MA	
Return Report 1	o: Caldwell, Joy	œ A				MSIN:	R1-06	F	hone:	(509)3	76-0737
Laboratory Log No.	Sample ID/Typ	e/Descriptio	n				R	equire	d Analys	is	
SULT 629853.	16-08068-6-IN			SIC	7029 85 7029 85		H	g-Elen	nental So	ource	
5167029856	16-08068-6-IN			516	702985	57 58	H	g-Elen	nental So	ource	
167029859.	16-08068-6-IN			511	TADASE	0	H	g-Elen	nental Sc	ource	
5167029862	16-08068-6-IN	-H / Hydrar (SKC 2	26-17-1A	70298	43	H	g-Elen	nental So	ource	
	16-08068-7-B		102		Carte		NI	H3 So	urce		
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	16-08068-7-B	ASE-IN CIS	A (SKC	226-29)			NI	H3 So	urce	00	
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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



Prepared for:

washington river protection solutions

Joyce A. Caldwell Washington River Protection Solutions, Inc. P.O. Box 850 Richland, WA 99352 509-376-0737 Prepared by:



WAI Hanford Laboratory 1955 Jadwin Ave, Suite 330 Richland, WA 99354 509-373-3240

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
	138-DA SESTAN COLOTA PARA DECISIONATO DE	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

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

20162724 Rev. 0

subtraction was performed. The client-requested reporting limit is $10~\mu g$ 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 $10~\mu g$ 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).

Attachment 1

DATA SUMMARY REPORT

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	ug/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	ug/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	ug/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	ug/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	ug/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	S16T029904	Ammonia	ug/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	ug/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	ug/sample	n/a	<10.0	2.91E+03	500
16-07837-7-IN-D	Front Resin	S16T029910	Ammonia	µg/sample	101	<10.0	2.91E+03	500
16-07837-7-IN-D	Back Resin	S16T029911	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	ug/sample	92.6	<10.0	<10.0	10.0
16-08068-7-BLANK-EFF	Total	S16T029931	Ammonia	ug/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	ug/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	ug/sample	92.6	<10.0	2.71E+03	500
16-08068-7-IN-A	Back Resin	S16T029939	Ammonia	ug/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	ug/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 μg/sample	92.6	<10.0	2.79E+03	500
16-08068-7-IN-F	Back Resin	S16T029954	Ammonia	μg/sample μg/sample	92.6	<10.0	<10.0	10.0
16-08068-7-IN-G	Total	S16T029955	Ammonia	μg/sample μg/sample	n/a	<10.0	2.85E+03	500
16-08068-7-IN-G	Front Resin	S16T029956	Ammonia	μg/sample μg/sample	105	<10.0	2.85E+03	500
16-08068-7-IN-G	Back Resin	S16T029956 S16T029957	Ammonia	μg/sample μg/sample	105	<10.0	<10.0	10.0
16-08068-7-IN-H	Total	S16T029957 S16T029958	Ammonia	ug/sample	n/a	<10.0	2.57E+03	500
16-08068-7-IN-H	Front Resin	S16T029958 S16T029959	Ammonia	μg/sample μg/sample	n/a 92.6	<10.0	2.57E+03	500
16-08068-7-IN-H	Back Resin	S16T029959 S16T029960	Ammonia	μg/sample μg/sample	92.6	<10.0	<10.0	10.0

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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
16-08068-7-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

Attachment 2

ANALYSIS DATE REPORT

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	09/14/201617:00	09/15/2016 01:15

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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	09/14/201617:00	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	09/14/201617:00	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	09/14/201617:00	09/15/2016 21:09
S16T029975	16-08068-7-EFF-E	Ammonia	09/14/201617:00	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

Attachment 3

RECEIPT PAPERWORK

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					Cartridge Testing NH3
222-S					HAIN OF CUSTODY HECKLIST ATS-LO-090-101 Rev DG-1
Date Samples Received	9-12-16	_ T	otal N	lumbe	r of Samples: 478 Group #: 20162724
Sample Custodian:	Janne Tus	ENE	R		IH Technician: (husemoon)
		Sai	nple	Custo	odian to Complete:
Action		Yes	No	N/A	Comments
RSR provided?				~	
Verify GKI is complete				-	☐ In Project File
Received from an alpha fac	cility?		-		Contact PC for approval to release
Check that outer custody s present	eal is intact, if			~	
Record cooler temperature appropriate	in centigrade, as	500			Check if no cooler and/or no ice
Samples are intact and in g	good condition	-			If No, provide comments below
RSA/COC provided and cothe following information?	mplete containing				
 Client name and cli 	ent sample number	-			
 Date and time of sa 	mpling	-			
Sampling location of	or origin	~			
Container type, size	e, and number	-			
 Preservatives (if us COC/RSA and sam 				-	
 Analysis request is 	clear	_			7
 Signature of person receiving samples 	s relinquishing and	~			
 Date and/or time of exchange 	sample custody	~			
Verify that sample numbers match the COC and/or RS.	s on containers A	~			
Samples stored properly (e	e.g., refrigeration)	~			1,15, 36
Notify the PC immediate the initials block below is					No" checked boxes require PC resolution. For WRPS samples, PS PC.
Samples acceptable for	release? ues	_	PC/S	C)nit	ials <u>du</u> Date <u>9-12-16</u>
If No, comment on comm	nunication and res	olution	_		000
	WR		SI R	t1P	118
Broken Furan Number of IH Samples		NHO	LF	\un	Acetonifile 40
Aldehyde Screen: 40	Amines:	40	_ ^	mmon	
Beryllium:	Be-Bulk:	./-	_	Be-Filt	
Formaldehyde:	Furans:	40	-	Mercu	
Nitrous Oxide:	Pyridines:	46	۷	SVC	A-6005-302 (REV

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

CACN:202	762 COA: C	BaO Survey	No.: 16-07837	- Cartridge T		iliolia
Contact Name:	Jones, Parker L	Phone: (509)373-4966		Turnarour	nd: n//	A
Return Report T	o: Caldwell, Joyce A		MSIN: F	R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Descripti	on		Require	d Analysis	
	16-07837-6-IN-E / Hydrar			Hg-Eler	mental Sou	rce
				11 71		
	16-07837-6-IN-F7-Hydrar			rig-Eler	mental Sou	rce
	16-07837-6-IN-G / Hydrar	(SKC 226-17-1A)		Hg-Eler	nental Sou	rce
		AN CON LINEAR ON THE				
	16-07837-6-IN-H / Hydrar			Hg-Eler	nental Sou	rce
	HOLDER OF THE OUT THE TO A 11 HOLDER OF	OT THE REAL PROPERTY.				_
5161029868	16-07837-7-BASE-EFF / C		702986C	THE RESERVED AND THE	ource	8
3161029868	16-07837-7-BASE-IN / CIS	attended to the same of the sa	29870		urce	
5161029871	16-07837-7-BLANK1 / CIS		6T0298 29873		urce .	
5167029874	16-07837-7-BLANK2 / CIS		29875	NH3 So	urce	
Special Instruction						
	Signature	Printed Name	Locat	ion	Date	Time
Delivered to Stora	ige: Jase Rom	JASON KEND	2904-HVI	4-104	9/10/16	0640
Retrieved from St	orage: MOON	Christiamood		-	9/12/11	1100
	Signature	Printed Nam	ne ,	Da	ite	Time
Relinquished By:	manu	Christemo	ow	alv	2/10	1830
Received By:	Shellald	Shapper Lilo	· ldu	9.12	16	13:30
Relinquished By:			W.			
Received By:		4				
Relinquished By:						
Received By:						
Additional Comme	ante:					

20162724 Rev. 0

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Was	hington River Pro		4 4					9 kolik	
CACN: 202	062	COA:C			o.: 16-07837 -				
Contact Name:			Phone:	(509)373-4966	1	urnarour	The Views		
Return Report To	Caldwell, Joy	ce A			MSIN: R	1-06	Phone:	(509)376-	0737
Laboratory Log No.	Sample ID/	Type/Descrip	tion	,		Requir	red Analy	sis	
516T029817	STATE OF THE STATE OF		A (SKC 226-29)	, SIGTO:	29878	NH3 S	Source	^	
5161029880	16-07837-7		A (SKC 226-29)	, S16T	29882	NH3 S	ource		
5161029883	16-07837-7		A (SKC 226-29)	· 516To	29884	NH3 S	ource .		
516702986	16-07837-7	The second secon	A (SKC 226-29)	1 5167	029887 29888	NH3 S	ource -		
5165029889	16-07837-7		A (SKC 226-29)	1 SIGT	29890	NH3 S	ource		
5167029892	16-07837-7		A (SKC 226-29) \	' SIGT	-019893 29894	NH3 S	ource .		
3167029895	16-07837-7		A (SKC 226-29)	, SIGTO	29896	NH3 S	ource		
5167029898	16-07837-7	-	A (SKC 226-29)		29900	NH3 S	ource		
Special Instruction	s:								
		Signature	Printed	Name	Location	on	Date	1	Time
Delivered to Storag	ge: Jan	Reve	JASON 6	CNO S	2704-40/	4-104	9/101	14 06	40
Retrieved from Sto	rage: OM	DON	Chast	MOON	State But		9/10/	16/11/	00
	Sign	nature	1 01	Printed Name		Da	te ,	Tim	ne
Relinquished By:	cmo	The same	Chi	wemo	82	9/1	2/16	133	0
Received By:	genin	latel	Sharo	- Lelol	h	9-12	-16	1330	3
Relinquished By:									
Received By:									
Relinquished By:									đ.
Received By:									

20162724 Rev. 0

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washin	ngton River Protection Solutions			Date Sa	ampled: 9	10/16	
CACN: 20206	a coa: C	Bao Survey	No.: 16-07837	- Cartridge T	esting		
Contact Name: Jo	nes, Parker L	Phone: (509)373-4966	å 1	Turnarour	nd: N/A		
Return Report To:	Caldwell, Joyce A		MSIN: R	R1-06	Phone: (5	09)376-0737	
Laboratory Log No.	Sample ID/Type/Descript	ion		Require	ed Analysis		
5165029901	16-07837-7-IN-A / CISA (3(8)0	29902	NH3 Sc	ource .		
5160029904	16-07837-7-IN-B / CISA (3161	29905	NH3 Sc	ource		
3161029907	16-07837-7-IN-C / CISA (SKC 226-29) SIGT	29908	NH3 Sc	ource	•	
5167029910	16-07837-7-IN-D / CISA (029911	NH3 Sc	ource		
5161029913	16-07837-7-IN-E / CISA (29915	NH3 Sc	ource		
5165029916	16-07837-7-IN-F / CISA (19161	29917	NH3 Sc	ource		
5167029919	16-07837-7-IN-G / CISA (29921	NH3 Sc	ource		
5165029922	16-07837-7-IN-H / CISA (SKC 226-29) , 5167	29924		NH3 Source		
Special Instructions:	it is						
	Signature	Printed Name	Locati	on	Date	Time	
Delivered to Storage	Jan Ran	JASON RENO	2704-HU/1	4-104	9/10/16	0640	
Retrieved from Stora	ge: CMOON	Chastemoon			9/12/1	6 1100	
	Signature	Printed Nar	ne	Da	ite	Time	
Relinquished By:	anon	(hreste	MOON	9/1:	1100 1	330)	
Received By:	letelalu	Shava Lup	1 du	9.12.	ic /2	30	
Relinquished By:							
Received By:							
Relinquished By:							
Received By:	*						
Additional Comments	:						

20162724 Rev. 0

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Wa	shington River Prote	ection Solutions				Date :	Sampled:	9/1	10/16
CACN: 200	1062	COA: CB	20	Survey No.	.: 16-0806	8 - Cartridge	Testing	,,,	1,0
Contact Name:	Jones, Parker L		Phone: (50	9)373-4966		Turnaro	und: W	1A	
Return Report T	o: Caldwell, Joyc	e A			MSIN:	R1-06	Phone:	(509)	376-0737
Laboratory Log No.	Sample ID/Typ	e/Description				Requ	ired Analy	/sis	
	16-08068-6-IN-	E / Hydrar (SKC	226-17-1A)			Hg-E	lemental :	Source	0
	MARTINIA							_	
	16-08068-6-IN-	F7Hydrar (SKC	226-17-1A)			Hg-E	lemental S	Source	Э
		mamami							
	16-08068-6-IN-	G / Hydrar (SKC	226-17-1A)			Hg-E	lemental S	Source	9
	MARMARK		III D D						
	16-08068-6-IN-	H / Hydrar (SKC	226-17-1A)			Hg-E	Temental S	Source	3
			STORE IN COL						
2028	16-08068-7-BA	SE-EFF / CISA	(SKC 226-29)			NH3	Source		
516T029928	I HAT HE DE WELLEN DE DE	TELL TELLEGISCHE AND	HIRMAN	:	29927				
2928	16-08068-7-BA	SE-IN / CISA (S	KC 226-29)	S16T02	9929	NH3	Source		
516/029928	masamaa	INTRABANA		2	19930				
. 9316	16-08068-7-BL	ANK-EFF / CISA	(SKC 226-29)	,			Source		
51670299316	manajaman 1	intmamiti	amanan	0 :	2993	3			
2934	16-08068-7-BL/	ANK-IN / CISA (SKC 226-29) .	SIGTO!			Source		
516T029934					29936	-			
Special Instruction									
	S	ignature	Printed N	ame	Loca	ation	Dat	e	Time
Delivered to Stora	ige: (hu	leman	(hastee	Max ?	27041	11/410	4 9/10/	10	0250
Retrieved from St	orage: CM	MOC	Charle	Moon		,	19/12	16	1154
							7	· ·	R R DD
	Signa	ature	Pr	inted Name		1	Date		Time
Relinquished By:	cmoon)	Chas	he MO	DIV	9/1	2/16	13	30
Received By:	dianne S	kinzen	DIALLE	TURNI	فيرك	9-	12-16	13	3:30
Relinquished By:						_		-	
Received By:						-			
Relinquished By:						-			
Received By:	l								
Additional Comme	ents:								

20162724 Rev. 0 INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Wash	ington River Protection Solutions			Date Sa	mpled:	1/10/16
CACN: 2.02	3062 COA: CE	Survey N	0.: 16-08068	Cartridge T	esting	/ /
Contact Name: J	ones, Parker L	Phone: (509)373-4966		Turna <i>r</i> ou	nd: N/	A
Return Report To:	Caldwell, Joyce A		MSIN: R	1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	on		Require	ed Analysis	3
5165029937	16-08068-7-IN-A / CISA (S		9938	NH3 S	ource	
516TO 2994	16-08068-7-IN-B / CISA (S	., 51610	29941 29942	NH3 Sc	ource	
5165029943	16-08068-7-IN-C / CISA (S		19944	NH3 Sc	ource	
516502994	16-08068-7-IN-D / CISA (S	01610.	29947 29948	NH3 Sc	ource	Н
516029949	16-08068-7-IN-E / CISA (S	NH3 Sc	ource	*		
516TO29 952	16-08068-7-IN-F / CISA (S	NH3 Source				
S161029955	16-08068-7-IN-G / CISA (S	, 5161021	95L 957	NH3 Sc	ource	
3165029958	16-08068-7-IN-H / CISA (S		959	NH3 Sc	ource	
Special Instructions:						
	Signature	Printed Name	Locati	on	Date	Time
Delivered to Storage	: Chustamon	("hostre Max)	STOULHU	11+104	9/10/16	0350
Retrieved from Stora		Christiamoon			19/011	61154
	Signature	Printed Name		Da	te	Time
Relinquished By:	moon	Christomo	OW	9/12	116	1320
Received By:	Guna Jurner	DANNE TURNER		9-13	-16	13:30
telinquished By:						
Received By:	200	-				
Relinquished By:						
Received By:						

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

	nington River Protection Solutions	100		Date Sampled:	9/10/16
CACN: 203	LOW & COA: C	100.0	lo.: 16-08068 - C	The state of the s	1/4
Contact Name:	The state of the s	Phone: (509)373-4968	T	rnaround:	1/4
Return Report To	: Caldwell, Joyce A		MSIN: R1-	06 Phone:	(509)376-0737
Laboratory Log No.	Sample ID/Type/Description	on	ranth.	Required Anal	ysis
5161029961	16-08068-7-EFF-A / CISA		29962 29963	NH3 Source	24.00
S16TO 29964	16-08068-7-EFF-B / CISA	, 510.	19965 19966	NH3 Source	
5165029967	16-08068-7-EFF-C / CISA		29968	NH3 Source	,
5167029970	16-08068-7-EFF-D / CISA	, 0,0	19971 29972	NH3 Source	
5165029913	16-08068-7-EFF-E / CISA	0.010	29975	NH3 Source	
5161029976	16-08068-7-EFF-F / CISA	(SKC 226-29) · S16TO.	29977	NH3 Source	
5165029979	16-08068-7-EFF-G / CISA	, 51010	29980	NH3 Source	
5165029982		210.0	19983 19984	NH3 Source	
Special Instructions					
	Signature	Printed Name	Location	Dat	e Time
Delivered to Storage Retrieved from Stor		Christemoon Christemoon	a704 Hu/	4104 9/10, 9/10	16 0as
	Signature	Printed Name	9	Date	Time
Relinquished By:	CMOON	Christian	1000	9-12-16	1330
eceived By:	Crane Fry sen	DIANNE TURNIER		9-13-16	13:30
elinquished By:					
eceived By:	(A)				
elinquished By:					
eceived By:					
dditional Commen					

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

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analytical Results					
Sample ID: S16T029571					Collected: 09/10/2016
Lab ID: 1625970001	Sa	ampling Location: CAF	RTRIDGE EVALUA	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	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	Sa	ampling Location: CAR	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
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

ADDRESS 960 West LeVoy Drive, Salt Lake City, Litah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

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Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results					
Sample ID: S16T029572					Collected: 09/10/2016
Lab ID: 1625970002	Sa	ampling Location: CAF	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge rophenylhydrazine) Volume Not Provid	and other	Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/	sample)
Acetone	69	NA	NA	1000	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	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
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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Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Arialytical Results					
Sample ID: S16T029574					Collected: 09/10/2016
Lab ID: 1625970004	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		Analyzed: 09/22/2016
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	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
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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Amended-20161004

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	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION F	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/san	nple)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	(0.050

Sample ID: \$16T029576 Lab ID: 1625970006	Sa	ampling Location: CAI	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016	
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/samp	le)	
Formaldehyde	<0.050	NA	NA	0.0	50	
Acetaldehyde	3.6	NA	NA	0.0	50	
Acetone	43	NA	NA	0.0	50	
Acrolein	<0.050	NA	NA	0.0	50	
Propionaldehyde	< 0.050	NA	NA	0.0	50	
Crotonaldehyde	<0.050	NA	NA	0.0	50	
Butyraldehyde	< 0.050	NA	NA	0.0	50	
Benzaldehyde	<0.050	NA	NA	0.0	50	
Isovaleraldehyde	<0.050	NA	NA	0.0	50	
Valeraldehyde	<0.050	NA	NA	0.0	50	
m-Tolualdehyde	<0.050	NA	NA	0.0	50	
p-Tolualdehyde	<0.050	NA	NA	0.0	50	
o-Tolualdehyde	<0.050	NA	NA	0.0	50	
Hexanal	<0.050	NA	NA	0.0	50	
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.0	50	

Sample ID: S16T029577				Collect	ed: 09/10/2016
Lab ID: 1625970007	Sa	ampling Location: CA	RTRIDGE EVALUA	ATION Receiv	ed: 09/15/2016
Method: EPA TO-11A	San		C 226-119, Silica Ge itrophenylhydrazine) Volume Not Provid		ed: 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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Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results						
Sample ID: S16T029577					Collected: 09/10/2016	
Lab ID: 1625970007	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION	Received: 09/15/2016	
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) 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: \$16T029578 Lab ID: 1625970008	Sa	ampling Location: CAF	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016		
Method: EPA TO-11A		Sampling Location: CARTRIDGE EVALUATION Received: 09/2 Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) 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		



Amended-20161004

Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results					
Sample ID: S16T029579					Collected: 09/10/2016
Lab ID: 1625970009	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	and even	Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	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: \$16T029580 Lab ID: 1625970010	Ç.	empling Location: CAF	TRINGE EVALUE	Secretary Park	llected: 09/10/2016 ceived: 09/15/2016
Method: EPA TO-11A	Sampling Location: CARTRIDGE EVALUATION Received: 09/15 Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided Analyzed: 09/22/				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/samp	le)
Formaldehyde	0.057	NA	NA	0.0	50
Acetaldehyde	1.6	NA	NA	0.0	50
Acetone	0.14	NA	NA	0.0	50
Acrolein	<0.050	NA	NA	0.0	50
Propionaldehyde	<0.050	NA	NA	0.0	50
Crotonaldehyde	<0.050	NA	NA	0.0	50
Butyraldehyde	<0.050	NA	NA	0.0	50
Benzaldehyde	0.052	NA	NA	0.0	50
Isovaleraldehyde	<0.050	NA	NA	0.0	50
Valeraldehyde	<0.050	NA	NA	0.0	50
m-Tolualdehyde	<0.050	NA	NA	0.0	50
p-Tolualdehyde	<0.050	NA	NA	0.0	50
o-Tolualdehyde	<0.050	NA	NA	0.0	50
Hexanal	<0.050	NA	NA	0.0	50

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Amended-20161004

Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Paraytroa resoures				TO DO SO WE HAVE USE	
Sample ID: \$16T029580				Collected: 09/1	0/2016
Lab ID: 1625970010	Sa	impling Location: CAI	RTRIDGE EVALUA	ATION Received: 09/1	5/2016
Method: EPA TO-11A	Sam	I (2,4- Analyzed: 09/2	2/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
2,5-Dimethylbenzaldehyde	< 0.050	NA	NA	0.050	

Sample ID: S16T029581 Lab ID: 1625970011	Sa	ampling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: EPA TO-11A	San	Analyzed: 09/22/2016			
Analyte	Result (ug/sample)	ample)			
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: \$16T029582 Lab ID: 1625970012	Sampling Location: CARTRIDGE EVALUATION						09/10/2016 09/15/2016
Method: EPA TO-11A	San	Analyzed: 09/22/2016					
Analyte	Result (ug/sample)	Result (mg/m²)				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		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

Allarytical Results					
Sample ID: S16T029582					Collected: 09/10/2016
Lab ID: 1625970012	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION	Received: 09/15/2016
Method: EPA TO-11A	San	Media: SKO Dini npling Parameter: Air \		Analyzed: 09/22/2016	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	ample)
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: 09/10/201		
Lab ID: 1625970013	Sa	impling Location: CAF	RTRIDGE EVALUA	ATION Received: 09/15/201		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/20 Dinitrophenylhydrazine) 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		



Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results					
Sample ID: S16T029584					Collected: 09/10/2016
Lab ID: 1625970014	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	- No.	Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	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: \$16T029585 Lab ID: 1625970015	S	ampling Location: CAF	RTRINGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
Method: EPA TO-11A	San	Analyzed: 09/22/2016			
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	ample)
Formaldehyde	<0.050	NA	NA	.7072	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

ration from troounts					
Sample ID: S16T029585				(1)	Collected: 09/10/2016
Lab ID: 1625970015	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	Sam	Media: SKC Dini npling Parameter: Air		Analyzed: 09/22/2016	
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sar	mple)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	3)	0.050

Sample ID: \$16T029586 Lab ID: 1625970016	Sa	ampling Location: CAF	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) 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					1: 09/10/2016
Lab ID: 1625970017	Sa	impling Location: Ca	ARTRIDGE EVALU	ATION Received	1: 09/15/2016
Method: EPA TO-11A	San		i: 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

Analytical Results					
Sample ID: S16T029587					Collected: 09/10/2016
Lab ID: 1625970017	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	ethod: EPA TO-11A Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) 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	Sa	impling Location: CAF	RTRIDGE EVALUA	ATION Received: 09/15/2016		
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2010 Dinitrophenylhydrazine) 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

Analytical Results							
Sample ID: S16T029589					Collected: 09/10/2016		
Lab ID: 1625970019	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	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: \$16T029590 Lab ID: 1625970020	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016	
Method: EPA TO-11A	Sampling Location: CARTRIDGE EVALUATION Received: 09/15/2016 Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	ample)	
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

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029590				Colle	ected: 09/10/2016
Lab ID: 1625970020	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION Rec	eived: 09/15/2016
Method: EPA TO-11A	Sam		226-119, Silica Ge rophenylhydrazine) Volume Not Provid		lyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.05	0

Sample ID: \$16T029591 Lab ID: 1625970021	Sa	ampling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016	
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sa	mple)	
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: \$16T029592 Lab ID: 1625970022	Sa	ampling Location: 6	CARTRIDGE	EVALU	ATION		09/10/2016 09/15/2016
Method: EPA TO-11A	San		SKC 226-119, Dinitrophenylh	ydrazine)		Analyzed:	09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)		(ppm)		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		NA		0.050	
Propionaldehyde	2.1	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

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Sample ID: S16T029592					Collected: 09/10/2016
Lab ID: 1625970022	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	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: \$16T029593				Collect	ed: 09/10/2016		
Lab ID: 1625970023	Sa	ampling Location: CAF	RTRIDGE EVALUA	ATION Receiv	ed: 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/201 Dinitrophenylhydrazine) 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	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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Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results							
Sample ID: S16T029594					Collected: 09/10/2016		
Lab ID: 1625970024	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) 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: \$16T029595				Collec	ted: 09/10/2016
Lab ID: 1625970025	Sa	ampling Location: CA	RTRIDGE EVALU	ATION Recei	ved: 09/15/2016
Method: EPA TO-11A	San		Analyzed: 09/22/2016		
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	Ì
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	5
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

ration from troounto					
Sample ID: S16T029595				Collected: 09/10	/2016
Lab ID: 1625970025	Sa	impling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15	/2016
Method: EPA TO-11A	Sam		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
2,5-Dimethylbenzaldehyde	< 0.050	NA	NA	0.050	

Sample ID: \$16T029596 Lab ID: 1625970026	Sa	ampling Location: CAI	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016	
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/2 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/san	nple)	
Formaldehyde	<0.050	NA	NA	C	.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	C	.050	
Crotonaldehyde	<0.050	NA	NA	0	.050	
Butyraldehyde	<0.050	NA	NA	0	.050	
Benzaldehyde	<0.050	NA	NA	C	.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	C	.050	
o-Tolualdehyde	<0.050	NA	NA	0	.050	
Hexanal	<0.050	NA	NA	0	.050	
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	C	.050	

Sample ID: S16T029597					Collected: 09/10/2016
Lab ID: 1625970027	Sa	ampling Location: C	ARTRIDGE EVA	LUATION	Received: 09/15/2016
Method: EPA TO-11A	San		KC 226-119, Silica Dinitrophenylhydrazi Lir Volume Not Pro	ne)	Analyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm) RL (ug	/sample)
Formaldehyde	< 0.050	NA	N	Ą	0.050
Acetaldehyde	2.9	NA	N	Ą	0.050
Acetone	34	NA	N.	Ą	0.050
Acrolein	<0.050	NA	N	Ą	0.050
Propionaldehyde	<0.050	NA	N	Ą	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

Allarytical Results						
Sample ID: S16T029597					Collected: 09/10/2016	
Lab ID: 1625970027	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) 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: \$16T029598	12	100 to 100 02-02		Collected: 09/10/2016			
Lab ID: 1625970028	Sa	impling Location: CAF	RTRIDGE EVALUA	ATION Received: 09/15/2016			
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) 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	2.2	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			



Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Allarytical Results					
Sample ID: S16T029599					Collected: 09/10/2016
Lab ID: 1625970029	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		Analyzed: 09/22/2016
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	<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: \$16T029600					Collected: 09/10/2016	
Lab ID: 1625970030	Sa	impling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	sample)	
Formaldehyde	< 0.050	NA	NA	Save	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: S16T029600				Colle	cted: 09/10/2016
Lab ID: 1625970030	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION Rece	ived: 09/15/2016
Method: EPA TO-11A	Sam		226-119, Silica Ge rophenylhydrazine) Volume Not Provid		yzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)	
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050	ĝ.

Sample ID: \$16T029601 Lab ID: 1625970031	Sa	ampling Location: CAI	RTRIDGE EVALU		09/10/2016 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/20 Dinitrophenylhydrazine) 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			

Sample ID: S16T029602					ed: 09/10/2016
Lab ID: 1625970032	Sa	ampling Location: CA	ARTRIDGE EVALUA	ATION Receiv	ed: 09/15/2016
Method: EPA TO-11A	San		C 226-119, Silica Ge nitrophenylhydrazine) r Volume Not Provid		ed: 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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Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Analytical Results						
Sample ID: S16T029602					Collected: 09/10/2016	
Lab ID: 1625970032	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION	Received: 09/15/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) 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: \$16T029603	982	100 Ut 100 00000		Collected: 09/10/2016
Lab ID: 1625970033	Sa	impling Location: CAF	RTRIDGE EVALUA	ATION Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Gel trophenylhydrazine) Volume Not Provide	
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

Arialytical Results							
Sample ID: S16T029604					Collected: 09/10/2016		
Lab ID: 1625970034	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016		
Method: EPA TO-11A	San	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/201 Dinitrophenylhydrazine) 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: \$16T029605				Collected: 09/10/2016
Lab ID: 1625970035	Sa	impling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: EPA TO-11A	San	l (2,4- Analyzed: 09/22/2016		
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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Amended-20161004

Workorder: 34-1625970

Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

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Sample ID: S16T029605				Collecte	d: 09/10/2016
Lab ID: 1625970035	Sa	impling Location: CAI	RTRIDGE EVALU	ATION Receive	d: 09/15/2016
Method: EPA TO-11A	Sam	Media: SKC Dini npling Parameter: Air		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: 09/10/20
Lab ID: 1625970036	Sa	ampling Location: CAR	RTRIDGE EVALU	ATION Received: 09/15/20
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	erinte les sont est est est en sum est
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 Lab ID: 1625970037	Sa	ampling Location:	CARTRIDGE	EVALU	ATION		09/10/2016 09/15/2016
Method: EPA TO-11A	San		SKC 226-119, Dinitrophenylh Air Volume N	ydrazine)	antista.	Analyzed:	09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³		t (ppm)		(sample)	
Formaldehyde	<0.050	NA NA	4	NA		0.050	
Acetaldehyde	<0.050	N.A	1	NA		0.050	
Acetone	<0.050	N.A	4	NA		0.050	
Acrolein	<0.050	NA NA	4	NA		0.050	
Propionaldehyde	<0.050	NA.	4	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

Allaytical Results						
Sample ID: S16T029607					Collected: 09/10/2016	
Lab ID: 1625970037	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016	
Method: EPA TO-11A	Media: SKC 226-119, Silica Gel (2,4- Analyzed: 09/22/2016 Dinitrophenylhydrazine) Sampling Parameter: Air Volume Not Provided					
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/s	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: \$16T029608 Lab ID: 1625970038	Sa	ampling Location: CAF	RTRIDGE EVALUA	Collected: 09/10/2010 ATION Received: 09/15/2010
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
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



Amended-20161004

Workorder: 34-1625970
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Arialytical Results					
Sample ID: S16T029609					Collected: 09/10/2016
Lab ID: 1625970039	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid		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
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: \$16T029610				Collected: 09/10/2016
Lab ID: 1625970040	Sa	ampling Location: CAI	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: EPA TO-11A	San		226-119, Silica Ge trophenylhydrazine) Volume Not Provid	
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

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Sample ID: \$16T029610 Lab ID: 1625970040	Sa	mpling Location: C	ARTRIDGE EVALU		ollected: 09/10/2016 eceived: 09/15/2016
Method: EPA TO-11A	San	Di	KC 226-119, Silica Ge initrophenylhydrazine) ir Volume Not Provid		nalyzed: 09/22/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sam	ple)
2,5-Dimethylbenzaldehyde	< 0.050	NA	NA	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, 518409): All of the analytes recoveries were within 20% of the target. Some analytes are outside of histroical 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	
FDA TO 44A	/S/ Emilie Pratt	/S/ Christopher Winter	
EPA TO-11A	09/28/2016 14:07	09/29/2016 15:48	

Laboratory Contact Information

ALS Environmental Phone: (801) 266-7700 960 W Levoy Drive Salt Lake City, Utah 84123 Email: alslt.lab@ALSGlobal.com Web: www.alsslc.com



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/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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.com

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 Envrionmental 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

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Quality Control Sample Batch Report

Analysis Information

Workorder: 1625970

Limits: Historical/Performance Preparation: NA Analysis: EPA TO-11A

 Basis: ALS Laboratory Group
 Batch: NA
 Batch: ILC/12651 (HBN: 176736)

 Prepared By: NA
 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

Page 1 of 3

Analyte Result MDL RL Formaldehyde NE NA 0.0500 Acetaldehyde 0.172 NA 0.0500 Acetone 0.196 NA 0.0500 NA 0.0500 Acrolein ND Propionaldehyde ND NA 0.0500 ND Crotonaldehyde NA 0.0500 ND NA 0.0500 Butyraldehyde Benzaldehyde ND NA 0.0500 Isovaleraldehyde ND NA 0.0500 Valeraldehyde ND NA 0.0500 ND NA 0.0500 m-Tolualdehyde p-Tolualdehyde ND NA 0.0500 NA 0.0500 o-Tolualdehyde ND NA 0.0500 Hexanal ND 2,5-Dimethylbenzaldehyde ND NA 0.0500



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625970

Limits: Historical/Performance Preparation: NA Analysis: EPA TO-11A Basis: ALS Laboratory Group Batch: NA Batch: ILC/12651 (HBN: 176736)

Prepared By: NA Analyzed By: Emilie Pratt

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 518405 LCSD: 518406 Analyzed: 09/22/2016 00:00 Analyzed: 09/22/2016 00:00 Dilution: 1

Dilution: 1

Units: ug/sample Units: ug/sample Analyte %Rec QC Limits Result % Rec RPD QC Limits Result Target 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. 0.0 20.0 20.0 Acetone 3.30 3.00 110 69.2 119.9 2.74 91.4 18.6 0.0 83.5 120.2 2.71 90.3 0.0 20.0 3.11 3.00 104 13.8 Acrolein 3.00 92.5 3.18 106 117.2 2.78 13.7 0.0 20.0 Propionaldehyde 92.2 3.20 3.00 107 114.8 2.79 93.0 13.7 0.0 20.0 Crotonaldehyde 93.1 12.3 Butyraldehyde 3.12 3.00 104 86.6 120.8 2.76 91.9 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 3.00 114 121.6 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 3.15 3.00 122.2 2.68 89.2 20.0 p-Tolualdehyde 105 83.5 16.2 0.0 o-Tolualdehyde 3.19 3.00 106 91.6 111.4 2.79 92.8 13.4 0.0 20.0 3.14 127.6 Hexanal 3.00 105 85.4 2.92 97.3 7.33 0.0 20.0 2.85 2,5-Dimethylbenzaldehyde 3.00 95.0 99.6 118.7 2.62 87.2 8.56 0.0 20.0

LCSD: 518409

LCS: 518408 Analyzed: 09/22/2016 00:00

Analyzed: 09/22/2016 00:00 Dilution: 1 Dilution: 1 Units: un/sample

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Analyte	Result	Target	%Rec	QC Li	mits	Result	% Rec	RPD	QCLI	mits
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 Preparation: NA Analysis: EPA TO-11A

Basis: ALS Laboratory Group Batch: NA Batch: ILC/12651 (HBN: 176736)
Prepared By: NA Analyzed By: Emilie Pratt

Comments

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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	/S/ Christopher Winter	
09/28/2016 14:07	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

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•					¥15	IN OF COSTOD I/SAMITEE ANA	LI SIS NEGOESI	Page 1	of 4
Collector		1			Contact/Requesto	51	Telephone No ₃₇₃ -6861	MSIN FAX 3	FAX 372-1878
SAF No.	,	ì			Sample Origin	MILION	Purchase Order/Charge Code		
Project Title	MATON	İ			Logbook/ Work Package No.	ackage No.	loe Chest No. 604 <- 0.33	SS Temp. ON TCE	100
Shipped To (Lab)	(q				Method of Shipment	ent	SIII of Lading/Air Bill No. 1772	1115	27704728
Protocol 8/8		İ			Data Turnaround	4	Parts and Return No.	41310	
Sample No.	Lab ID	·	Date	Time	No_Type Container		Sample Analysis		Preservative
-	\$167029571	5	91/01/60		SILICA GEL	Aldehyde 16-07837-8-IN-A ; .	У		25C or low
2	S16T029572	8	91/01/60		SILICA GEL	Aldehyde 16-07837-8-IN-B ;	*		25c or 10w
u	S16T029573	\$	VA 09/10/16		SILICA GEL	Aldehyde 16-07837-8-IN-C;			25C or 10W
ק	S16T029574	5	VA 09/10/16		SILICA GEL	Aldehyde 16-07837-8-IN-D .		7	25C or low
u	\$162029575	S	91/01/60		SILICA GEL	Aldehyde 16-07837-8-IN-E, .	•		25C or low
٥	\$162029576	5	09/10/16		SILICA GEL	Aldehyde 16-07837-8-IN-F;			25C or 10W
-	S16T029577	8	91/01/60		SILICA GEL	Aldehyde 16-07837-8-IN-G -		8	25C or 10w
60	S16T029578	8	VA 09/10/16	i E	SILICA SEL	Aldehyde 16-07837-8-IN-H ; '	ç		25C or 10W
9	\$16T029579	\$	91/01/60		SILICA GEL	Aldehyde 16-07837-8-EFF-A, '			25c or low
2	S16T029580	S	09/10/16		SILICA GEL	Aldehyde 16-07837-8-EFF-B ;	ø		25c or low
POSSIBLE SA	MPLE HAZAROS/F	ZEMAI	RKS (List all k	mown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS () Yes EPA TO-11A	Yes No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg When the Second Second Carl Royald Carl Washington and Gregory S. Morederl.gov and Gregory S. Morederl.gov and Ralease 9 Ralease 9 Reference Contract # 55502	SOW for	Hold Time	
Relinquished By	olbe Al	17	Sign	41.6	191	WRPS Chulu Color 9.1	6 0900	Matrix = Soil DL	= Drum Liquids
Refinquished By Gradisher WRPS Relinquished By	Sradisher W	(A) 8	relació (supre	9	A HILE 1400 Date/Time Re	Received By FEDEX Received By Annual Manual		= Solid = Sludge = Water	
Relinquished By	- MICH	3			Date/Time Re	INTIMETY COMMAS (MININ BAMY) Received By	Date/Time DS	= Air · = Drum Solids	
FINAL SAMPLE DISPOSITION	Disposal N	(e.g.,	Return to cust	tomer, per	lethod (e.g., Return to customer, per lab procedure, used in process)	S A	#	9/11/11/P	Птие 14:20
Capper to attraction of						PIN T 6		1116111	*

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Page 2	9/0					3	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	IALYSIS REQUES	20162739	2739
Contract/Requestor Contract/Requestor Contract/Requestor Contract/Requestor Contract/Requestor Contract/Requestor Contract/Requestor Contract/Reduestor Contract/Reduc										
Sample Origin	Collector					Contact/Reque	estor	Telephone No ₃₇₃ -6	MSI	72-1878
	SAF No.				1	Sample Origin	ALUACION	Purchase Order/Char 202062/c320		
	Project Title	LUATION				Logbook/ Work	k Package No.	Ice Chest No.	Temp.	じと
Time No.Type Container Sample Analysis Sample Analysis	Shipped To (La	ab)				Method of Ship	pment	Bill of Lading/Air Bill	ייי ירדר	473
Time No.Type Container Sample Analysis	Protocol 4/A					Data Turnarou	pur	Parts and Return No.	21310	
SILICA GEL Aldehyde 16-07837-8-EFF-D 1	Sample No.	Lab ID	٠	Date	Time	No./Type Contains		ample Analysis		Preservative
SILICA GEL Aldehyde 16-07837-8-EFF-F	11	S16T029581	N.	91/01/60		SILICA GEL	Aldehyde 16-07837-8-EFF-C 1 ,	3		25c or low
SILICA GEL Aldehyde 16-07837-8-EFF-E; SILICA GEL Aldehyd	7.1	S16T029582	5	09/10/16	- 5	SILICA GEL	Aldehyde 16-07837-8-BFF-D 4 .	,		25C or low
SILICA GEL Aldehyde 16-07837-8-EFF-6 1. SILICA GEL Aldehyde 16-07837-8-EFF-6 1. SILICA GEL Aldehyde 16-07837-8-EFF-8	13	S16T029583	V.	91/01/60		SILICA GEL	Aldehyde 16-07837-8-2FF-E \ '	si .		25c or low
SILICA GEL Aldehyde 16-07837-8-EFF-81. SILICA GEL Aldehyde 16-07837-8-EFF-81. SILICA GEL Aldehyde 16-07837-8-EFF-81. SILICA GEL Aldehyde 16-07837-8-EASE-EFF. SILICA GEL Aldehyde 16-07837-8-EASE-EFF. SILICA GEL Aldehyde 16-07837-8-EASE-EFF. SILICA GEL Aldehyde 16-07837-8-EASE-EFF. SILICA GEL Aldehyde 16-07837-8-EARET. Hold Time Received By Received By Received By Print Aldehyde 16-07837-8-EARET. A RECEIved By A RECEIVED BY BATTIME ALMAN SIGN WAS CONTRACT. Date/Time Received By A RECEIVED BY BATTIME BY A BATTIME BY BY BY BY BY BY BY BY BY BY BY BY BY	h1	S16T029584	Z,	91/01/60		SILICA GEL	Aldehyde 16-07837-8-EFF-F			25C or low
SILICA GEL Aldehyde 16-07837-8-EFF-H 1, 1 SILICA GEL Aldehyde 16-07837-8-EASE-EFF 1, 2 SILICA GEL Aldehyde 16-07837-8-EASE-EFF 1, 3 SILICA GEL Aldehyde 16-07837-8-EARMEN 1, 3 SILICA GEL Aldehyde 16-07837-8-EARMEN 1, 3 SILICA GEL Aldehyde 16-07837-8-EARMEN 1, 3 SILICA GEL Aldehyde 16-07837-8-EARMEN 1, 3 SECONDAIN STRUCTIONS	15	\$161029585	V.	09/10/16		SILICA GEL	Aldehyde 16-07837-8-EFF-G : .	,		25C or low
SILICA GEL Aldehyde 16-07837-8-BASE-IN ,	91	\$162029586	V.	08/10/16		SILICA GEL	Aldehyde 16-07837-8-EFF-H 1	-		25c or low
SILICA GEL Aldehyde 16-07837-8-BABKE1; SILICA GEL Aldehyde 16-07837-8-BABKE1; SILICA GEL Aldehyde 16-07837-8-BABKE1; STATICA GEL Aldehyde 16-07837-8-BABKE1; STATICA GEL Aldehyde 16-07837-8-BABKE2; STATICA GEL Aldehyde 16-07837-8-BABKE2; STATICA GEL Aldehyde 16-07837-8-BABKE2; STATICA GEL ALGEBRA GALL GOV ALL SON SON SON SON SON SON SON SON SON SON	۲)	\$167029587	VA	91/01/60		SILICA GEL	Aldehyde 16-07837-8-EASE-EFF + *	,		25C or 10W
SILICA GEL Aldehyde 16-07837-6-BLANKI; SILICA GEL Aldehyde 16-07837-6-BLANKI; SILICA GEL Aldehyde 16-07837-6-BLANKI; SECRET AND SPECIAL INSTRUCTIONS SEA RESULTS to Call Stowald IV and Greg Call Bowaldel, gov and Secret Cooperate # 55502 Date/Time Received By PEDEX Date/Time Received By Call Boy Call Boy Call Boy Call Boy Call Boy Call Boy Call Boy Call Boy Call Boy Call Boy Call Call Call Call Call Call Call Cal	8)	S16T029588	VA	09/10/16		SILICA GEL	Aldehyde 16-07837-8-BASE-IN , .	•		25C or 10W
SILICA GEL Aldehyde 16-07837-6-BIANEZ ; Aldehyde 16-07837-6-BIANEZ ; Hold Time SPECIAL INSTRUCTIONS Special Search S	14	S16T029589	VA	09/10/16		SILICA GEL	Aldehyde 16-07837-8-BLANKI;	7		25c or low
Hold Time Seed Results to Carl Sowald IV and Greg Carl W Scores Sow Sow Seed Results Reserved By Date/Time Received By Date/Time	20	\$167029590	VA	91/01/60		SILICA GEL	Aldehyde 16-07837-8-BLANK2 ; .	×		25c or low
Pate/Time Received By Gradisher Sign Pate/Time Sign Pate/Time Seadinent Pate/Time Received By FEDEX Pate/Time Pate	POSSIBLE SA EPA TO-11A	MPLE HAZARDS/R	KEMAJ	RKS (List all i	coown was	MSDS O		Howald IV and Greg and v see SOW for email 55502	Hold Time	
H W H Date/Time Received By FEDEX PEDEX Solid W SO = Solid W SO = Solid W Solid W Solid W Solid W Solid W Solid W Solid W Solid W Solid W Water V Water V W Water Water W Water Wa	Refinquished B	Nollie M	7	Sign	9.14	SQ QQ	Received By Print Sign Sign WRPS	F///, Dai	Ma S = Soil	= Drum Clause
Date/Time Received By Date/Time Received By Disposed Relinquished B	iradisher	5	Jahraha	P 2	Date/Time	2	Ö	SE = Sediment T SO = Solid WI	= Tissue = Wipe = Liquid	
Date/Time Received By Date/Time Date/Time Date/Time Disposed By Date/Time Disposed By Date/Time Disposed By Date/Time Disposed By Date/Time Disposed By Date/Time Date/Time Disposed By Date/Time Date/Date/Date/Date/Date/Date/Date/Date/	Relinquished E	MAN 6 VE				Date/Time	Meyoddy Edwyds Moull Stur	Olysliu/915	W = Water V = OII VA	= Vegetation = Vapor
Disposal Method (e.g., Return to customer, per lab procedure (used in process)	Relinquished B	λε		100		Date/Time F	Received By	. Date/Tim	DS = Drum Solids	= Other
	DISPOSITION	Disposal Method (e.g.,	Return to cust	tomer, per	iab procedure (used	in process) Lipposed By Lipposed By	4	9/16/11/ Pate/Time	:20

1625970 - Page 31 of 33

Collector JONES SAF No.					5	CHOCK OF THE PINAL TO SO TO THE PINAL TO THE	YSIS KEOLES	000000000000000000000000000000000000000	
Collector ONES SAF No.								Page 3	of 4
SAF No.					Contact/Requestor		Telephone No.373-6861	MSIN FAX 3	FAX 372-1878
N/A					Sample Origin CARTRIDGE EVALUATION	MILLON	Purchase Order/Charge Code		
Project Title	LUBLION				Logbook/ Work Package No.	ackage No.	Ice Chest No. 1. 1. 0.022	Temp. Car	15.4
Shipped To (Lab)	(qe				Method of Shipment	ent	Bill of Lading/Air Bill No.	11	4738
Protocol					Data Turnaround		Parts and Return No.	41310	
Sample No.	. Lab ID	•	Date	Time	No./Type Container	Sampl	Sample Analysis		Preservative
17	S16T029591	A.A.	09/10/18	2000	SILICA GEL	Aldehyde 16-08068-8-IN-A			25C or low
27	S16T029592	V.	91/01/60		SILICA GEL	Aldehyde 16-08068-8-IN-B , ,			25C or low
23	\$167029593	5	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-C/			25C or low
77	\$162029594	EN.	91/01/60		SILICA GEL	Aldehyde 16-08068-8-IN-D /			25C or low
57	S16T029595	\$	91/01/60		SILICA GEL	Aldehyde 16-08068-8-IN-E.			25C or 10W
37	S16T029596	Z.	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-F			25C or low
1.1	\$167029597	A.	91/01/60		SILICA GEL	Aldehyde 16-08068-8-IN-G ,			25C or low
87	8167029598	V.A	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-IN-H * ,			25C or low
29	8151029599	K	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-A /			25C or low
30	8157029600	V.	91/01/60		SILICA GEL	Aldahyda 16-08068-8-EFF-B / .	*		25C or low
POSSIBLE SA	AMPLE HAZARDS/F	REMA	KKS (List all k	nown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Noord Rowaldell gov and Gregory & Mooreeringov see SOW for email Release Contract # 55502	ald IV and Greg ee SOW for email	ноід Тіте	
Shu wan Liber A	By Print LUGICAL A	1. 4	Sign July			Received By Stradisher, Sign Sign WRPS (1.4)	Oate/Time	Matrix*	= Dram Liquids
Relinquished By JA Gra WRPS	Relinquished By WRPS () () () Coop () Jun	10,0	- Jakoh	167	R	2	Time	= Sedment T = Solid WI	
Relinquished	By CEUE	4				Murdel Edunds Shoul Stud	MISIW 9	= Water V = Oil VA	= Vegetation = Vapor
Relinquished By	ey.				Date/Time Red	eived By	Ime	A = Arr X	= Other
FINAL SAMPLE DISPOSITION		(e.g., l	Return to custo	omer, per	Disposal Method (e.g., Return to customer, per lab procedure, beed in process)	Disposed By		9/II/II	OC:h/
						177		01/01/01	1

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Collector Joses SAE No				CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	20162739	
Collector							Page 4 of	4
SACAIN				Contact/Requestor		Telephone No 373-6861	MSIN FAX 372-1878	78
K/A		5,59		Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code		
Project Title				Logbook/ Work Package No.		loe Chest No. L. A C. OZ	22 Temp. 013 3	75
Shipped To (Lab)				Method of Shipment	e e	Bill of Lading/Air Bill No.		728
Protocol N/B				Data Turnaround		Parts and Return No.	41310	
Sample No. Lab ID	Ė	Date	Time	No./Type Container		Sample Analysis	1	Preservative
5(\$167029601	5	09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-C)	-	250	25c or low
32 8161029602		VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-D !	,	250	25C or low
33 8161029603	8	VA 09/10/16		SILICA GEL	Aldehyde 16-08069-8-EFF-E;		250	25C or low
34 8161029604	. VA	91/01/60		SILICA GEL	Aldehyde 16-08068-8-EFF-F ,		250	25C or low
35 8161029605	R	01/01/60 AV		SILICA GEL	Aldehyde 16-08068-8-8FF-6,	9	. 250	25C or low
36 \$167029606	V.	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-EFF-H;		250	25C or low
37 8162029607	R.	91/01/60		SILICA GEL	Aldehyde 16-08069-8-BASE-EFF /		250	25C or low
38 8167029608	Z,	VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-BASE-IN	~	25C	25C or low
39 8167029609	5	VA 09/10/16		SILICA GEL	Aldehyde 16-08069-8-BLANK-EFF,	,	250	25C or low
46 \$167029610		VA 09/10/16		SILICA GEL	Aldehyde 16-08068-8-BIANK-IN	•	. 250	25C or low
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes 22 TO-113.	SIREMA	RKS (List all k	nown was	eres) MSDS () Ye	S No SPECIAL INSTRUCTIONS Send Results to Carl Bowald IV and Greg Moore Carl W Bowalder, gov and Gregory S. Moore@ell.gov see SOW for email Relates 9 Reference Contract # 55502 NICOSE 2016 MOOR	ld IV and Greg e SOW for email 2	Hold Time	
Relinquished By Print Savon Live Dec / M.	3	Sign		9-IH-IG OSO	Received By Print Sign WA Gradisher WA Gradisher WAS Colored By Child Colored By Child Colored By Child Colored By Child Colored By Child Colored By Child Child Colored By Child Ch	2 OROCO Date/Time	Matrix* = Soil DL = Sediment T	= Drum Liquids = Tissue
WRPS () LOS	3	(Sea) Care	4	6 1400 Re	Received by	So State St. St. Oliceline W	= Solid WI = Sludge L = Water V	= Wipe = Liquid = Vegetation
Relinquished By	200			Date/Time Re	Received By Autiful Museum Anting	Date/Time A	= Air X = Drum Solids	ė
FINAL SAMPLE DISPOSITION	, e.g.,	Return to cust	omer, per	Disposal Method (e.g., Return to customer, per lab procedure, used in process	process) Disposed By		9/10/11/10 Hz	2

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C.3.9 1, 3-Butadiene

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

Richland, WA 99352



ANALYTICAL REPORT

Report Date: September 21, 2016

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

Workorder: 34-1625972

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

1.3-Butadiene	<0.0010	NA	NA.	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC	226-37 Sorbent To lume Not Provid		016
Sample ID: S16T029411 Lab ID: 1625972001	Sa	mpling Location: CAF	RTRIDGE EVALU	Collected: 09/10/2 ATION Received: 09/15/2	

Sample ID: S16T029412 Lab ID: 1625972002	Sa	mpling Location: CAF	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent To	[(
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: \$16T029413 Lab ID: 1625972003	Sa	impling Location: CAF	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T029414 Lab ID: 1625972004	Sa	impling Location: CAI	RTRIDGE EVALU	ATION		09/10/2016 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		Analyzed:	09/21/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sa	ample)	
1,3-Butadiene	<0.0010	NA	NA		0.0010	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Ltah, 84123 LISA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

Environmental 🤙

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Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analy	rtical.	Resu	lts

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fing continue	recount (mg/m/	resource (blann)	tem finish a combial	
Result (mg/sample)	Result (ma/m³)	Result (ppm)	RL (mg/sample)	
San				red: 09/21/2016
Sa	mpling Location: CAF	RTRIDGE EVALU		ed: 09/15/2016
	San	Media: SKC Sampling Parameter: Air \ Result	Media: SKC 226-37 Sorbent To Sampling Parameter: Air Volume Not Provid Result	Media: SKC 226-37 Sorbent Tube Analyz Sampling Parameter: Air Volume Not Provided Result

1.3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	San	Media: SKC pling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		alyzed: 09/21/2016
Sample ID: S16T029416 Lab ID: 1625972006	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKO ppling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		zed: 09/21/2016
Sample ID: S16T029417 Lab ID: 1625972007	Sa	mpling Location: CAF	RTRIDGE EVALU	1,100,000,000	ted: 09/10/2016 red: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.001	n
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu olume Not Provid		alyzed: 09/21/2016
Sample ID: \$16T029418 Lab ID: 1625972008	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

< 0.0010	NA	NA	0	0010
Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/san	nple)
Sam				Analyzed: 09/21/2016
Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016
	San Result (mg/sample)	Media: SKC Sampling Parameter: Air \ Result (mg/sample) Result (mg/m³)	Media: SKC 226-37 Sorbent Tu Sampling Parameter: Air Volume Not Provid Result (mg/sample) Result (mg/m²) Result (ppm)	Sampling Location: CARTRIDGE EVALUATION Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided Result (mg/sample) Result (mg/m²) Result (ppm) RL (mg/sample)



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analy	rtical	Resul	ts

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1,3-Butadiene	< 0.0010	NA	NA	0.0010	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San	Media: SKC pling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029420 Lab ID: 1625972010	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.00	10	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)	
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 09/21/2016	
Sample ID: S16T029421 Lab ID: 1625972011	Sa	mpling Location: CAF	RTRIDGE EVALU		ollected: 09/10/2016 eceived: 09/15/2016	

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		lyzed: 09/21/2016
Sample ID: S16T029422 Lab ID: 1625972012	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.001	0	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)	
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 09/21/2016	
Sample ID: \$16T029423 Lab ID: 1625972013	Sa	mpling Location: CAF	RTRIDGE EVALU		lected: 09/10/2016 eived: 09/15/2016	

1.3-Butadiene	< 0.0010	NA	NA	1/3	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	ample)	
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid		Analyzed: 09	/21/2016
Lab ID: 1625972014	Sa	mpling Location: CAF	RTRIDGE EVALU	ATION	Received: 09	
Sample ID: S16T029424					Collected: 09	9/10/2016



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analy	vtical	Resu	lts

1,3-Butadiene	< 0.0010	NA	NA	0.0010	01
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	8
Method: NIOSH 1024	Sam	Media: SKC pling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		yzed: 09/21/2016
Sample ID: S16T029425 Lab ID: 1625972015	Sa	mpling Location: CAF	RTRIDGE EVALU		cted: 09/10/2016 ived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	10	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sampl	le)	
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 09/21/2016	
Sample ID: S16T029426 Lab ID: 1625972016	Sa	mpling Location: CAF	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016	

1.3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		lyzed: 09/21/2016
Sample ID: S16T029427 Lab ID: 1625972017	Sa	mpling Location: CAI	RTRIDGE EVALU	1,-,-,-	ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	10	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)	
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 09/21/2016	
Sample ID: \$16T029428 Lab ID: 1625972018	Sa	mpling Location: CAF	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016	

1.3-Butadiene	< 0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/san	nple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029429 Lab ID: 1625972019	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analy	∕tical	Resul	ts

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1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		zed: 09/21/2016
Sample ID: \$16T029430 Lab ID: 1625972020	Sa	mpling Location: CAF	RTRIDGE EVALU		ted: 09/10/2016 /ed: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.001	0	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sample	e)	
Method: NIOSH 1024	Media: SKC 226-37 Sorbent Tube Sampling Parameter: Air Volume Not Provided				Analyzed: 09/21/2016	
Sample ID: S16T029431 Lab ID: 1625972021	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016	

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Sam	Media: SKO ppling Parameter: Air V	226-37 Sorbent Tu Volume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029432 Lab ID: 1625972022	Sa	mpling Location: CAF	RTRIDGE EVALU	1,30,230	ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.0010	1
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San		Analyzed: 09/21/2016		
Sample ID: \$16T029433 Lab ID: 1625972023	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1,3-Butadiene	<0.0010	NA	NA	(0.0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sa	mple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid	257,000	Analyzed: 09/21/2016
Sample ID: S16T029434 Lab ID: 1625972024	Sa	mpling Location: CAI	RTRIDGE EVALU		Collected: 09/10/201 Received: 09/15/201



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

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An	alvt	ical F	(est	ilts

1,3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		alyzed: 09/21/2016
Sample ID: \$16T029435 Lab ID: 1625972025	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1,3-Butadiene	<0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sam	ple)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029436 Lab ID: 1625972026	Sa	mpling Location: CAF	RTRIDGE EVALU		collected: 09/10/2016 eceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	E:
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	L
Method: NIOSH 1024	San	Media: SKO npling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		yzed: 09/21/2016
Sample ID: \$16T029437 Lab ID: 1625972027	Sa	mpling Location: CAF	RTRIDGE EVALU	1,30,000	ected: 09/10/2016 eived: 09/15/2016

Sample ID: \$16T029438 Lab ID: 1625972028	Sa	mpling Location: CAF	RTRIDGE EVALU	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent Tu Volume Not Provid	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	<0.0010	NA	NA	1 0	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	ample)	
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent To Volume Not Provid	257,000	Analyzed:	09/21/2016
Lab ID: 1625972029	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION	Received:	
Sample ID: S16T029439					Collected:	09/10/201



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

		_	
Anal	vtical	Resul	ts

1.3-Butadiene	<0.0010	NA	NA	0.0010)
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029440 Lab ID: 1625972030	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sam	ple)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029441 Lab ID: 1625972031	Sa	mpling Location: CAF	RTRIDGE EVALU		collected: 09/10/2016 eceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid		zed: 09/21/2016
Sample ID: S16T029442 Lab ID: 1625972032	Sa	mpling Location: CAI	RTRIDGE EVALU	1,000	ted: 09/10/2016 ved: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.0010	1
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San		lyzed: 09/21/2016		
Sample ID: \$16T029443 Lab ID: 1625972033	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam	ple)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029444 Lab ID: 1625972034	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



Workorder: 34-1625972
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analy	rtical	Resu	Its
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1.3-Butadiene	<0.0010	NA	NA	0.001	:#
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKO pling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		alyzed: 09/21/2016
Sample ID: \$16T029445 Lab ID: 1625972035	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	le)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		alyzed: 09/21/2016
Sample ID: S16T029446 Lab ID: 1625972036	Sa	mpling Location: CAF	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	0,1
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	L
Method: NIOSH 1024	San	Media: SKO ppling Parameter: Air V	226-37 Sorbent Tu Volume Not Provid		yzed: 09/21/2016
Sample ID: \$16T029447 Lab ID: 1625972037	Sa	mpling Location: CAF	RTRIDGE EVALU	1,30,200	cted: 09/10/2016 lived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air \	226-37 Sorbent Tu olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029448 Lab ID: 1625972038	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.	0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/san	nple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029449 Lab ID: 1625972039	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



Workorder: 34-1625972

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Analyte 1.3-Butadiene	(mg/sample) <0.0010	Result (mg/m³) NA	Result (ppm) NA	RL (mg/samp	-
	Result				
Method: NIOSH 1024	San	Media: SKC pling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		nalyzed: 09/21/2016
Lab ID: 1625972040	Sa	mpling Location: CAF			eceived: 09/15/2016
Sample ID: \$16T029450				Co	ollected: 09/10/2016

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review	
NIOSH 1024	/S/ Fred Rejali	/S/ John M. Reynolds	
	09/21/2016 15:53	09/21/2016 16:20	

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



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/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	lowa	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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.com

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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.

< 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 Envrionmental 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

IHREP-V12.3

^{**} No result could be reported, see sample comments for details.



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625972

Analysis: NIOSH 1024 Limits: Historical/Performance Preparation: NA

Batch: IFID/7770 (HBN: 176979) Basis: ALS Laboratory Group Batch: NA

Prepared By: NA Analyzed By: Fred Rejali

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 ND 1,3-Butadiene NA 0.00100

MB: 519107

Analyzed: 09/21/2016 00:00

Units: mg/sample

Result RL Analyte 1,3-Butadiene ND 0.00100

MB: 519110

Analyzed: 09/21/2016 00:00

Units: mg/sample

Analyte MDL Result RL 1,3-Butadiene ND 0.00100

MB: 519113

Analyzed: 09/21/2016 00:00

Units: mg/sample

Analyte Result MDL RL 1,3-Butadiene 0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519102 LCSD: 519103 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample % Rec %Rec QC Limits Result RPD QC Limits Analyte Result Target 1,3-Butadiene 0.0259 0.0274 78.0 0.0 20.0 94.7 117.6 0.0261 95.4 0.769

LCS: 519105

LCSD: 519106 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1

Dilution: 1

Units: mg/sample Units: mg/sample Result %Rec QC Limits Result % Rec RPD QC Limits Analyte Target 20.0 1,3-Butadiene 0.0262 0.0274 95.8 78.0 117.6 0.0254 0.0

Page 1 of 2 Wednesday, September 21, 2016 1625972 - Page 11 of 16 QCS V4.1



Quality Control Sample **Batch Report**

Analysis Information

Workorder: 1625972

Limits: Historical/Performance Preparation: NA Analysis: NIOSH 1024

Basis: ALS Laboratory Group Batch: NA Batch: IFID/7770 (HBN: 176979) Prepared By: NA Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519108 LCSD: 519109 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00

Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Analyte %Rec QC Limits Result % Rec RPD QC Limits Result Target

1,3-Butadiene 0.0274 0.0274 100 78.0 117.6 0.0272 99.4 0.733 0.0 20.0

LCS: 519111 LCSD: 519112 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00

Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Analyte %Rec QC Limits Result QC Limits Result Target % Rec RPD

1.3-Butadiene 0.0285 0.0274 104 78.0 117.6 0.0298 4.46 0.0 20.0 LCS: 519114 LCSD: 519115

Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Result % Rec %Rec QC Limits RPD

Analyte Result Target 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	/S/ John M. Reynolds	
09/21/2016 15:58	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

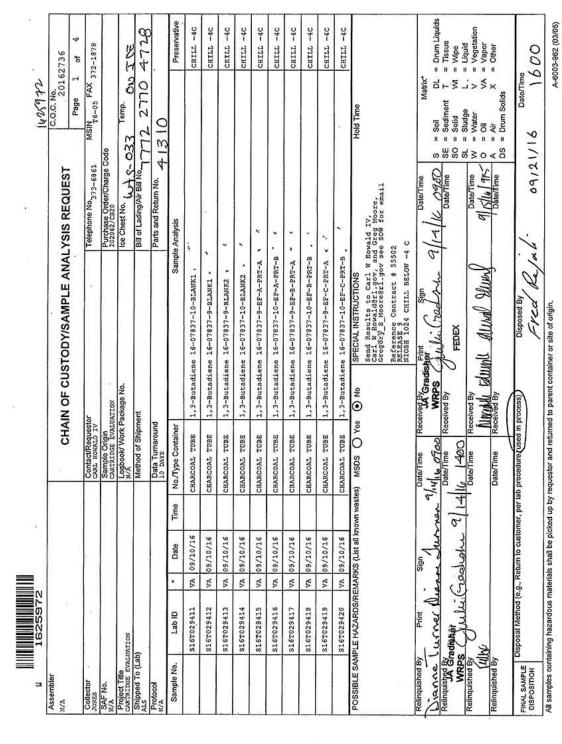
. Result is above the calibration range

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



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					5	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	ALYSIS RECOLES	95/20102	
								Page	2 of 4
Collector					Contact/Requestor	uestor) IV	Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	in	Purchase Order/Charge Code	e	
Project Title	LUATION				Logbook/ Wor.	Logbook/ Work Package No.	loe Chest No.	Temp.	12
Shipped To (Lab)	(qe				Method of Shipment	hipment	Bill of Lading/Air Bill No. 772	27	
Protocol N/A					Data Turnaround	puno	Parts and Return No. 41315	310	
Sample No.	Lab ID		Date	Time	No./Type Container		Sample Analysis		Preservative
	S16T029421	NA.	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-D-PRT-A	0 1		CHILL -4C
	S16T029422	WA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-D-PRT-B			CHILL -4C
	S16T029423	VA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-E-PRT-A	,		CHILL -4C
	S16T029424	VA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-E-PRI-B	, .		CHILL -4C
	S16T029425	8	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-ZF-F-PRT-A	٥,		CBILL -4C
	S16T029426	A.V	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-F-PRT-B			CHILL -4C
	S16T029427	V.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EF-G-PRT-A			CHILL -4C
	S16T029428	Z.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-G-PRT-B	٠,٠		CHILL -4C
	S16T029429	VA	09/10/16		CHARCOAL TOBE	1,3-Butadiene 16-07837-9-EF-H-PRT-A	7.1		CHILL -4C
G	S16T029430	VA	91/01/60	i a	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EF-H-PRT-B	2 . 8		CHILL -4C
POSSIBLE SA	MPLE HAZARDS/R	EMAF	KKS (List all k	nown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	Yes No SPECIAL INSTRUCTIONS Send Results to Carl W Howald IV, Carl ** Rehaldfell, gov, and Greg Woore, Gregofty_S Wooredell.gov see SOM for email Reference Contract # 55502 REBERSE RESERVED # 4 CHILL BELOW + 4 C	Howald IV, ind Greg Moore, see SoW for email 502	Hold Time	
Relinquished B	Print Print	15	Sign	0		disper	9/14/16 Agrees	Matrix'	opinoi Land
Relinquished B	Relinquished By Aradisher 11 16 15 15 15 15 15 15	i Godi	4	\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	10			= Sediment	
Refinquished B	W SAICK					Perceived By Wingle Hund Stilled	MFAILURS O	0 8	
Relinquished By					Date/Time R	Received By	r bate/Time A	S = Drum Solids	ii Caec
FINAL SAMPLE DISPOSITION		s.g., R	tetum to cust	omer, per	Disposal Method (e.g., Return to customer, per lab procedure (used in process)	d in process) Disposed By	1,40 .77	Date/Time	1600
		1							

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					CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	LYSIS REQUEST	Page 3 of	of 4
Collector				1	Contact/Requestor	х	Telephone No 373-6861	¥	372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	NOITE	Purchase Order/Charge Code 202062/CB20		
Project Title	LUALION				Logbook/ Work Package No.	ackage No.	loe Chest No.	7 Temp.	15
Shipped To (Lab)	ab)			-	Method of Shipment	ent	Bill of Lading/Air Bill No.	27.2	4728
Protocol N/A					Data Turnaround		Parts and Retum No. 4/310		
Sample No.	LabID	٠	Date .	Time	No./Type Container	Sam	Sample Analysis		Preservative
	S16T029431	Z,	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-EFF-BASE-A	1		CHILL -4C
	S16T029432	A.V	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-EFF-BASE-B			CHILL -4C
	S16T029433	\$	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-A-PRT-A	4.		CHILL -4C
	S16T029434	\$	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-A-PRT-B			CRILL -4C
	\$161029435	5	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-B-PRI-A			CHILL -4C
	S16T029436	2	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-B-PRT-B			CHILL -4C
	\$161029437	\$	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-BASE-A			CHILL -4C
	\$161029438	5	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-BASE-B			CHILL -4C
	S16T029439	V.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-C-PRT-A			CHILL -4C
	S16T029440	V.	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-C-PRT-B			CHILL -4C
OSSIBLESA	WIPLE HAZARDS/F	REMA	RKS (List all)	cnown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Special Weald IV, Carl W Bowalderl.gov, and Greg Moore, Gregory_3_Moore@fl.gov see SOW for email Reference Contract # 55502 NIOSH 1024 CHILL BELOW -4 C	Howald IV. Howeld IV. See SOM for email 502	Hold Time	
Relinquished By Prince In Co. Relinquished Bredishel	Madisher All	1 3 9	Sign Ju	3 6	Date/Time Rec	A Gradistical Sign RPS Aulia Crael Col. FEDEX		Matrix* = Soil DL = Sediment T = Solid WI = Sludge L	= Drum Liquids = Tissue = Wipe = Liquid
Relinquished By	70 A	10 Li			1	Received By Alfridge Algor Albury Received By	9 Sterlime W Daterlime DS	= Water	= Vegetation = Vapor = Other
FINAL SAMPLE DISPOSITION		(e.g.,	Retum to cust	tomer, per	Disposal Method (e.g., Retum to customer, per lab procedure, (used in process)	process) Disposed By	Rejub 091	Date/Time Date/Time	0091

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					CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	.YSIS REQUEST	Page	4 of 4
Collector					Contact/Requestor		Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	ATION	Purchase Order/Charge Code 202062/ca20		
Project Title	UNTION				Logbook/ Work Package No.	ackage No.	loe Chest No. Lot 1-0.23	1033 Temp. O. D. D. C.	17
Shipped To (Lab)	(q.				Method of Shipment	ent	Bill of Lading/Air Bill No.	75	27704728
Protocol N/A					Data Turnaround		Parts and Return No.		
Sample No.	Lab ID	٠	Date	Time	No.∕Type Container	Sample	Sample Analysis		Preservative
	S16T029441	\$	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-D-PRI-A	, ,		CHILL -4C
	S16T029442	5	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-D-PRI-B			CHILL -4C
	S16T029443	\$	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-E-PRT-A	•		CHILL -4C
	S16T029444	8	91/01/60	n T	CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-E-PRT-B	٠.		CHILL -4C
	S16T029445	N.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-F-PRT-A	, ,		CHILL -4C
	S16T029446	V.A	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-F-PRT-B	٠,		CHILL -4C
	S16T029447	8	91/01/60	1.7	CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-G-PRT-A	*		CHILL -4C
	S16T029448	\$	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-G-PRT-B			CHILL -4C
	\$167029449	85	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-9-IN-H-PRT-A	, ,	100	CRILL -4C
	\$16T029450	N.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-07837-10-IN-H-PRT-B			CRILL -4C
POSSIBLE SA	MPLE HAZARDS/R	EMA	RKS (List all F	nown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results; 5.0 carl W Bowald IV, Carl W Howalder.gov, and Greg Moore, Gregory_S_Moore@el.gov see SOM for email Reference Contract # 55502 REIERSE 9 NIOSH 1024 CHILL BELOW -4 C	wald IV, 1 Greg Moore, se SOW for email 12	Hold Time	() () ()()()
Relinquished By Print Relinquished By Gradisher	Print 126/ K	3 0	Sign Sugar Mr	19 July 19	Date/Time	Received By Gradishing Sign WRPS GALLE Fuel Ch. 9/14/	Date/Time	0 0 0	
WRPS Relinquished By	多	2	2000		Date/Time	Received By Mands Man Grish	AICI Date/Time		
Relinquished By					Date/Time Rec	Selved By	Date/Time	A = Air X DS = Drum Solids	= Other
FINAL SAMPLE DISPOSITION	Disposal Meth	e.g.,	Return to cust	omer, per	od (e.g., Retum to customer, per lab procedure/used in process)	process) Disposed By	Rejali	Date/Time 69/21/16	1600
						1,40	1	5	٠

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Report Date: September 21, 2016

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

Robert (Buddy) Sosa

Richland, WA 99352

Washington River Protection So PO Box 850, MSIN T6-02

1.3-Butadiene	< 0.0010	NA	NA	0.	0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/san	nple)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent To lume Not Provid		Analyzed: 09/21/2016
Sample ID: \$16T029451 Lab ID: 1625957001	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	, ,	010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam	nla)
Method: NIOSH 1024	Sam	Media: SKO pling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		nalyzed: 09/21/2016
Sample ID: \$16T029452 Lab ID: 1625957002	Sa	mpling Location: CAR	RTRIDGE EVALU		ollected: 09/10/2016 eceived: 09/15/2016

Sample ID: \$16T029453 Lab ID: 1625957003	Sa	mpling Location: CAF	RTRIDGE EVALU		collected: 09/10/2016 eceived: 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		Analyzed: 09/21/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam	ple)
1,3-Butadiene	<0.0010	NA	NA	0.0	010

	Result				
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029454 Lab ID: 1625957004	Sa	mpling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1 801 266 7700 | FAX +1 801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

Environmental 🧎

www.alsglobal.com

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IHREP-V12.3



Anal	vtical	Resul	ts

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC pling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		ed: 09/21/2016
Sample ID: \$16T029455 Lab ID: 1625957005	Sa	mpling Location: CAF	RTRIDGE EVALU		ed: 09/10/2016 ed: 09/15/2016

1,3-Butadiene	<0.0010	NA	NA		.0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sar	nple)
Method: NIOSH 1024	San	Media: SKC npling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: \$16T029456 Lab ID: 1625957006	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010)}
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid		/zed: 09/21/2016
Sample ID: \$16T029457 Lab ID: 1625957007	Sa	mpling Location: CAI	RTRIDGE EVALU	1,30,000	cted: 09/10/2016 ived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air \	226-37 Sorbent Tu olume Not Provid		zed: 09/21/2016
Sample ID: \$16T029458 Lab ID: 1625957008	Sa	mpling Location: CAF	RTRIDGE EVALU	100	ted: 09/10/2016 /ed: 09/15/2016

(mg/sample)	Result (mg/m³)	result (bhill)	rat (mys	ampre)
Result	Doordt (marine)	Result (ppm)	RL (mg/sa	annul al
Sam				Analyzed: 09/21/2016
Sa	mpling Location: CAF	RTRIDGE EVALU	ATION	Collected: 09/10/2016 Received: 09/15/2016
	Sam Result	Media: SKC Sampling Parameter: Air \ Result	Media: SKC 226-37 Sorbent To Sampling Parameter: Air Volume Not Provid Result	



Δn	alve	tical	Res	ulte
~	CU V	uvai	1/63	uits

1,3-Butadiene	<0.0010	NA	NA	0.0010)
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample))
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: S16T029460 Lab ID: 1625957010	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

raisayso	(mg/sumple)	result (ing/ii)	resur (ppm)	ree (mg/seampr	~ <i>j</i>
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sampl	e)
Method: NIOSH 1024	Sam	Media: SKO ppling Parameter: Air V	226-37 Sorbent Tu /olume Not Provid		alyzed: 09/21/2016
Sample ID: S16T029461 Lab ID: 1625957011	Sa	mpling Location: CAF	RTRIDGE EVALU		lected: 09/10/2016 ceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	1
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam		zed: 09/21/2016		
Sample ID: \$16T029462 Lab ID: 1625957012	Sa	mpling Location: CAF	RTRIDGE EVALU	1,3,2,4,4	ted: 09/10/2016 ved: 09/15/2016

Sample ID: \$16T029463 Lab ID: 1625957013	Sa	mpling Location: CAF	RTRIDGE EVALU	Collected: 09/10/201 ATION Received: 09/15/201
Method: NIOSH 1024	San	Media: SKC	226-37 Sorbent Tu Volume Not Provid	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

1.3-Butadiene	< 0.0010	NA	NA	0	.0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sar	mple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029464 Lab ID: 1625957014	Sa	mpling Location: CAF	TRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



		_	
Analy	vtical	Resul	ts

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		ed: 09/21/2016
Sample ID: \$16T029465 Lab ID: 1625957015	Sa	mpling Location: CAF	RTRIDGE EVALU		ed: 09/10/2016 ed: 09/15/2016

1,3-Butadiene	<0.0010	NA	NA		0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sam	nple)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029466 Lab ID: 1625957016	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam		zed: 09/21/2016		
Sample ID: S16T029467 Lab ID: 1625957017	Sa	mpling Location: CAF	RTRIDGE EVALU	1,30,30,30	ted: 09/10/2016 ved: 09/15/2016

1.3-Butadiene	< 0.0010	N/	A NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³) Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	San		SKC 226-37 Sorbent To Air Volume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029468 Lab ID: 1625957018	Sa	ampling Location:	CARTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0	0.0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sa	mple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu /olume Not Provid	297,000	Analyzed: 09/21/2016
Sample ID: S16T029469 Lab ID: 1625957019	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



An	alve	tical	Ro	sults
MI	alv	lita	L G	suits

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC pling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		9/21/2016
Sample ID: \$16T029470 Lab ID: 1625957020	Sa	mpling Location: CAF	RTRIDGE EVALU	Collected: (ATION Received: (

1,3-Butadiene	<0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sam	nple)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		Analyzed: 09/21/2016
Sample ID: S16T029471 Lab ID: 1625957021	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKO ppling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		ed: 09/21/2016
Sample ID: S16T029472 Lab ID: 1625957022	Sa	mpling Location: CAF	RTRIDGE EVALU	1,3,3,1,3,4,4	ed: 09/10/2016 ed: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0	0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/san	nple)
Method: NIOSH 1024	San	Media: SKC opling Parameter: Air	226-37 Sorbent Tu Volume Not Provid		Analyzed: 09/21/2016
Sample ID: \$16T029473 Lab ID: 1625957023	Sa	mpling Location: CAF	RTRIDGE EVALU	12	Collected: 09/10/2016 Received: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0	0.0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sa	mple)
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu /olume Not Provid	227,000	Analyzed: 09/21/2016
Sample ID: S16T029474 Lab ID: 1625957024	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



Analy	rtical	Resu	ts

1,3-Butadiene	<0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKC pling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029475 Lab ID: 1625957025	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.00	110
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	ile)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		nalyzed: 09/21/2016
Sample ID: S16T029476 Lab ID: 1625957026	Sa	mpling Location: CAF	RTRIDGE EVALU		ollected: 09/10/2016 eceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid		alyzed: 09/21/2016
Sample ID: \$16T029477 Lab ID: 1625957027	Sa	mpling Location: CAF	RTRIDGE EVALU	1,5-5	ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029478 Lab ID: 1625957028	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA		0.0010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sa	mple)
Method: NIOSH 1024	Sam	Media: SKO pling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid	257.0709	Analyzed: 09/21/2016
Sample ID: S16T029479 Lab ID: 1625957029	Sa	mpling Location: CAF	RTRIDGE EVALU		Collected: 09/10/2016 Received: 09/15/2016



Analy	∕tical	Resul	ts

1,3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		zed: 09/21/2016
Sample ID: \$16T029480 Lab ID: 1625957030	Sa	mpling Location: CAF	RTRIDGE EVALU		ted: 09/10/2016 ved: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sampl	e)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		alyzed: 09/21/2016
Sample ID: S16T029481 Lab ID: 1625957031	Sa	mpling Location: CAF	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Sam	Media: SKO ppling Parameter: Air V	226-37 Sorbent Tu Volume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029482 Lab ID: 1625957032	Sa	mpling Location: CAF	RTRIDGE EVALU	1,2,2,0	ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.00	010
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	ole)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air \	226-37 Sorbent Tu olume Not Provid		nalyzed: 09/21/2016
Sample ID: \$16T029483 Lab ID: 1625957033	Sa	mpling Location: CAF	RTRIDGE EVALU		ollected: 09/10/2016 eceived: 09/15/2016

Sample ID: S16T029484					Collected: 09/10/2016
Lab ID: 1625957034	Sa	mpling Location: CAI	RTRIDGE EVALU	ATION	Received: 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid	257,600	Analyzed: 09/21/2016
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/s	ample)
1,3-Butadiene	<0.0010	NA	NA		0.0010



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1,3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Method: NIOSH 1024	Sam	Media: SKC pling Parameter: Air N	226-37 Sorbent Tu /olume Not Provid		lyzed: 09/21/2016
Sample ID: \$16T029485 Lab ID: 1625957035	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	<0.0010	NA	NA	0.00	10
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/samp	le)
Method: NIOSH 1024	Sam	Media: SKC npling Parameter: Air \	226-37 Sorbent Tu /olume Not Provid		nalyzed: 09/21/2016
Sample ID: S16T029486 Lab ID: 1625957036	Sa	mpling Location: CAF	RTRIDGE EVALU		llected: 09/10/2016 ceived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.0010	
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)	
Method: NIOSH 1024	Sam	Media: SKO npling Parameter: Air \	226-37 Sorbent Tu Volume Not Provid		ed: 09/21/2016
Sample ID: \$16T029487 Lab ID: 1625957037	Sa	mpling Location: CAF	RTRIDGE EVALU	1,3,2,1,3,2,4,	ed: 09/10/2016 ed: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	0.001	0
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample	e)
Method: NIOSH 1024	Sam	Media: SKC ppling Parameter: Air \	226-37 Sorbent Tu olume Not Provid		alyzed: 09/21/2016
Sample ID: S16T029488 Lab ID: 1625957038	Sa	mpling Location: CAF	RTRIDGE EVALU		ected: 09/10/2016 eived: 09/15/2016

1.3-Butadiene	< 0.0010	NA	NA	11	0.0010	
Analyte	Result (mg/sample)	Result (mg/m²)	Result (ppm)	RL (mg/sa	ample)	
Method: NIOSH 1024	Sam	Media: SKO	226-37 Sorbent Tu Volume Not Provid	257,000	Analyzed: 09/	21/2016
Lab ID: 1625957039	Sa	mpling Location: CAF	RTRIDGE EVALU	ATION	Received: 09/	
Sample ID: S16T029489					Collected: 09/	10/2016



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	Sa	impling Location: CAF	RTRIDGE EVALU	ATION Received: 09/15/2016
Method: NIOSH 1024	San	Media: SKO	226-37 Sorbent Tu Volume Not Provid	
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	
NIGOU 4004	/S/ Fred Rejali	/S/ John M. Reynolds	
NIOSH 1024	09/21/2016 15:53	09/21/2016 16:20	

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



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/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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.com

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 Envrionmental 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

IHREP-V12.3



Quality Control Sample Batch Report

Analysis Information

Workorder: 1625957

Limits: Historical/Performance Analysis: NIOSH 1024 Preparation: NA

Batch: IFID/7770 (HBN: 176979) Basis: ALS Laboratory Group Batch: NA

Prepared By: NA Analyzed By: Fred Rejali

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

Result RL Analyte 1,3-Butadiene ND 0.00100

MB: 519110 Analyzed: 09/21/2016 00:00

Units: mg/sample

Analyte MDL Result RL 1,3-Butadiene ND 0.00100

MB: 519113

Analyzed: 09/21/2016 00:00

Units: mg/sample

Analyte Result MDL RL 1,3-Butadiene 0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519102 LCSD: 519103 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1 Dilution: 1

Units: mg/sample

Units: mg/sample % Rec %Rec QC Limits Result RPD QC Limits Analyte Result Target 1,3-Butadiene 0.0259 0.0274 78.0 0.0 20.0 94.7 117.6 0.0261 95.4 0.769

LCS: 519105 LCSD: 519106 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample %Rec QC Limits Result % Rec RPD QC Limits Analyte Result Target 20.0 1,3-Butadiene 0.0262 0.0274 95.8 78.0 117.6 0.0254 3.10 0.0

Page 1 of 2 Wednesday, September 21, 2016 1625957 - Page 11 of 16 QCS V4.1



Quality Control Sample **Batch Report**

Analysis Information

Workorder: 1625957

Limits: Historical/Performance Preparation: NA Analysis: NIOSH 1024

Basis: ALS Laboratory Group Batch: NA Batch: IFID/7770 (HBN: 176979) Prepared By: NA Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 519108 LCSD: 519109 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00

Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Analyte %Rec QC Limits Result % Rec RPD QC Limits Result Target

1,3-Butadiene 0.0274 0.0274 100 78.0 117.6 0.0272 99.4 0.733 0.0 20.0 LCSD: 519112

LCS: 519111 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00

Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Analyte QC Limits Result QC Limits Result Target %Rec % Rec RPD 1.3-Butadiene 0.0285 0.0274 104 78.0 117.6 0.0298 4.46 20.0

0.0 LCS: 519114 LCSD: 519115 Analyzed: 09/21/2016 00:00 Analyzed: 09/21/2016 00:00 Dilution: 1 Dilution: 1

Units: mg/sample Units: mg/sample Result % Rec Analyte Result Target %Rec QC Limits 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	/S/ John M. Reynolds	
09/21/2016 15:58	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

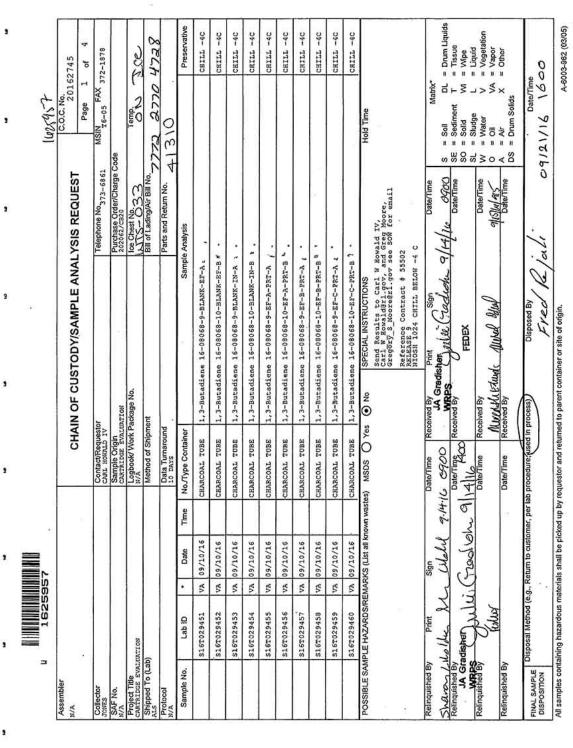
. Result is above the calibration range

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



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					7HO	CHAIN OF CLISTODY/SAMPLE ANALYSIS RECLIEST	VSIS REDIEST	20162/45	62/45
.0					5		i dio negoto	Page 2	of 4
Collector					Contact/Requestor		Telephone No 373-6861	MSIN FAX 372-1878	372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 202062/CB20		
Project Title	TUATION				Logbook/ Work Package No.		loe Chest No.	Temp.	100
Shipped To (Lab)	ab)				Method of Shipment		Bill of Lading/Air Bill No.		J
Protocol N/A					Data Tumaround		Parts and Return No. 41310	310	087
Sample No.	Lab ID		Date	Time	No /Type Container		Sample Analysis		Preservative
	S16T029461	K	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-D-PRT-A 4			CHILL -4C
	\$167029462	K.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-D-PRT-B,	٠		CRILL -4C
	S16T029463	8	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-E-PRT-A '			CHILL -4C
	S16T029464	VA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-E-PRT-B ;			CRILL -4C
	S16T029465	8	VA 09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-F-PRT-A ,	* 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0 - 0		CHILL -4C
	S16T029466	VA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-F-PRT-B		E	CHILL -4C
	S16T029467	K.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-G-PRT-A ;			CHILL -4C
	S16T029468	VA	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-G-PRT-B "			CHILL -4C
	S16T029469	N.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EF-H-PRT-A ,	•	100	CHILL -4C
	S16T029470	S.	VR, 09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EF-H-PRT-B 4		2.	CHILL -4C
POSSIBLE S.	AMPLE HAZARDS/R	EMA	RKS (List all k	nown wast	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes . ③ No	SPECIAL INSTRUCTIONS Seaf Results to Carl W Gowald IV, Call W Bowald&Ligov, and Greg Moore, Gregory_S_Moore@il.gov see SOM for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CELLL BELOW -4 C	W	Hold Time	
Relinquished By	ij (1	Sigh	1.41-6	Mild 9-14-16 0980 6	Received & Gradisher Sign Of 14/16	Date/Time OG/DD	Matrix*	= Drum Liquids
Relinquished By Gradishe, WRPS		U	Light Lad Lahr	10/	0	D	Date/Time SE SO	= Sediment T = Solid WI = Studge	= Tissue = Wipe
Relinquished By Relinquished By	of Caler	7			Date/Time Re	Received By Received By Received By		= Water V = Oil VA = Air X = Drum Solids	
FINAL SAMPLE DISPOSITION	Disposal Met	e.g.	Return to cust	omer, per t	hod (e.g., Return to customer, per lab procedure, used in process)	Disposed By Fred (a)	int. 09121116	Date	VIIme 1 6 0 0
All samples co	ntaining hazardous n	naten	ials shall be pi	cked up by	requestor and return	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A.	A-6003-962 (03/05)

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Assembler N/A					CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	LYSIS REQUEST	C.O.C. No. 20162745	2745
							-5	Page 3	of 4
Collector					Contact/Requestor	lor.	Telephone No ₃₇₃ -6861	MSIN FAX 3	FAX 372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	MATION	Purchase Order/Charge Code 202062/c820		
Project Title	LUATION				Logbook/ Work Package No.	Package No.	le chest No. 033	1 780g	275
Shipped To (Lab)	(qe				Method of Shipment	ent .	Bill of Lading/Air Bill No.		xcrn
Protocol N/A					Data Tumaround 10 Days		Parts and Return No. 41310	1 34	
Sample No.	Cab ID	Ŀ	Date	Time	No ∕Type Container		Sample Analysis		Preservative
	S16T029471	Z,	09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-EFF-BASE-A			CHILL -4C
87	S16T029472	V.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-EFF-BASE-B			CHILL -4C
	\$161029473	\$	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-A-PRT-A &	•		CHILL -4C
	S16T029474	\$	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-A-PRT-B			CHILL -4C
	\$16029475	5	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-B-PRT-A			CHILL -4C
	S16T029476	82	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-B-PRT-B			CHILL -4C
	S16T029477	K	VA 09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-BASE-A (•		CHILL -4C
	S16T029478	V.	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-BASE-B 9			CHILL -4C
	S16T029479	N.	VA 09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-C-PRT-A			CHILL -4C
	S16T029480	S	VA 09/10/16		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-C-PRT-B i			CRILL -4C
POSSIBLE SA	MAPLE HAZARDS/R	EMA	RKS (List all k	томп was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes	S O No SPECIAL INSTRUCTIONS Send Results to Carl W Howald IV, Carl W Howaldel-gov, and Greg Moore, Gregory_S_Mooreell-gov see SOW for email Reference Contract # 55502 RELEASE 9 NOSH 1024 CHILL BELOW -4 C	owald IV, c, d Gree Woore, ee Sow for email 02	Hold Time	
Skywo - Ulelle Relinquished By Pri Relinquished By	Prin Ligher	7	12 Lilah		Date/Time 09.00 Date/Time	Received by JA Gradisher Received by Received by FEDEX	9/14/16 0900 S DaterTime SE	Matrix* = Soil DL = Sediment T = Soil W	= Drum Liquids = Tissue = Wipe
Relinquished By Relinquished By						Received By Municipal Chult gluss Study Received By	Date/Time W A Date/Time DS	= Vater V = Oil VA = Air X = Drum Solids	
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure)	e.g.,	Return to cust	tomer, per		used in processy Disposed By Re.	Rejal 09121116	Date/Ti	me 1600
All samples cor	ntaining hazardous r	materi	ials shall be pi	icked up b	y requestor and retume	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A-6	A-6003-962 (03/05)

1625957 - Page 15 of 16

Page 4 Page 4 Page 5 P						CHA	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REDUEST	25.70707	07 . 70
Contact Requirement Contact Reduirement						5		1010111	Page	4 of 4
Sample Academy Constitution Principles Constitution Principles Code	Collector					Contact/Requesto	36	Telephone No ₃₇₃₋₆₈₆₁		
Logbook Work Package No. Logbook Work Work Package No. Logbook Work Work Work Work Work Work Package No. Logbook Work Work Work Work Work Work Work W	SAF No.					Sample Origin	ALION	Purchase Order/Charge C		
Parts and Return No. 7772 3770	Project Title	LUATION				Logbook/ Work P:	ackage No.	loe Chest No.		200
Date Time No.Type Container Sample Analysis Sample Analysis Sample Analysis Sample Analysis Sample Analysis 182 192	Shipped To (La	(qr				Method of Shipme	ent	Bill of Lading/Air Bill No.	2770	Jeruny.
10 10 10 10 10 10 10 10	Protocol					Data Turnaround		Parts and Return No.	310	
19710/16 CRRRCORL TOBE 1,3-Butadiene 16-08068-9-IN-D-PRT-B 1,3-Butadiene 1,3-B	Sample No.	Cl qe7		Date	Time	No./Type Container	Samp	ile Analysis		Preservative
483			-	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-D-PRI-A			CHILL -4C
485 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-A ; 486 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 487 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 488 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 489 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 489 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 489 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 489 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 481 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 482 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 483 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 484 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 485 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 16-08068-9-IN-E-PRT-B ; 485 Second MA ON SECOND 1.3-Butadians 10-10-IN-E-PRT-B ; 486 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 486 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 488 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 489 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-10-IN-E-PRT-B ; 480 VA 09/10/16 CHARCOAL TOBE 1.3-Butadians 10-				91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-D-PRI-B	-		CHILL -4C
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485 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-F-PRT-B 1, 487 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 488 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 489 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-9-IN-G-PRT-B 1, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-10-IN-G-PRT-B 1, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-10-IN-G-PRT-B 1, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-10-IN-G-PRT-B 1,3-Butadian 17, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-10-IN-G-PRT-B 1,3-Butadiane 17, 480 VA 09/10/16 CERROOL TUBE 1,3-Butadiane 16-08068-10-IN-G-PRT-B 1,3-Butadiane 16-08068-10-IN-G-PRT-B-PRT-B 1,3-Butadiane 16-08068-10-IN-G-PRT-B-P				91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-E-PRT-B	Į.		CRILL -4C
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489 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-G-PRT-B; 489 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 480 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 480 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 480 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 481 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 482 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 483 YR 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IR-PRT-B; 484 YR 09/10/16 CHARCOAL TUBE 1/3-Butadiene 16-08068-10-IR-PRT-B; 485 Send Results 2 CHARCOAL TUBE 16-08068-10-IR-PRT-B; 486 Send Results 2 CHARCOAL TUBE 16-08068-10-IR-PRT-B; 487 Send Results 2 CHARCOAL TUBE 16-08068-10-IR-PRT-B; 488 Send Results 2 CHARCOAL TUBE 16-08068-10-IR-PRT-B; 489 YR 09/10/16 CHARCOAL TUBE 16-08068-10-IR-PRT-B-IR				31/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-G-PRI-A			CHILL -4C
489 YA 09/10/16 CHARCOAL TUBE 1,3-Butadiene 16-08068-10-IN-H-PRT-B; ARDS/REMARKS (List all known wastes) MSDS Yes ON 10 SPECIAL INSTRUCTIONS ARDS/REMARKS (List all known wastes) MSDS OYes ON 10 SPECIAL INSTRUCTIONS ARDS/REMARKS (List all known wastes) MSDS Oyes O 10 ARDS/REMARKS (List all known wastes) MSDS Oyes Oyes Oyes ARDS/REMARKS (List all known wastes) MSDS Oyes Oyes AR				91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-G-PRI-B			CHILL -4C
APDENREWARKS (List all known wastes) MSDS Yes No SPECIAL INSTRUCTIONS SPECIAL I		7	V.A	91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-9-IN-H-PRI-A			CHILL -4C
APDS/REMARKS (List all known wastes) MSDS Yes No SPECIAL INSTRUCTIONS Secretary Secretar		185		91/01/60		CHARCOAL TUBE	1,3-Butadiene 16-08068-10-IN-H-PRT-B			CHILL -4C
int Sign Date/Time Received by Print Date/Time Received by Print Date/Time Received by Print Date/Time Received by Date/Time Received by Date/Time Received by Date/Time Received by Date/Time Received by Date/Time Received by Date/Time Received by Date/Time Date/Date/Date/Date/Date/Date/Date/Da	OSSIBLESA	MPLE HAZARDS/REN	MAR	<s (list="" all="" kr<="" th=""><th>nown was</th><th>les) MSDS 🔘 Yes</th><th>о_й •</th><th>iowald IV, id Greg Moore, ee SOW for email</th><th>Hold Time</th><th></th></s>	nown was	les) MSDS 🔘 Yes	о _й •	iowald IV, id Greg Moore, ee SOW for email	Hold Time	
int Sign Date/Time Received by Print Sign Date/Time Preceived by Print Sign Date/Time Date/Date/Date/Date/Date/Date/Date/Date/			1	72			Reference Contract # 555 RELEASE 9 NIOSH 1024 CHILL BELOW -	.4 C		
Date/Time SE = Sediment T FEDEX Multiple Constitution Customer, per lab procedure, keed in process) Date/Time Received By Disposed By FFLEX Date/Time SE = Sediment T SC =	Relinquished B	Hold	1 3	Sign	2	M1C 69€	23	III. OGOD	= Soil	x* L = Drum Liquids
Date/Time Received By Date/Time Received By Date/Time Date/Time Water V	Relinquished B	2	0	Jeston	0.44	Date/Time Rec		Date/Time	= Sediment = Solid	
Disposal Method (e.g., Return to customer, per lab procedure, keed in process) Disposed By Dis	Relinquished B	3				Date/Time Rec	Shunds	9//Clu.1965	= Water = Oil	
Disposal Method (e.g., Return to customer, per lab procedure, (seed in process) Disposed By Ref Community Con (2) 1/16	Relinquished B			¥		-		, Date/Time		= Other
	FINAL SAMPLE DISPOSITION		 8	sturn to custo	mer, per	lab procedure, kised in p	dsiQ	.7		me 1600

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C.3.10 Pyridines



ANALYTICAL REPORT

Report Date: September 22, 2016

Phone: (509) 373-1262

E-mail: robert_w_sosa@rl.gov

20162737

Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9

Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

Robert (Buddy) Sosa Washington River Protection So

PO Box 850, MSIN T6-02

Richland, WA 99352

Sample ID: S16T029491				Collected: 09/10/2016
Lab ID: 1625971001	Sa	mpling Location: CAI	RTRIDGE EVALUA	ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1 50mg Jolume Not Provid	Control of the Contro
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 Lab ID: 1625971002	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7 50mg Jolume Not Provid	
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	Sa	ampling Location: CA	RTRIDGE EVALUA	ATION Received: 09	/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 750mg Volume Not Provid		/20/2016
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	

ADDRESS 960 West LeVoy Drive, Salt Lake City, Utah, 84123 USA | PHONE +1801 266 7700 | FAX +1801 268 9992 ALS GROUP USA, CORP. An ALS Limited Company

Environmental 🎉

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IHREP-V12.3



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029494 Lab ID: 1625971004	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 09/20/2016 ed		
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 Lab ID: 1625971005	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 09/20/201		
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 Lab ID: 1625971006	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 09/20/2016 ed		
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 Lab ID: 1625971007	Sa	ampling Location: CAI	RTRIDGE EVALU		: 09/10/2016 : 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid		1: 09/20/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029498 Lab ID: 1625971008	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 09/20/2016 ed		
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 Lab ID: 1625971009	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San	Tube Analyzed: 09/20/2016 ed		
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 Lab ID: 1625971010	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/201 ATION Received: 09/15/201
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal 7/50mg Volume Not Provid	
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: \$16T029501				Collected: 09/10/2016
Lab ID: 1625971011	Sa	ampling Location: CAI	RIRIDGE EVALUA	ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	
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



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Ariarytica Nosaits					
Sample ID: S16T029502					Collected: 09/10/201
Lab ID: 1625971012	Sa	ampling Location: CA	RTRIDGE EVALUA	ATION	Received: 09/15/201
Method: NIOSH 1613 Mod.	San		226-01, Charcoal /50mg Volume Not Provid		Analyzed: 09/20/2016
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sa	mple)
Pyridine	<0.50	NA	NA		0.50
2,4-Dimethylpyridine	<0.50	NA	NA		0.50

Sample ID: S16T029503 Lab ID: 1625971013	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San	Fube Analyzed: 09/20/2016 ed		
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 Lab ID: 1625971014	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal 1 /50mg Volume Not Provid	
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	Sa	ampling Location: CAI	RTRIDGE EVALUA	ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 50mg Volume Not Provid	
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



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029506				Collected: 09/10/2016
Lab ID: 1625971016	Sa	mpling Location: CAI	RTRIDGE EVALUA	ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	
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 Lab ID: 1625971017	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	1/2
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: \$16T029508 Lab ID: 1625971018	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	
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 Lab ID: 1625971019	Sa	mpling Location: CAI	RTRIDGE EVALU		: 09/10/2016 : 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid		1: 09/20/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029510 Lab ID: 1625971020	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	The state of the s
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 Lab ID: 1625971021	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	
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: \$16T029512 Lab ID: 1625971022	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	
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	Sa	ampling Location: CA	RTRIDGE EVALU	ATION Received:	09/15/2016
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal /50mg Volume Not Provid		09/21/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029514 Lab ID: 1625971024	Sa	ampling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1 /50mg Volume Not Provid	
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 Lab ID: 1625971025	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	
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 Lab ID: 1625971026	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2 ATION Received: 09/15/2
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal 7/50mg Volume Not Provid	
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 Lab ID: 1625971027	Sa	ampling Location: CAI	RTRIDGE EVALU		: 09/10/2016 : 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid		: 09/21/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029518 Lab ID: 1625971028	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	The production of the control of the
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 Lab ID: 1625971029	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	16
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: \$16T029520 Lab ID: 1625971030	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/ ATION Received: 09/15/	
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid		2016
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 Lab ID: 1625971031	Sa	mpling Location: CAI	RTRIDGE EVALU		: 09/10/2016 : 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid		: 09/21/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Sample ID: S16T029522 Lab ID: 1625971032	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	Acceptable Commence C
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 Lab ID: 1625971033	Sa	ampling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	·
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 Lab ID: 1625971034	Sa	mpling Location: CAI	RTRIDGE EVALU	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 7/50mg Volume Not Provid	
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 Lab ID: 1625971035	Sa	mpling Location: CAI	RTRIDGE EVALUA		: 09/10/2016 : 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 750mg Volume Not Provid	Marka (filman f arka) 1 (c	: 09/22/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9 Project Manager: Rand Potter

Analytical Results

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Sample ID: S16T029526 Lab ID: 1625971036	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1 50mg Volume Not Provid	
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 Lab ID: 1625971037	Sa	mpling Location: CAI	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	•
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 Lab ID: 1625971038	Sa	ampling Location: CAI	RTRIDGE EVALU	Collected: 09/10/20 ATION Received: 09/15/20
Method: NIOSH 1613 Mod.	San		C 226-01, Charcoal 7/50mg Volume Not Provid	
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	Sa	ampling Location: CA	RTRIDGE EVALU	ATION Received	09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal /50mg Volume Not Provid		: 09/22/2016
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	



Workorder: 34-1625971

Client Project ID: CARTRIDGE EVALUATION Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T029530 Lab ID: 1625971040	Sa	ampling Location: CA	RTRIDGE EVALUA	Collected: 09/10/2016 ATION Received: 09/15/2016
Method: NIOSH 1613 Mod.	San		226-01, Charcoal 1/50mg Volume Not Provid	
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

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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	
NIOCH 1613 Mod	/S/ David Teynor	/S/ Thomas J. Masoian	
NIOSH 1613 Mod.	09/22/2016 12:50	09/22/2016 14:28	

Laboratory Contact Information

ALS Environmental Phone: (801) 266-7700 960 W Levoy Drive Email: alslt.lab@ALSGlobal.com Salt Lake City, Utah 84123 Web: www.alsslc.com

IHREP-V12.3



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://nealth.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	lowa	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
	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
Industrial Hygiene	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Lead Testing:			
CPSC	ANAB (ISO 17025, CPSC)	ADE-1420	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)	ADE-1420	http://www.aclasscorp.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, Averified 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 Envrionmental 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

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Quality Control Sample Batch Report

Analysis Information

Workorder: 1625971

 Limits: Historical/Performance
 Preparation: NA
 Analysis: NIOSH 1613 Mod.

 Basis: ALS Laboratory Group
 Batch: NA
 Batch: ISVO/3146 (HBN: 176816)

 Prepared By: NA
 Analyzed By: David Teynor

Blank

LMB: 518626 Analyzed: 09/20/2016 10:52

Units: ug/sample

arriter agreempre			
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: 5 Analyzed: 0 Dilution: 1 Units: u		1:31		
Analyte	Result	Target	%Rec	QC LI	mits	Result	% Rec	RPD	QC LI	mits
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	/S/ Thomas J. Masoian	
09/22/2016 12:39	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 Preparation: NA
Basis: ALS Laboratory Group 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 LI	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.		
2.4-Dimethylovridine	0.547	1.00	54.7	51.7	130.6	0.537	53.7	1.85	0.0	22.		

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	/S/ Thomas J. Masoian	
09/22/2016 12:50	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

QCS V4.1

Assembler N/A								600	
					СНА	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	1627	37 of 4
Collector					Contact/Requestor	10	Telephone No.373-6861	AX 372	1878
SAF No.					Sample Origin		Purchase Order/Charge Code		
Project Title					Logbook/ Work Package No.	ackage No.	Ice Chest No	Temp.	
Shipped To (Lab)	ab)				Method of Shipment	ent	Bill of Lading/Air Bill No.	35 ON	7 (2
Protocol N/A					Data Turnaround			212 2111	1104128
Sample No.	Cli qe T	Ŀ	Date:	Time	No./Type Container		Sample Analysis		Preservative
	\$16T029491	2	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-IN-A	a	Z	N/A
	\$16T029492	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-B , .	٠	Z	N/A
	S16T029493	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-C	a	Z	N/A
	\$16T029494	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-D.		Z	N/A
	\$16T029495	٧A	91/01/60	30000	CHARCOAL TUBE	Pyridines 16-07837-11-IN-E		Z	N/A
	\$16T029496	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-F ·	7	N	N/A
	S16T029497	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-G · ·		2	N/A
	S16T029498	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-IN-H '.	`	Z	N/A
	\$16T029499	V.	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-A, '		ž	N/A
	S16T029500	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-B ' .		Z	N/A
POSSIBLE S/	MPLE HAZARDS/F	REMAI	RKS (List all k	nown was	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS 🔘 Yes 💿 No		ald IV and Greg be SOW for email	Hold Time	a.
Relinguished By	Deint		55.0		Date(Time	RELEASE 9 Reference Contract # 55502			
Relinquished By Gradishar	CANER ALL	100	Jura	nen 9		WRPS Could Cooken 9/14 Received By	16 0900 s Date/Time SE	Matrix* = Soil DL = Sediment T	= Drum Liquids = Tissue
WRPS Relinquished By	STATE OF STA	9	1001001	5	Date/Time Rec	Received By Almold Clind	T	= Sludge L = Water V = Oil	= Liquid = Vegetation
Relinquished By	sy remai				177	Received By Addition of the Ad	DateTime A DS	= Air X = Drum Solids	Other
FINAL SAMPLE DISPOSITION	Disposal Method (e.g.,	(e.g.,	Return to custo	mer, per	Return to customer, per lab procedure, used in p	CONSUMED CONSUMED		9(19/1 12:00	:00:
All samples containing hazardous materials shall be picked up by requestor and returned to nation container or site of origin									

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Collector JONES SAF No.					1	CHAIN OF CLIS COLVISAMENT AND VSIS RECHES	VSIS REDIEST	7	16170707
Collector ONES SAF No.			9		5		200		2 of 4
SAF No.					Contact/Requestor	34	Telephone No ₃₇₃ -6861	MSIN T6-05	FAX 372-1878
//A					Sample Origin CARTRIDGE EVALUATION	ATION	Purchase Order/Charge Code		
Project Title	ALUATION				Logbook/ Work Package No.	ackage No.	loe Chest No.	Temp.	1100
Shipped To (Lab)	ab)				Method of Shipment	ent	Bill of Lading/Air Bill No.	217	15
Protocol N/A					Data Turnaround		Parts and Return No.	1	
Sample No.	. Lab ID	•:	Date	Time	No./Type Container	Samp	Sample Analysis		Preservative
	S16T029501	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-C	*		N/A
	\$16T029502	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-D . '	•		N/A
	S16T029503	VA	7A 09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-E	,		N/A
	S16T029504	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-F	4		N/A
	S16T029505	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-G · .			N/A
	S16T029506	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-EFF-H .	•	x	N/A
17	\$167029507	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-07837-11-BASE-EFF.	ś		N/A
	\$16T029508	VA	7A 09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-BASE-IN, .	r		N/A
	S16T029509	VA	VA 09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-BLANK1.	,		N/A
	S16T029510	N.	09/10/16		CHARCOAL TUBE	Pyridines 16-07837-11-BLANK2.	,		N/A
OSSIBLES	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	MAR	KS (List all kn	own wast	(es) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Noore Rough Howald@r1.gov and Carl Wowald@r1.gov and GregOfy_S_Noore@r1.gov see SOM for email	wald IV and Greg d see SOW for email	Hold Time	
						RELEASE 9 Reference Contract # 55502			
Relinquished By	Inquished By Print	. 3	. Sign	New	Date/Time Rec	P Gradi	14/10	Ma S = Soil	Matrix* DL = Drum Liquids
Relinquished Beradisher	أغذا	()	Cooker	9/4		Received By FEDEX	Date/Time	SE = Sediment SO = Solid	T = Tissue WI = Wipe
Relinquished By	DE SE				Date/Time Rec	Received By Millian J. Olina J. Olina J. Olina J.	Pls/lu/9/8		4
Relinquished By	By .				Date/Time Rec	served By	Date/Time	A = Air DS = Drum Solids	X = Other
FINAL SAMPLE DISPOSITION		g. 8	eturn to custo	mer, per l	Disposal Method (e.g., Return to customer, per lab procedure, used in process	CONSUMPY CONSUMPY		Date 0//19///	Date/Time
All camples co	Carrier and a Common American	1							

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Collector Jones SAF No. N/A Project Title					5	CHAIN OF COSTOD WAMPLE ANALYSIS REQUEST	TOIS REGUES!	Page 3 of	3 of 4
SAF No. N/A Project Title					Contact/Requestor		Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
Project Title	-				Sample Origin		Purchase Order/Charge Code		
CARINIDGE EVE	TUATION				Logbook/ Work Package No.	e No.	Ice Chest No.	> Temp.	12
Shipped To (Lab)	ab)				Method of Shipment		Bill of Lading/Air Bill No.	2111	8 CL7 0/1/C
Protocol N/A				×	Data Turnaround		Parts and Return No.		2
Sample No.	. Lab ID	•	Date	Time	No./Type Container	Sample	Sample Analysis		Preservative
	S16T029511	V.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-A			N/A
	S16T029512	K.	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-IN-B			N/A
	S16T029513	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-IN-C , *			N/A
	S16T029514	N.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-D , .			N/A
	S16T029515	V.	09/10/16		CHARCOAL TUBE	*			N/A
	S16T029516	K.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-F			N/A
er.	S16T029517	V.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-IN-G			N/A
	8161029518	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-IN-H .	4		N/A
	S16T029519	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-EPF-A . '	,		N/A
	S16T029520	V.	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-B . '			N/A
OSSIBLES	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	EMAR	RKS (List all k	nown was	tes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg None Carl W Howald@rl.gov and Gregory_S_Moore@rl.gov see SOW for email	d IV and Greg	Hold Time	
						RELEASE 9 Reference Contract # 55502			
Relinquished By P. J. 1979 E. Relinquished By A. L. 1979 E. L. 1979	Fully Ga &	3	sign Jun	1	Date/Time Reco	Received By Print Sign 9/14/ WRPS (Nadisher Nadican 9/14/ Received By	Date/Time	Ma = Soil = Sediment	trix* DL = Drum Liquids T = Tissue
WRPS Relinquished By	S Children	3	p mayon	0 14/16		Received By Almost Mi Wind Camil 01()		= Solid = Sludge = Water	WI = Wipe L = Liquid V = Vegetation
Relinquished By	By Target				1	·	7 1 13/w 1915 Date/frime	n Solids	11
FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, u	A, .e.a.	tetum to custo	omer, per	lab procedure, used in p	CONSUMEN CONSUMEN		My/16	() 0 : (7) 9
All samples co	And the Party of t								

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Collector									
Collector								Page 4 of	of 4
					Contact/Requestor	or	Telephone No ₃₇₃ -6861	MSIN FAX	372-1878
SAF No.	e				Sample Origin CARTRIDGE EVALUATION	NOTION	Purchase Order/Charge Code	10000	
Project Title	ALUATION				Logbook/ Work Package No.	ackage No.	Ice Chest No.	Temp.	1
Shipped To (Lab)	ab)				Method of Shipment	ent	Bill of Lading/Air Bill No.	١.	7 7
Protocol N/A				3.	Data Turnaround		Parts and Return No. 141218		
Sample No.	Cab ID	٠	Date	Time	No./Type Container	San	Sample Analysis		Preservative
	S16T029521	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-C ' ' 0			N/A
	S16T029522	V.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-D	•		N/A
	S16T029523	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-E			N/A
	S16T029524	VA	91/01/60		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-F. ,	7		N/A
	S16T029525	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFF-G			N/A
	S16T029526	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-EFE-H	•		N/A
	\$16T029527	N.	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-BASE-EFF .			N/A
	S16T029528	VA	09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-BASE-IN·			N/A
	\$16T029529	VA	VA 09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-BLANK-EFF .	,		N/A
	S16T029530	VA	VA 09/10/16		CHARCOAL TUBE	Pyridines 16-08068-11-BLANK-IN.			N/A
POSSIBLE S.	AMPLE HAZARDS/R	REMAI	RKS (List all k	nown wa:	POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Moore Carl W Howald@rl.gov and Gregory_S_Moore@rl.gov see SOW for email	owald IV and Greg nd see SOW for email	Hold Time	
-		-			ĺ	RELEASE 9 Reference Contract # 55502			
Relinquished By Island By Island By Relinquished Badisher	Surger Con	7	Sign Jung	9/14	Date/Time	Received By Gradisher Sign WRPS (ML) (Gael Oh, Seceived By CERDEY	# Date/Time OGOD Date/Time	= Soil DL E = Sediment T O = Solid WI	= Drum Liquids = Tissue = Wipe
Relinquished By	No.	5	}		Date/Time	Monday Chilmit Unial Shing Received By	Date/Time W 9 5 4 9 5 O Date/Time A Date/Time		= Liquid = Vegetation = Vapor = Other
Digital System	_	e.g., R	Return to custo	omer, per	Disposal Method (e.g., Return to customer, per lab procedure, used in probess)	process) Disposed By	_	S = Drum Solids	9
DISPOSITION	_				包			0/10/16 12:00	2:00
)				

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C.3.11 Nitrosamines

W609056 Rev. 2, Page 1 of 37

55503 R5



RJ LeeGroup, Inc. | Columbia Basin Analytical Laboratories 2710 North 20th Avenue, Pasco WA 99301 Tel: (509) 545-4989 | Fax: (509) 544-6010

Contract No.:

Carl Howald IV 11/18/16

Washington River Protection Solutions, LLC P.O. Box 850 MSIN H6-16 Richland, WA 99352

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-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	<u>Analyte</u>	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	

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Approved: 10/27/16 17:59

Report Template: WRPS_Nitrosamines 2.0.rpt Report Time Stamp: 11/18/16 15:27

, rij bbb onoor						
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 0	0
	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	٠
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	٠
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	٠
16-07837-12-IN-D	W609056-16	10/02/16	N-Nitrosopyrrolidine	< 0.021	0.021	µg/tube	٠
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	٠
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	٠
16-07837-12-IN-H	W609056-20	10/02/16	N-Nitrosopyrrolidine	< 0.021	0.021	µg/tube	٠
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	٠
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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16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosodi-n-propylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosomethylethylamine	< 0.019	0.019	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosomorpholine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-B	W609056-26	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosodiethylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosodimethylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosodi-n-butylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosodi-n-propylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosomethylethylamine	< 0.019	0.019	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosopiperidine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-C	W609056-27	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosodiethylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosodi-n-butylamine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosomethylethylamine	< 0.019	0.019	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosopiperidine	< 0.020	0.020	µg/tube
16-080	68-12-EFF-D	W609056-28	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosomethylethylamine	< 0.019	0.019	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-E	W609056-29	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-F	W609056-30	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosodimethylamine	<0.020	0.020	µg/tube
16-080	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosodi-n-butylamine	<0.020	0.020	µg/tube
	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosodi-n-propylamine	<0.020	0.020	µg/tube
	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosomethylethylamine	<0.019	0.019	µg/tube
	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosomorpholine	<0.020	0.020	µg/tube
16-080	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosopiperidine	<0.020	0.020	µg/tube
	68-12-EFF-G	W609056-31	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	µg/tube
16-080	68-12-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	٠
16-08068-12-EFF-H	W609056-32	10/04/16	N-Nitrosopyrrolidine	< 0.020	0.020	µg/tube	٠
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	Х
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	Х
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	٠
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	٠
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	٠
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	٠
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 IC	CV, CCVs, LCSs, RI	L 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.

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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.

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:

11/18/16

Scientist I Fernanda Pincheira

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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	Qualifier
16-07837-12-BASE-EFF S16T029531	W609056-01	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	D:
		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-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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifier
6-07837-12-EFF-B S16T029536	W609056-06	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	
6-07837-12-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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	
6-07837-12-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	
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-EFF-E S16T029539	W609056-09	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-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 \$16T029541	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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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-EFF-H S16T029542	W609056-12	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-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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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-IN-B S16T029544	W609056-14	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		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	х
		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	•
6-07837-12-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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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-IN-D S16T029546	W609056-16	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	÷.
		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	×
		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	٠
		09/10/16	10/02/16	N-Nitrosopyrrolidine	<0.021	0.021	•

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-07837-12-IN-F S16T029548	W609056-18	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		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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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifier
6-07837-12-IN-H S16T029550	W609056-20	09/10/16	10/02/16	N-Nitrosodiethylamine	<0.021	0.021	
		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	х
		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	•
6-08068-12-BASE-EFF \$16T029551	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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6-08068-12-BASE-IN S16T029552	W609056-22	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	1.3
		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	х
		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	
6-08068-12-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	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
6-08068-12-BLANK-IN \$16T029554	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	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	

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16-08068-12-EFF-A S16T029555	W609056-25	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-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 \$16T029557	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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6-08068-12-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	
6-08068-12-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	
6-08068-12-EFF-F \$16T029560	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 Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifier
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	
6-08068-12-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	х
		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 Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
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	
6-08068-12-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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Report Template: WRPS_Nitrosamines 2.0.rpt Report Time Stamp: 11/18/16 15:27

Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
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	х
		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	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
6-08068-12-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 Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
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	
		09/10/16	10/04/16	N-Nitrosopyrrolidine	<0.020	0.020	
6-08068-12-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	•

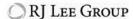
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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08068-12-IN-G S16T029569	W609056-39	09/10/16	10/04/16	N-Nitrosodiethylamine	<0.020	0.020	
		09/10/16	10/05/16	N-Nitrosodimethylamine	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	×
		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	
teport Qualifiers: = Target Analyte media breaktirough suspect, see unalyte = Rayest concentration rose above the instrument cullina = Analyte and quantitation limits, concentrati = Analyte detected below quantitation limits, concentrati = Library spectrum match, rsd -50% ws RT match w RPD (relative percent difference) outside accepted reco = Analyte analyzed for but not detected U/A = Not Applicable	tion range on is estimated		d = Data the H = Holding L = Sample of Q = Result of S = Spike Re	detected in the associated blank t exceeds the RSD criteria set by the St times for preparation or analysis exce oudition at receipt out of compliance or ut of method specific acceptance QC cr exceeps outside accepted recovery limits. Ps accredited analyte	oled vitis method defined condit viteria	tions	

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Carl Howald IV

Quality Control

RJ Lee Group No.: W609056 Samples Received: 09/14/16 Report Date: 11/18/16 COC No.: 20162738 Extraction Date: 09/21/16

Washington River Protection Solutions, LLC P.O. Box 850 MSIN H6-16 Richland, WA 99352

Client Project: Cartridge Evaluation

Analyte	CAS No.	Sample ID	Analyzed Date	Expecte d	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		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		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		10/05/16	0.200	0.192	0.98	0.196	97.9	1.87	
N-Nitrosodi-n-propylamine	621-64-7		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		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		10/04/16	0.200	0.178	0.86	0.207	103	2.57	
N-Nitrosomorpholine	59-89-2		10/05/16	0.200	0.186	0.98	0.190	94.7	4.64	
N-Nitrosomorpholine	59-89-2		10/05/16	0.200	0.191	0.98	0.196	97.5	2.36	
N-Nitrosopiperidine	100-75-4		10/01/16	0.200	0.183	0.96	0.191	95.4	3.98	
N-Nitrosopiperidine	100-75-4		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	Expecte d	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		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		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		10/05/16	0.200	0.211	1.02	0.208	104	3.64	
N-Nitrosomorpholine	59-89-2		10/01/16	0.200	0.199	0.97	0.206	103	4.25	
N-Nitrosomorpholine	59-89-2		10/04/16	0.200	0.210	1.01	0.208	103	2.97	
N-Nitrosomorpholine	59-89-2		10/04/16	0.200	0.171	0.86	0.198	98.9	2.57	
N-Nitrosomorpholine	59-89-2		10/05/16	0.200	0.200	0.98	0.204	102	4.64	
N-Nitrosomorpholine	59-89-2		10/05/16	0.200	0.200	0.98	0.205	102	2.36	
N-Nitrosopiperidine	100-75-4		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	Expecte d	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifie
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		10/04/16	0.200	0.199	1.01	0.197	98.4	2.97	
N-Nitrosomorpholine	59-89-2		10/04/16	0.200	0.169	0.86	0.196	98.2	2.57	
N-Nitrosomorpholine	59-89-2		10/05/16	0.200	0.203	0.98	0.207	104	4.64	
N-Nitrosomorpholine	59-89-2		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	Expecte d	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	МВ	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	мв	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	МВ	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	МВ	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		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		10/05/16		0.00	0.98	0.00			

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A-Nitrosopiperidine 100-75-4 MB 10/02/16 0.00 0.96 0.00	Analyte	CAS No.	Sample ID	Analyzed Date	Expecte d	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
A-Nitrosopiperidine 100-75-4 MB 10/04/16 0.00 0.99 0.00	N-Nitrosomorpholine	59-89-2	МВ	10/05/16		0.00	0.98	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 0.95 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 0.98 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/04/16 0.00 0.93 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 0.93 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 0.00 0.93 0.00 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.00 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 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.02 0.020 99.8 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.021 1.02 0.020 99.8 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.021 0.92 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 109 N-Nitrosodimethylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.00 0.022 109 N-Nitrosodimethylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.00 0.022 109 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.020 1.03 0.019 95.5 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.020 0.020 1.02 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020	N-Nitrosopiperidine	100-75-4	МВ	10/02/16		0.00	0.96	0.00			
N-Nitrosopiperidine 100-75-4 MB 10/05/16 0.00 0.95 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 0.93 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 0.82 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 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 0.93 0.00 N-Nitrosodiethylamine 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 10/05/16 0.020 0.021 1.00 0.021 106 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.021 1.00 0.021 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 110 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 119 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 119 N-Nitrosodin-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.021 1.01 0.021 104 N-Nitrosodin-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.021 1.01 0.021 104 N-Nitrosodin-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.98 0.022 108 N-Nitrosodin-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.022 108 N-Nitrosodin-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.022 108 N-Nitrosodin-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 103 N-Nitrosodin-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosomithylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.021 0.99 0.022 108 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.	N-Nitrosopiperidine	100-75-4	мв	10/04/16		0.00	0.99	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 0.82 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 0.00 0.82 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 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 10/05/16 0.020 0.019 0.97 0.020 98.1 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.02 0.020 97.8 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.00 0.021 106 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.02 0.022 114 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 119 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 119 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 1112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.99 0.022 1112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.021 1.01 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.98 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.99 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.020 0.09 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.020 0.021 0.00 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.020 0.021 0.00 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.021 0.08 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020	N-Nitrosopiperidine	100-75-4	MB	10/04/16		0.00	0.84	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 0.98 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 0.93 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 0.094 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 0.00 0.01 0.94 0.00 N-Nitrosodiethylamine 55-18-5 MRL 10/02/16 0.020 0.020 1.02 0.020 98.1 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.02 0.020 97.8 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.023 0.99 0.023 116 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 0.99 0.022 109 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 112 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 112 N-Nitrosodimethylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.99 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.002 0	N-Nitrosopiperidine	100-75-4	MB	10/05/16		0.00	0.95	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 0.93 0.00 N-Nitrosopyrrolidine 930-55-2 MB 10/05/16 0.00 0.01 0.93 0.00 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.019 0.97 0.020 98.1 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.02 0.020 97.8 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.00 0.021 106 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 1.02 0.020 99.8 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 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 0.99 0.023 116 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 0.99 0.022 109 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.022 1.01 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.98 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.98 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-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.98 0.021 104 N-Nitrosodi-n-propylamine 62-16-4-7 MRL 10/05/16 0.020 0.020 0.98 0.021 104 N-Nitrosodi-n-propylamine 62-16-4-7 MRL 10/05/16 0.020 0.020 0.09 0.020 102 N-Nitrosodi-n-propylamine 62-16-4-7 MRL 10/05/16 0.020 0.020 0.09 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.020 0.09 0.020 109 N-Nitrosomethylethylamine 10595-95-6 MRL 10/06/16 0.020 0.020 0.09 0.020 0.09 0.020 0.00	N-Nitrosopiperidine	100-75-4	мв	10/05/16		0.00	0.96	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 0.021 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.00 0.021 106 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 0.021 1.00 0.021 106 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.02 0.020 99.8 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 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 10/05/16 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 0.99 0.022 109 N-Nitrosodimethylamine 924-16-3 MRL 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.022 0.98 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.99 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.99 0.022 109 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.022 0.99 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.08 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosomi-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0.020 0	N-Nitrosopyrrolidine	930-55-2	MB	10/02/16		0.00	0.93	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 0.021 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.08 0.020 97.8 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.00 0.021 106 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/02/16 0.020 0.023 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.023 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.023 0.99 0.022 109 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.023 0.99 0.022 109 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 0.99 0.022 109 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.021 1.01 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.99 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosomethylethylamine 10595-95-8 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-8 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-8	N-Nitrosopyrrolidine	930-55-2	MB	10/04/16		0.00	0.98	0.00			
N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 0.02 98.1 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 0.02 99.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 0.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 0.08 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 0.021 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-N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.020 1.02 0.020 99.8 N-N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.023 0.99 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.023 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.023 0.99 0.022 109 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 0.99 0.022 109 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 1.01 0.022 112 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 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.89 0.022 108 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.99 0.021 104 N-Nitrosodi-n-propylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.99 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.99 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.99 0.022 108 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 0.99 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.020 99.0 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.09 0.020 99.0 0.	N-Nitrosopyrrolidine	930-55-2	MB	10/04/16		0.00	0.82	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 0.021 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.00 0.021 106 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 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 0.99 0.023 116 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 0.022 102 N-Nitrosodin-butylamine 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 0.022 1.01 0.022 112 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 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.98 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.96 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.96 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.021 103 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.021 103 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MR	N-Nitrosopyrrolidine	930-55-2	мв	10/05/16		0.00	0.93	0.00			
N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.02 0.020 97.8 N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 1.00 0.021 106 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 0.021 1.00 0.021 106 N-Nitrosodiethylamine 62-75-9 MRL 10/05/16 0.020 0.021 0.92 0.023 114 N-Nitrosodimethylamine 62-75-9 MRL 10/02/16 0.020 0.023 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/04/16 0.020 0.023 0.99 0.023 116 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 0.99 0.022 109 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 1.01 0.022 109 N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodimethylamine 924-16-3 MRL 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/06/16 0.020 0.022 1.01 0.022 112 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 10/05/16 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 0.020 0.96 0.021 104 N-Nitrosodi-n-propylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.96 0.021 104 N-Nitrosodi-n-propylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.96 0.021 104 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 1.00 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.022 108 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020	N-Nitrosopyrrolidine	930-55-2	MB	10/05/16		0.00	0.94	0.00			
N-Nitrosodiethylamine 55-18-5 MRL 10/04/16 0.020 0.021 0.88 0.024 120 0.10 N-Nitrosodiethylamine 55-18-5 MRL 10/05/16 0.020 0.021 1.00 0.021 106 0.10 0.10 0.021 106 0.10 0.10 0.021 106 0.10 0.021 1.00 0.021 106 0.10 0.10 0.10 0.10 0.10 0.10 0.10	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 10/05/16 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 0.023 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 10/05/16 0.020 0.022 1.01 0.022 112 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.021 1.03 0.019 96.5 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 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.98 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 10/05/16 0.020 0.020 1.00 0.020 102 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 10/04/16 0.020 0.021 0.98 0.021 105 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 10/05/16 0.020 0.021 0.98 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 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 10/05/16 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 0.99 0.022 112 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 0.021 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 0.021 1.01 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.022 0.84 0.026 129 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 10/05/16 0.020 0.022 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.020 0.020 1.00 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 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 0.021 105 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 10/05/16 0.020 0.021 0.98 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.88 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.08 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.02	N-Nitrosodiethylamine	55-18-5	MRL	10/04/16	0.020	0.021	0.88	0.024	120		
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 0.99 0.023 116 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 0.021 1.01 0.022 112 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 0.022 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 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/02/16 0.020 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.020 1.00 0.020 102 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 0.84 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 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.021 0.88 0.021 103 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 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomothylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.01 0.020 97.8	N-Nitrosodiethylamine	55-18-5	MRL	10/05/16	0.020	0.021	1.00	0.021	106		
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 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 1.00 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.020 1.00 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.04 0.025 124 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.084 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-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosodi-n-propylamine 10595-95-6 MRL 10/02/16 0.020 0.021 0.08 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.08 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.08 0.021 103 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 0.090 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.090 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 0.020 99.0 N-Nitrosomorpholine 59-89-2 MRL 10/05/16 0.020 0.020 1.01 0.020 97.8	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 10/04/16 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 0.021 1.01 0.021 104 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 10/05/16 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 0.020 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.020 1.00 0.020 102 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.018 89.1 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.08 0.025 124 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.98 0.022 108 N-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 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 0.022 108 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 0.021 0.98 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.08 0.021 103 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.08 0.021 103 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 0.090 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.090 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.090 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.090 0.020 99.0 N-Nitrosomorpholine 59-89-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodimethylamine	62-75-9	MRL	10/02/16	0.020	0.021	0.92	0.023	114		
N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 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 0.020 0.96 0.021 104 N-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 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 0.98 0.022 108 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 0.022 108 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 10/04/16 0.020 0.021 0.98 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.98 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 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 0.020 99.0 N-Nitrosomorpholine 59-89-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodimethylamine	62-75-9	MRL	10/04/16	0.020	0.023	0.99	0.023	116		
N-Nitrosodimethylamine 62-75-9 MRL 10/05/16 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-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 10/05/16 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-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 10/05/16 0.020 0.021 0.98 0.021 105 N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.021 0.98 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 0.099 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 N-Nitrosomorpholine 59-89-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodimethylamine	62-75-9	MRL	10/04/16	0.020	0.023	0.89	0.026	131		
N-Nitrosodi-n-butylamine 924-16-3 MRL 10/02/16 0.020 0.021 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 0.020 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 0.022 108 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 0.99 0.020 99.0 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 0.99 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 99.0 N-Nitrosomorpholine 59-89-2 MRL 10/05/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodimethylamine	62-75-9	MRL	10/05/16	0.020	0.022	0.99	0.022	109		
N-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.021 1.01 0.021 104 109-Nitrosodi-n-butylamine 924-16-3 MRL 10/04/16 0.020 0.022 0.84 0.026 129 109-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.96 0.021 104 104 109-Nitrosodi-n-butylamine 924-16-3 MRL 10/05/16 0.020 0.020 0.98 0.022 108 109-Nitrosodi-n-propylamine 621-64-7 MRL 10/02/16 0.020 0.020 1.00 0.020 102 102 109-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.018 1.02 0.018 89.1 109-Nitrosodi-n-propylamine 621-64-7 MRL 10/04/16 0.020 0.021 0.84 0.025 124 109-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.022 108 109-Nitrosodi-n-propylamine 621-64-7 MRL 10/05/16 0.020 0.021 0.98 0.021 105 105 105 105 105 105 105 105 105 10	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 10/04/16 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 0.022 108 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 0.020 0.99 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 99.0 N-Nitrosomethylethylamine 59-89-2 MRL 10/02/16 0.020 0.020 1.01 0.020 97.8	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 10/05/16 0.020 0.020 0.96 0.021 104 104 10/05/16 0.020 0.020 0.020 0.98 0.022 108 108 10/05/16 0.020 0.020 0.020 0.020 100 0.020 102 102 108 1.02 0.018 1.02 0.021 105 0.020 0.021 0.98 0.022 108 0.021 105 0.020 0.021 0.98 0.021 105 0.020 0.021 0.98 0.021 105 0.020 0.021 0.021 0.021 0.021 103 0.021 103 0.021 103 0.021 103 0.021 103 0.021 0.	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 10/05/16 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 0.022 108 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-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-Nitrosomethylethylamine 10595-95-8 MRL 10/05/16 0.020 0.020 1.02 0.020 97.8 N-Nitrosomorpholine 59-89-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodi-n-butylamine	924-16-3	MRL	10/04/16	0.020	0.022	0.84	0.026	129		
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 10/05/16 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 0.022 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-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 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 0.020 1.01 0.020 97.8	N-Nitrosodi-n-butylamine	924-16-3	MRL	10/05/16	0.020	0.020	0.96	0.021	104		
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 0.022 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-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 0.020 1.01 0.020 97.8	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 10/04/16 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-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 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-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 10/05/16 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 0.020 1.02 N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 N-Nitrosomethylethylamine 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-Nitrosodi-n-propylamine	621-64-7	MRL	10/04/16	0.020	0.018	1.02	0.018	89.1		
N-Nitrosomethylethylamine 10595-95-6 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-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-Nitrosodi-n-propylamine	621-64-7	MRL	10/04/16	0.020	0.021	0.84	0.025	124		
N-Nitrosomethylethylamine 10595-95-6 MRL 10/02/16 0.020 0.020 0.97 0.021 103 103 10595-95-6 MRL 10/04/16 0.020 0.022 1.03 0.021 103 103 10595-95-6 MRL 10/04/16 0.020 0.021 1.03 0.021 103 10595-95-6 MRL 10/04/16 0.020 0.021 0.88 0.024 121 10595-95-6 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 10595-95-6 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 10595-95-6 MRL 10/05/16 0.020 0.018 0.97 0.019 96.7 10595-95-8 MRL 10/05/16 0.020 0.020 0.020 1.01 0.020 97.8 10595-95-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	N-Nitrosodi-n-propylamine	621-64-7	MRL	10/05/16	0.020	0.021	0.98	0.022	108		
N-Nitrosomethylethylamine 10595-95-6 MRL 10/04/16 0.020 0.022 1.03 0.021 103 103 10595-95-6 MRL 10/04/16 0.020 0.021 0.88 0.024 121 10595-95-6 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 10595-95-6 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 102 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 10595-95-6 MRL 10/05/16 0.020 0.030 1.02 0.030 102 102 10595-95-6 MRL 10/05/16 0.020 0.030 1.01 0.030 96.7 10595-95-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8 100-1595-95-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8 10595-95-2 MRL 10/04/16 0.020 0.020 0.020 1.01 0.020 97.8 10595-95-2 MRL 10/04/16 0.020 0.020 0.020 0.020 1.01 0.020 97.8 10595-95-2 MRL 10/04/16 0.020	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 10/04/16 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-Nitrosomethylethylamine	10595-95-6	MRL	10/02/16	0.020	0.020	0.97	0.021	103		
N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 0.020 0.020 0.99 0.020 99.0 102 102 10595-95-6 MRL 10/05/16 0.020 0.020 1.02 0.020 102 102 107 107 107 107 107 107 107 107 107 107	N-Nitrosomethylethylamine	10595-95-6	MRL	10/04/16	0.020	0.022	1.03	0.021	103		
N-Nitrosomethylethylamine 10595-95-6 MRL 10/05/16 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-Nitrosomethylethylamine	10595-95-6	MRL	10/04/16	0.020	0.021	0.88	0.024	121		
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-Nitrosomethylethylamine	10595-95-6	MRL	10/05/16	0.020	0.020	0.99	0.020	99.0		
V-Nitrosomorpholine 59-89-2 MRL 10/04/16 0.020 0.020 1.01 0.020 97.8	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 0.021 0.86 0.024 122	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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Analyte	CAS No.	Sample ID	Analyzed Date	Expecte d	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 <math>D = Analyte analyzed in a dilution E = Report concentration was above the instrument calibration range
- 1 = Analyte detected below quantitation limits, concentration is estimated P = Library spectrum match, rsd >90% to RT match
- R = RPD (relative percent difference) outside accepted recovery limits U = Analyte analyzed for but not detected

Report Template: WRPS_Nitrosamines 2.0.rpt

- N/A = Not Applicable

- B = Analyte detected in the associated blank d = Data that exceeds the RSD criteria set by the SOP
- d = Data that exceeds the RSD criteria set by the SCP

 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 CC criteria

 S = Spike Roccery outside accepted accovery limits

 Z = Not ELAP accredited analyte

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AHA-LAP, LLC Lab ID 178656 EPA ID WAOI153 and WA DOE Lab ID CSS9. 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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Approved: 10/27/16 17:59 Report Time Stamp: 11/18/16 15:27

Assembler						10000		C.O.C. No.
N/A					٠ ٢	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	YSIS REQUEST	20162738
								Page 1 of
Collector					Contact/Requestor		Telephone No 373-6861	MSIN FAX 372-1878
SAF No.					Sample Origin CARTRIDGE EVALUATION	FION	Purchase Order/Charge Code 202062/CB20	
Project Title CARTRIDGE EVALUATION	ATION				Logbook/ Work Package No.		Ice Chest No.	TempO6.3
Shipped To (Lab)					Method of Shipment		Bill of Lading/Air Bill No.	
Protocol N/A					Data Turnaround		Parts and Return No.	
Sample No.	Lab ID		Date	Time	No./Type Container	Sample	Sample Analysis	Preservative
	S16T029531	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-BASE-EFF .		A/N
	S16T029532	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-BASE-IN .		A/N
	S16T029533	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-BLANK1 ·		A/N
	S16T029534	Ş	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-BLANK2		N/A
	S16T029535	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-A		A/N
	S16T029536	V.A.	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-B '-		A/N
	S16T029537	VV	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-C		A/N
	S16T029538	V.A	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-D		A/N
	S16T029539	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-E		N/A
	S16T029540	VA	91/01/60		Thermosorb-N	Nitrosamines 16-07837-12-EFF-F .		N/A
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)	PLE HAZARDS/	REMAR	KS (List all kno	own was	stes) MSDS O Yes	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl W Howald@rl.gov and Greg_S_Moore@rl.gov see 30% for email	ld IV & Greg Moore Greg_S_Moore@rl.gov	Hold Time
Prelinguished By	rner Me	\$	Sign	۵	Date/Time	RECEIVED BY Print Sign RE RINGOLS Sign RE RINGOLS 9-14-16	Date/Time	Matrix*
Ex Coques		$\mathbb{V}_{\mathbb{A}}$	9-14-16	16		Topic Clope 9-14-16	1243	= Solid = Sludge
Relinquished By	,	9			Date/Time R	Received By (V		= Water V =
Relinquished By					Date/Time R	Received By	Date/Time A	= Air X = Other S = Drum Solids
FINAL SAMPLE DISPOSITION	Disposal Method	(e.g., R	CONSUME	ner, per	Disposal Method (e.g., Return to customer, per lab procedure, used in process) CONSUNED	process) Disposed By La mill	101	Date/Time 3~3 €
All samples conta	ining hazardous	materia	als shall be pick	ked up t	y requestor and return	All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.		A 6003

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DISPOSITION	FINAL SAMPLE	Relinquished By	Relinquished By	Relinquished By Pr		POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)											Sample No.	Protocol N/A	Shipped To (Lab)	Project Title CARTRIDGE EVALUATION	SAF No.	Collector	Assembler N/A
	isposal Method		3			PLE HAZARDS/F	S16T029550	S16T029549	S16T029548	S16T029547	S16T029546	S16T029545	S16T029544	S16T029543	S16T029542	S16T029541	Lab ID			ATION			
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	omer, per la		9-14-16	uhner		nown waste											Time						
	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time	72:43 (Date/Time	Date/Time		MSDS O	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	Thermosorb-N	No./Type Container	Data Turnaround	Method of Shipment	Logbook/ Wor	Sample Origin CARTRIDGE EVALUATION	CARL HOWALD IV	우
	in process)	Received By	Received By	Received By Received By		Yes No	Nitrosamines	Nitrosami	Nitrosamines	Nitrosami	Nitrosami	Nitrosamines	Nitrosami	Nitrosamines	Nitrosami	Nitrosamines	her	nd	pment	Logbook/ Work Package No.	ALUATION	estor	IAIN OF CL
Her hills	Disposed By		1-41-10 KKI)	Sign Sign	CONTRACT 55503	SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Moore Carl W Howald@rl.gov and Greg_S_Moore@rl.gov see SOW for email	nes 16-07837-12-IN-H	Nitrosamines 16-07837-12-IN-G	nes 16-07837-12-IN-F	Nitrosamines 16-07837-12-IN-E	Nitrosamines 16-07837-12-IN-D	nes 16-07837-12-IN-C	Nitrosamines 16-07837-12-IN-5	nes 16-07837-12-IN-A -	Nitrosamines 16-07837-12-EFF-H	nes 16-07837-12-EFF-G	Sampl	0					CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST
		Date/Time	Date/Time	09 0		ald IV & Greg Moore Greg_S_Moore@rl.gov											Sample Analysis	Parts and Return No.	Bill of Lading/Air Bill No.	Ice Chest No.	Purchase Order/Charge Code 202062/CB20	Telephone No ₃₇₃₋₆₈₆₁	YSIS REQUEST
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All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.	DISPOSITION	_	Relinquished By	Relinquished By	REROSE	Relinquished By	Delinationed Bu	PUSSIBLE SAMPLE HAZAKUSIKEMAKAS (LISI BII KROWR Wastes)	\$16	\$16	316	S16	\$16	\$16	\$16	\$16	\$16	\$16	Sample No.	Protocol N/A	Shipped To (Lab)	Project Title	SAF No.	Collector	N/A
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A-6003-962 (03/05)	13:30	ĕ			= Wipe	= Drum Liquids = Tissue			N/A	A/N	N/N	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Preservative			1	4	372-1878	20162738 3 of 4

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		Code Temp. Tem	n process) Disposed By	eceived By	Ling	Print Sign	⊙ No	Nitrosamines 15-08068-12-IN-H	1	16-08068-12-IN-F		•	16-08068-12-IN-C .	•	16-08068-12-IN-A	Nitrosamines 16-08068-12-EFF-H ,			d	ment	Package No.	NOTAU	tor	AIN OF CUSTODY/SAMPLE A	101004050

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 μ g/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 $T_{standard}/T_{upstream}$.

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_{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 $(P_{upstream} - P_{tube}) \div P_{standard}$.

D.1

 $^{^{19}}$ Based on the standard temperature and pressure condition of P = 101325 Pa, R = 8.314 J/(mol.K), and T = 298.15 K.

For measurements made at the outlet of the respirator cartridge the pressure correction factor is $(P_{upstream} - P_{cartridge} - P_{tube}) \div P_{standard}$.

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
В	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.

OPC#	А	nalyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. D (%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%
			4						
1	Ammonia			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		8	8068-D1	0.020	1.0	2.0%	YES	
	1,3-Butadiene	10	8068-E1	0.020				2.1%
4	1,3-Butadiene	12	8068-E1	0.020	1.0	2.0%	YES	2.1%
4	1,3-Butadiene				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	0.00010	0.5	0.024%	123	0.021%
5	Benzene	16	7837-H2	0.00012	0.5	0.024%	YES	0.021%
5		2	8068-A1	0.00015			163	
	Benzene	4	8068-A1	0.00073	0.5	0.150%		0.021%
5	Benzene				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%

OPC#		Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. D (%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%
	1-Butanol		12	7837-F2	0.00079	20		YES	

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	0.00133	5.0	0.033%		0.002%
9	2-Hexanone	2	7837-A2	0.00009	5.0	0.002%		0.002%
9		4	7837-A2	0.00010	5.0	0.002%		
9	2-Hexanone	6	7837-62 7837-C2	0.00010	5.0		VEC	0.002%
	2-Hexanone	8	7837-C2 7837-D2	0.00008		0.002%	YES	0.002%
9	2-Hexanone				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	80000.0	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	80000.0	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	6	7837-C2	80000.0	0.5	0.015%	YES	0.017%
11	4-Methyl-2-hexanone	8	7837-D2	80000.0	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	80000.0	0.5	0.016%	YES	0.017%
11	4-Methyl-2-hexanone	10	8068-E1	80000.0	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	80000.0	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	0.71%		0.08%
		4	8068-B2	0.00044				
13	3-Buten-2-one	6	8068-C2	0.00044	0.2	0.22%		0.08%
13	3-Buten-2-one	8	8068-D2	0.00040	0.2	0.20%		0.08%
13	3-Buten-2-one				0.2	0.11%	V50	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%	5477	0.63%
14	Formaldehyde	4	7837-B1	0.0017	0.3	0.58%	YES	0.63%

14 Formaldehyde	COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
Formaldehyde	14	Formaldehyde	6	7837-C1	0.0018	0.3	0.59%	YES	0.63%
Formaldehyde	14	5-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4-4							0.63%
14 Formaldehyde									
Formaldehyde									
Formaldehyde									
14 Formaldehyde									
Formaldehyde		CI CLOSES DISCONDING PROCESS						YES	
Formaldehyde		The state of the s						VEG	
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Formaldehyde		,							
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 8088-A1 0.0352 0.3 11.7% 0.63% 14 Formaldehyde 4 8088-B1 0.0428 0.3 11.3% 0.63% 14 Formaldehyde 8 8088-C1 0.0428 0.3 14.3% 0.63% 14 Formaldehyde 10 8088-C1 0.0018 0.3 0.61% YES 0.63% 14 Formaldehyde 10 8088-C1 0.0018 0.3 0.61% YES 0.63% 14 Formaldehyde 12 8088-F1 0.0018 0.3 0.61% YES 0.63% 14 Formaldehyde 12 8088-F1 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8088-G1 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 15 8068-F1 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H1 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H1 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 14 8088-G2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 14 8088-G2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-H2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 10 8068-F2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 10 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 10 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 14 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.63% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-F2 0.0018 0.3 0.60% YES 0.005% 15 Acetaldehyde 17 Formaldehyde 18 8068-F2 0.0018 0.3 0.60% YES 0.005% 15 Acetaldehyde 18 8068-F2 0.0012 25 0.005% YES									
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14 Formaldehyde 14 8068-91 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 16 8068-11 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 4 8068-82 0.0018 0.3 0.58% YES 0.63% 14 Formaldehyde 6 8068-02 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 8 8068-02 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 10 8068-02 0.0019 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-02 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-02 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-02 0.0018 0.3 0.60% YES 0.63%								YES	
14 Formaldehyde 16 8068-H2 0.0018 0.3 0.69% YES 0.63% 14 Formaldehyde 4 8068-B2 0.0018 0.3 0.59% YES 0.63% 14 Formaldehyde 6 8068-C2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 10 8068-C2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 10 8068-C2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 12 8068-C2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-C2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-C2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 7837-E1 0.0018 0.3 0.60% YES 0.63%	14	And the second for the property of the second	14	8068-G1	0.0018				
14 Formaldehyde 2 8068-82 0.0018 0.3 0.59% 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 0.62% YES 0.63% 14 Formaldehyde 10 8068-D2 0.0019 0.3 0.62% YES 0.63% 14 Formaldehyde 12 8068-D2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 14 8068-D2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-D2 0.0018 0.3 0.60% YES 0.63% 14 Formaldehyde 16 8068-D2 0.0018 0.3 0.60% YES 0.63% 15 Acetaldehyde 2 7837-A1 0.0084 0.3 0.59% 0.005% 15			16	8068-H1	0.0018				
Formaldehyde	14		2	8068-A2	0.0018	0.3	0.59%	YES	
Formaldehyde	14	Formaldehyde	4	8068-B2	0.0018	0.3	0.58%	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 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 10 7837-E1 0.0836 25 0.318% 0.005% 15 Acetaldehyde 10 7837-E1 0.0836 25 0.335% 0.005% 15 Acetaldehyde 14 7837-E1 0.0836 25 0.331% 0.005% 15 Acetaldehyde 16 7837-H1 0.0824	14	Formaldehyde	6	8068-C2	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 8088-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 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-F1 0.0861 25 0.318% 0.005% 15 Acetaldehyde 11 0.7837-F1 0.0861 25 0.318% 0.005% 15 Acetaldehyde 12 7837-F1 0.0861 25 0.318% 0.005% 15 Acetaldehyde 14 7837-G1 0.0796 25 0.318% 0.005% 15 Acetaldehyde 14 7837-G1 0.0754 25 0.310% 0.005% 15 Acetaldehyde 14 7837-G1 0.0754 25 0.301% 0.005% 15 Acetaldehyde 14 7837-G1 0.0754 25 0.301% 0.005% 15 Acetaldehyde 14 7837-G1 0.0754 25 0.301% 0.005% 15 Acetaldehyde 2 7837-A2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 4 7837-B2 0.0312 25 0.005% YES 0.005% 15 Acetaldehyde 4 7837-B2 0.0384 25 0.154% 0.005% 15 Acetaldehyde 8 7837-D2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 8 7837-D2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 8 7837-D2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 8 7837-D2 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 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.351% 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.351% 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.362% 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.362% 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.365% 0.005% 15 Acetaldehyde 16 8068-E1 0.0935 25 0.351% 0.005% 15 Acetaldehyde 16 8068-E2 0.0013 25 0.0	14	Formaldehyde	8	8068-D2	0.0019	0.3	0.63%	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 0.395% 0.005% 15 Acetaldehyde 4 7837-C1 0.1007 25 0.403% 0.005% 15 Acetaldehyde 6 7837-C1 0.1007 25 0.403% 0.005% 15 Acetaldehyde 10 7837-C1 0.0065 25 0.318% 0.005% 15 Acetaldehyde 10 7837-E1 0.0836 25 0.335% 0.005% 15 Acetaldehyde 14 7837-F1 0.0836 25 0.330% 0.005% 15 Acetaldehyde 16 7837-F1 0.0824 25 0.330% 0.005% 15 Acetaldehyde 16 7837-A2 0.0012 25	14	Formaldehyde	10	8068-E2	0.0019	0.3	0.62%	YES	0.63%
14 Formaldehyde	14	Formaldehyde	12	8068-F2	0.0018	0.3	0.60%	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-C1 0.1007 25 0.403% 0.005% 15 Acetaldehyde 10 7837-E1 0.0836 25 0.318% 0.005% 15 Acetaldehyde 110 7837-F1 0.0836 25 0.344% 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 0.301% 0.005% 15 Acetaldehyde 16 7837-H1 0.0824 25 0.301% 0.005% 15 Acetaldehyde 2 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 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 10 7837-E2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 10 7837-E2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 10 7837-E2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 14 7837-G2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 14 7837-G2 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 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 7837-H2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 16 8068-B1 0.0938 25 0.374% 0.005% 15 Acetaldehyde 18 8068-B1 0.0938 25 0.374% 0.005% 15 Acetaldehyde 18 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 18 8068-B1 0.0958 25 0.374% 0.005% 15 Acetaldehyde 18 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 14 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B1 0.0957 25 0.391% 0.005% 15 Acetaldehyde 16 8068-B2 0.0013 25 0.005% YES 0.	14	Formaldehyde	14	8068-G2	0.0018	0.3	0.60%	YES	0.63%
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 10 7837-E1 0.0836 25 0.318% 0.005% 15 Acetaldehyde 12 7837-F1 0.0861 25 0.344% 0.005% 15 Acetaldehyde 14 7837-F1 0.0861 25 0.344% 0.005% 15 Acetaldehyde 16 7837-H1 0.0861 25 0.330% 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 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 8 7837-D2 0.0012 25	14	Formaldehyde	16	8068-H2	0.0018	0.3	0.59%	YES	0.63%
15 Acetaldehyde	15	Acetaldehyde				25	0.392%		0.005%
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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 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 10 7837-E2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde 14 7837-G2 0.0012 25 0.005% YES 0.005% 15 Acetaldehyde	15	Acetaldehyde					0.318%		0.005%
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OPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DI (%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%
		10	7837-E2	0.0002				
16	Butanal	12	7837-E2	0.0002	25	0.001%	YES	0.001%
16	Butanal	14	7837-F2 7837-G2		25	0.001%	YES	0.001%
16	Butanal			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%
		12	8068-E2	0.0002				
16	Butanal	14			25	0.001%	YES	0.001%
16	Butanal	16	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		12	7837-F2	0.00002	0.001	2.3%	YES	3.6%
	Furan	14	7037-12	0.00002	0.001	2.570	153	
19	Furan		7027 112	0.00003	0.004	2 20/	V55	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%
	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%
	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				e solventer at		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%
		4	7837-B2	0.00002	0.001	2.5%	YES	3.7%
22	2-Methylfuran	6	7837-62 7837-C2	0.00002				
22	2-Methylfuran	8	7837-C2 7837-D2	0.00003	0.001	2.5%	YES	3.7%
22	2-Methylfuran	10	7837-D2 7837-E2		0.001	2.5%	YES	3.7%
22	2-Methylfuran			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			200 Aurola II		4	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-F1 7837-G1	0.00005	0.001		YES	
	2,5-Dimethylfuran	16	7837-G1 7837-H1	0.00005		5.0%		5.2%
23	and the same of th	2	7837-A2		0.001	4.9%	YES	5.2%
23	2,5-Dimethylfuran			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% 5.2%
23	2,5-Dimethylfuran	8	7837-D2	0.00003	0.001	3.5%	YES	

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-R1	0.00004	0.001	4.2%	YES	4.3%
27	2-Pentylfuran	6	7837-C1	0.00004	0.001	4.3%	YES	4.3%
27	2-Pentylfuran	8	7837-C1 7837-D1	0.00004	0.001			
27	2-Pentylfuran	10	7837-D1	0.00004	0.001	4.3%	YES	4.3%
27			7837-E1			4.3%	YES	4.3%
	2-Pentylfuran	12		0.00004	0.001	4.1%	YES	4.3%
27 27	2-Pentylfuran	14	7837-G1	0.00004	0.001	4.2%	YES	4.3%
	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	00.00.00	0.0000	2.000			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								

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	0.00003	0.001	2.4%	YES	3.7%
	2-Propylfuran	14	8068-G2	0.00002	0.001	2.4%	YES	3.7%
29								

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%

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%	1450	0.003%
35 35	Propanenitrile	2	7837-A2 7837-B2	0.00017	6.0 6.0	0.003%	YES	0.003%
35	Propanenitrile Propanenitrile	6	7837-B2 7837-C2	0.00017 0.00017	6.0	0.003%	YES	0.003%
35	Propanenitrile	8	7837-C2 7837-D2	0.00017	6.0	0.003% 0.003%	YES YES	0.003% 0.003%
35	Propanenitrile	10	7837-E2	0.00017	6.0	0.005%	163	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 35	Propanenitrile	10 12	8068-E2	0.00032	6.0	0.005%		0.003%
35	Propanenitrile Propanenitrile	14	8068-F2 8068-G2	0.00045 0.00128	6.0 6.0	0.008%		0.003%
35	Propanenitrile	16	8068-G2	0.00128	6.0	0.021%		0.003%
33	Тораненине	10	0000112	0.00433	0.0	0.077%		0.003%
36	Butanenitrile	2	7837-A1	0.00448	8.0	0.056%		0.002%
36	Butanenitrile Butanenitrile	4 6	7837-B1 7837-C1	0.00478	8.0	0.060%		0.002%
36 36	Butanenitrile	8	7837-C1 7837-D1	0.00466 0.00385	8.0 8.0	0.058%		0.002%
36	Butanenitrile	10	7837-E1	0.00341	8.0	0.048%		0.002%
36	Butanenitrile	12	7837-E1	0.00323	8.0	0.045%		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	7837-02 7837-C2	0.00013	6.0	0.002%		
37	Pentanenitrile	8	7837-C2 7837-D2	0.00013	6.0		YES	0.002%
						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%	123	0.002%
38	Hexanenitrile	10	7837-E1	0.01022	6.0	0.170%		0.002%
38	Hexanenitrile	12	7837-E1	0.00010	6.0	0.170%	YES	0.002%
38	Hexanenitrile	14	7837-G1	0.00015	6.0	0.002%	163	0.002%
38	Hexanenitrile	16	7837-G1 7837-H1	0.00019	6.0			
						0.003%	VEC	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%
		16	7837-H2	0.00010	6.0	0.002%	YES	

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	0.10%	YES	0.10%
42	Ethylamine	16	7837-G2 7837-H2	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	2	8068-A1	0.0044	5			
42	Ethylamine	4	8068-B1	0.0048	5	0.09%	YES	0.10%
42	Ethylamine	6	8068-C1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	8	8068-C1	0.0049	5	0.10%	YES	0.10%
		10			5	0.10%	YES	0.10%
42	Ethylamine		8068-E1	0.0048		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%
	N-Nitrosodimethylamine	4	7837-B2	0.00003	0.0003	11.0%	YES	11.2%

COPC#	\$10,000,000 \$ 1,000,00	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			
44	N-Nitrosodiethylamine	16	8068-H1	0.00002	0.0001	21.4%	YES YES	23.2% 23.2%
44	N-Nitrosodiethylamine	2	8068-A2	0.00002	0.0001			
44	N-Nitrosodiethylamine	4	8068-B2	0.00002	0.0001	22.3% 22.6%	YES	23.2%
44	N-Nitrosodiethylamine	6	8068-C2	0.00002	0.0001		YES	23.2%
44	N-Nitrosodiethylamine	8	8068-D2	0.00002	0.0001	22.9%	YES	23.2%
						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 7837-E2	0.00003	0.0003	8.6%	YES	8.9%
45 45	N-Nitrosomethylethylamine	10 12	7837-E2 7837-F2	0.00003	0.0003	8.5%	YES	8.9%
45	N-Nitrosomethylethylamine N-Nitrosomethylethylamine	14	7837-F2 7837-G2	0.00003	0.0003	8.5%	YES	8.9%
45	N-Nitrosomethylethylamine	16	7837-G2 7837-H2	0.00002	0.0003	8.2%	YES	8.9%
45	N-Nitrosomethylethylamine	2	8068-A1	0.00002	0.0003	8.1% 8.0%	YES YES	8.9% 8.9%
45	N-Nitrosomethylethylamine	4	8068-B1	0.00002	0.0003	14.7%	163	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 46	N-Nitrosomorpholine	8 10	7837-D2 7837-E2	0.00002	0.0006	3.3%	YES	3.4%
46	N-Nitrosomorpholine N-Nitrosomorpholine	12	7837-E2 7837-F2	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	14	7837-F2 7837-G2	0.00002	0.0006	3.2%	YES	3.4%
46	N-Nitrosomorpholine	16	7837-G2 7837-H2	0.00002	0.0006	3.1% 3.1%	YES	3.4% 3.4%
46	N-Nitrosomorpholine	2	8068-A1	0.00002	0.0006	100	163	
46	N-Nitrosomorpholine	4	8068-B1	0.00006	0.0006	9.5%		3.4% 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	0.00025	0.20	0.0770	123	0.078%
47	Tributyl phosphate	4	8068-B1	0.00014	0.20	0.07%	YES	0.078%
47	Tributyl phosphate	6	8068-C1	0.00014	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	0.08%	YES	0.078%
47	Tributyl phosphate	12	5000-L1	0.00014	0.20	0.0776	TES	0.078%
47	Tributyl phosphate	14						
47	Tributyl phosphate	16	8068-H1	0.00014	0.20	0.079/	VEC	0.078%
47	Tributyl phosphate	2	8068-A2	0.00014	0.20	0.07%	YES	0.078%
47	and a first order and a financial first annual section.	4	8068-B2	0.00014	0.20	0.07%	YES	0.078%
	Tributyl phosphate					0.07%	YES	0.078%
47 47	Tributyl phosphate	6	8068-C2 8068-D2	0.00014	0.20	0.07%	YES	0.078%
	Tributyl phosphate	8		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	0.0000		1.2570	123	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-C1	0.00010	0.007	1.43%	YES	1.51%
48	Dibutyl butylphosphonate	10	8068-E1	0.00011	0.007	1.41%	YES	1.51%
48	Dibutyl butylphosphonate	12	0000-E1	0.00010	0.007	1.4170	153	1.51%
48	Dibutyl butylphosphonate	14						1.51%
48	Dibutyl butylphosphonate	16	8068-H1	0.00009	0.007	1.35%	VEC	
48	Dibutyl butylphosphonate	2	8068-A2	0.00010	0.007		YES	1.51%
48	Dibutyl butylphosphonate	4	8068-A2 8068-B2	0.00010	0.007	1.36%	YES	1.51%
48	and the second of the second o	6	8068-B2 8068-C2	0.00010	0.007	1.36%	YES	1.51%
48	Dibutyl butylphosphonate	О	0008-CZ	0.00010	0.007	1.41%	YES	1.51%

AB Dibutyl butylphosphonate 8 8088-D2 0.00010 0.007 1.40% YES	COPC#	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL?	Approx. DL (%OEL)
AB	48	Dibutyl butylphosphonate	8	8068-D2	0.00010	0.007	1.40%	YES	1.51%
Dibuty buty phosphonate	48	Dibutyl butylphosphonate	10	8068-E2	0.00010	0.007	1.38%	YES	1.51%
Solitary buty phosphonate 16 8068-H2 0.00010 0.007 1.36% YES	48	and the second of the second o	12	8068-F2	0.00010	0.007	1.36%	YES	1.51%
Pyridine		Dibutyl butylphosphonate					1.36%	YES	1.51%
Pyridine	48	Dibutyl butylphosphonate	16	8068-H2	0.00010	0.007	1.36%	YES	1.51%
Pyridine	51	Pyridine	2	7837-A1	0.00152	1.0	0.152%		0.036%
Si	51	Pyridine	4	7837-B1	0.00217	1.0	0.217%		0.036%
Pyridine	51	Pyridine	6	7837-C1	0.00204	1.0			0.036%
Pyridine	51	Pyridine	8	7837-D1	0.00109	1.0	0.109%		0.036%
Pyridine	51	Pyridine	10	7837-E1	0.00173	1.0	0.173%		0.036%
Pyridine	51	Pyridine	12	7837-F1	0.00102	1.0	0.102%		0.036%
Pyridine	51	Pyridine	14	7837-G1	0.00115	1.0	0.115%		0.036%
51 Pyridine 4 7837-B2 0.00033 1.0 0.032% YES 51 Pyridine 6 7837-C2 0.00032 1.0 0.032% YES 51 Pyridine 10 7837-E2 0.00031 1.0 0.031% YES 51 Pyridine 12 7837-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 7837-F2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 16 8068-B1 0.0017 1.0 0.177% 51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 10 8068-E1 0.00124 1.0 0.159% 51 Pyridine 12 8068-F1	51	Pyridine	16	7837-H1	0.00126	1.0	0.126%		0.036%
51 Pyridine 6 7837-C2 0.00032 1.0 0.032% YES 51 Pyridine 8 7837-C2 0.00032 1.0 0.032% YES 51 Pyridine 10 7837-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 7837-F2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 2 8068-A1 0.00177 1.0 0.177% 51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 10 8068-C1 0.00224 1.0 0.224% 51 Pyridine 10 8068-F1 0.00159 1.0 0.165% 51 Pyridine 14 8068-F1 0.00159 <td>51</td> <td>Pyridine</td> <td>2</td> <td>7837-A2</td> <td>0.00032</td> <td>1.0</td> <td>0.032%</td> <td>YES</td> <td>0.036%</td>	51	Pyridine	2	7837-A2	0.00032	1.0	0.032%	YES	0.036%
51 Pyridine 8 7837-D2 0.00032 1.0 0.032% YES 51 Pyridine 10 7837-E2 0.00031 1.0 0.031% YES 51 Pyridine 14 7837-G2 0.00030 1.0 0.033% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 2 8068-A1 0.00177 1.0 0.177% 51 Pyridine 4 8068-B1 0.00240 1.0 0.240% 51 Pyridine 8 8068-D1 0.00224 1.0 0.224% 51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-H1 0.00159 1.0 0.165% 51 Pyridine 14 8068-H1 0.00165 1.0 <td>51</td> <td>Pyridine</td> <td>4</td> <td>7837-B2</td> <td>0.00033</td> <td>1.0</td> <td>0.033%</td> <td>YES</td> <td>0.036%</td>	51	Pyridine	4	7837-B2	0.00033	1.0	0.033%	YES	0.036%
51 Pyridine 10 7837-E2 0.00031 1.0 0.031% YES 51 Pyridine 12 7837-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 7837-F2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 4 8068-B1 0.00226 1.0 0.236% 51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 10 8068-B1 0.00124 1.0 0.244% 51 Pyridine 10 8068-B1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00155 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 16 8068-B2 0.00035 1.0<	51	Pyridine	6	7837-C2	0.00032	1.0	0.032%	YES	0.036%
51 Pyridine 12 7837-F2 0.00031 1.0 0.033% YES 51 Pyridine 14 7837-G2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 16 8868-B1 0.00236 1.0 0.177% 51 Pyridine 6 8068-B1 0.00236 1.0 0.240% 51 Pyridine 6 8068-B1 0.00224 1.0 0.224% 51 Pyridine 10 8068-B1 0.00159 1.0 0.159% 51 Pyridine 12 8068-B1 0.00159 1.0 0.159% 51 Pyridine 14 8068-B1 0.00159 1.0 0.159% 51 Pyridine 16 8068-B1 0.00159 1.0 0.165% 51 Pyridine 16 8068-B1 0.00159 1.0 0.032% Y	51	Pyridine	8	7837-D2	0.00032	1.0	0.032%	YES	0.036%
51 Pyridine 14 7837-G2 0.00030 1.0 0.030% YES 51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 2 8068-A1 0.00177 1.0 0.177% 51 Pyridine 4 8068-B1 0.00236 1.0 0.236% 51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 10 8068-B1 0.00129 1.0 0.159% 51 Pyridine 12 8068-B1 0.00159 1.0 0.159% 51 Pyridine 12 8068-B1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-D2 0.00035 1.0 0.035% YES 51 Pyridine 4 8068-D2 0.00034 1.0 0.034%<	51	Pyridine	10	7837-E2	0.00031	1.0	0.031%	YES	0.036%
51 Pyridine 16 7837-H2 0.00030 1.0 0.030% YES 51 Pyridine 2 8068-A1 0.00177 1.0 0.177% 51 Pyridine 4 8068-B1 0.00240 1.0 0.240% 51 Pyridine 8 8068-D1 0.00244 1.0 0.224% 51 Pyridine 10 808-B-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-F1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 16 8068-B2 0.00030 1.0 0.030% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.034% YES 51 Pyridine 8 8068-D2 0.00034 1.0 0.034%	51	Pyridine	12	7837-F2	0.00031	1.0	0.031%	YES	0.036%
51 Pyridine 2 8068-A1 0.00177 1.0 0.177% 51 Pyridine 4 8068-B1 0.00236 1.0 0.236% 51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-F1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 16 8068-H1 0.00032 1.0 0.030% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.035% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.036%<	51	Pyridine	14	7837-G2	0.00030	1.0	0.030%	YES	0.036%
51 Pyridine 4 8068-B1 0.00236 1.0 0.236% 51 Pyridine 6 8068-C1 0.00224 1.0 0.224% 51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-E1 0.00159 1.0 0.124% 51 Pyridine 14 8068-B1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-R2 0.00030 1.0 0.030% YES 51 Pyridine 6 8068-B2 0.00036 1.0 0.035% YES 51 Pyridine 8 8068-D2 0.00036 1.0 0.036% YES 51 Pyridine 10 8068-B2 0.00031 1.0 0.030%<	51	Pyridine	16	7837-H2	0.00030	1.0	0.030%	YES	0.036%
51 Pyridine 6 8068-C1 0.00240 1.0 0.240% 51 Pyridine 8 8068-D1 0.00224 1.0 0.224% 51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-G1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-G1 0.0032 1.0 0.032% YES 51 Pyridine 2 8068-B2 0.00030 1.0 0.030% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.035% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.035% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00030 1.0	51	Pyridine	2	8068-A1	0.00177	1.0	0.177%		0.036%
51 Pyridine 8 8068-D1 0.00224 1.0 0.24% 51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-F1 0.00165 1.0 0.165% 51 Pyridine 14 8068-G1 0.00165 1.0 0.032% YES 51 Pyridine 16 8068-R2 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-R2 0.00035 1.0 0.035% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.036% YES 51 Pyridine 8 8068-D2 0.00036 1.0 0.036% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.030% YES 51 Pyridine 14 8068-F2	51	Pyridine	4	8068-B1	0.00236	1.0	0.236%		0.036%
51 Pyridine 10 8068-E1 0.00159 1.0 0.159% 51 Pyridine 12 8068-F1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-A2 0.00035 1.0 0.035% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.034% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 10 8068-C2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00030 1.0 0.030% YES 51 Pyridine 14 8068-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 8068-F2	51	Pyridine	6	8068-C1	0.00240	1.0	0.240%		0.036%
51 Pyridine 12 8068-F1 0.00124 1.0 0.124% 51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-R2 0.00035 1.0 0.035% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 8 8068-D2 0.00036 1.0 0.034% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.033% YES 51 Pyridine 14 8068-F2 0.00031 1.0 0.033% YES 51 Pyridine 16	51	Pyridine	8	8068-D1	0.00224	1.0	0.224%		0.036%
51 Pyridine 14 8068-G1 0.00165 1.0 0.165% 51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-R2 0.00030 1.0 0.035% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.034% YES 51 Pyridine 6 8068-C2 0.00036 1.0 0.034% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00030 1.0 0.033% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00031 1.0 0.038% YES 52 2,4-Dimethylpyrid	51	Pyridine	10	8068-E1	0.00159	1.0	0.159%		0.036%
51 Pyridine 16 8068-H1 0.00032 1.0 0.032% YES 51 Pyridine 2 8068-A2 0.00030 1.0 0.030% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.034% YES 51 Pyridine 6 8068-C2 0.00036 1.0 0.034% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.033% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.033% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00031 1.0 0.038% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 <td>51</td> <td>Pyridine</td> <td></td> <td>8068-F1</td> <td>0.00124</td> <td>1.0</td> <td>0.124%</td> <td></td> <td>0.036%</td>	51	Pyridine		8068-F1	0.00124	1.0	0.124%		0.036%
51 Pyridine 2 8068-A2 0.00030 1.0 0.030% YES 51 Pyridine 4 8068-B2 0.00035 1.0 0.035% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 10 8068-C2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.033% YES 51 Pyridine 14 8068-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 8068-F2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.038% YES 51 Pyridine 2 7837-A1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 2.2,4-Dimethylpyridine <td>51</td> <td>Pyridine</td> <td>14</td> <td>8068-G1</td> <td>0.00165</td> <td>1.0</td> <td>0.165%</td> <td></td> <td>0.036%</td>	51	Pyridine	14	8068-G1	0.00165	1.0	0.165%		0.036%
51 Pyridine 4 8068-B2 0.00035 1.0 0.035% YES 51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 8 8068-D2 0.00033 1.0 0.033% YES 51 Pyridine 10 8068-E2 0.00030 1.0 0.033% YES 51 Pyridine 12 8068-E2 0.00031 1.0 0.033% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.085% 51 Pyridine 2 7837-A1 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52	51	Pyridine		8068-H1	0.00032	1.0	0.032%	YES	0.036%
51 Pyridine 6 8068-C2 0.00034 1.0 0.034% YES 51 Pyridine 8 8068-D2 0.00036 1.0 0.036% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.031% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.031% YES 51 Pyridine 2 7837-A1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES		Pyridine		8068-A2	0.00030		0.030%	YES	0.036%
51 Pyridine 8 8068-D2 0.00036 1.0 0.036% YES 51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00031 1.0 0.030% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.038% YES 51 Pyridine 2 7837-A1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00022 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES		Pyridine		8068-B2	0.00035		0.035%	YES	0.036%
51 Pyridine 10 8068-E2 0.00033 1.0 0.033% YES 51 Pyridine 12 8068-F2 0.00030 1.0 0.030% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.031% YES 51 Pyridine 2 7837-A1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.041% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% <							0.034%	YES	0.036%
51 Pyridine 12 8068-F2 0.00030 1.0 0.030% YES 51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.039% YES 52 2,4-Dimethylpyridine 2 7837-A1 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.043% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-A2 0.00021 0.5 <		and the second s					0.036%	YES	0.036%
51 Pyridine 14 8068-G2 0.00031 1.0 0.031% YES 51 Pyridine 16 8068-H2 0.00085 1.0 0.085% 52 2,4-Dimethylpyridine 2 7837-A1 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.041% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038%							0.033%	YES	0.036%
51 Pyridine 16 8068-H2 0.00085 1.0 0.085% 52 2,4-Dimethylpyridine 2 7837-A1 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.043% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-B2 0.00021 0.5		The second secon							0.036%
52 2,4-Dimethylpyridine 2 7837-A1 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.043% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>0.031%</td> <td>YES</td> <td>0.036%</td>							0.031%	YES	0.036%
52 2,4-Dimethylpyridine 4 7837-B1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.043% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine <	51	Pyridine	16	8068-H2	0.00085	1.0	0.085%		0.036%
52 2,4-Dimethylpyridine 6 7837-C1 0.00022 0.5 0.043% YES 52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020<	52	2,4-Dimethylpyridine	2	7837-A1	0.00019	0.5	0.039%	YES	0.046%
52 2,4-Dimethylpyridine 8 7837-D1 0.00020 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020	52	2,4-Dimethylpyridine	4	7837-B1	0.00019	0.5	0.038%	YES	0.046%
52 2,4-Dimethylpyridine 10 7837-E1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020	52	2,4-Dimethylpyridine	6	7837-C1	0.00022	0.5	0.043%	YES	0.046%
52 2,4-Dimethylpyridine 12 7837-F1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-H2 0.00019	52	2,4-Dimethylpyridine	8	7837-D1	0.00020	0.5	0.041%	YES	0.046%
52 2,4-Dimethylpyridine 14 7837-G1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-H2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019	52	2,4-Dimethylpyridine	10	7837-E1	0.00019	0.5	0.038%	YES	0.046%
52 2,4-Dimethylpyridine 16 7837-H1 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine	52		12	7837-F1	0.00019		0.038%	YES	0.046%
52 2,4-Dimethylpyridine 2 7837-A2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 </td <td>52</td> <td>2,4-Dimethylpyridine</td> <td>14</td> <td>7837-G1</td> <td>0.00019</td> <td>0.5</td> <td>0.038%</td> <td>YES</td> <td>0.046%</td>	52	2,4-Dimethylpyridine	14	7837-G1	0.00019	0.5	0.038%	YES	0.046%
52 2,4-Dimethylpyridine 4 7837-B2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine	16	7837-H1	0.00019	0.5	0.038%	YES	0.046%
52 2,4-Dimethylpyridine 6 7837-C2 0.00021 0.5 0.042% YES 52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine	2	7837-A2	0.00021	0.5	0.041%	YES	0.046%
52 2,4-Dimethylpyridine 8 7837-D2 0.00021 0.5 0.041% YES 52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine	4	7837-B2	0.00021	0.5	0.042%	YES	0.046%
52 2,4-Dimethylpyridine 10 7837-E2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine	6	7837-C2	0.00021	0.5	0.042%	YES	0.046%
52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine	8	7837-D2	0.00021	0.5	0.041%	YES	0.046%
52 2,4-Dimethylpyridine 12 7837-F2 0.00020 0.5 0.040% YES 52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES	52	2,4-Dimethylpyridine		7837-E2	0.00020	0.5	0.040%	YES	0.046%
52 2,4-Dimethylpyridine 14 7837-G2 0.00019 0.5 0.039% YES 52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES		2,4-Dimethylpyridine		7837-F2	0.00020		0.040%		0.046%
52 2,4-Dimethylpyridine 16 7837-H2 0.00019 0.5 0.038% YES 52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES		and the second second second							0.046%
52 2,4-Dimethylpyridine 2 8068-A1 0.00020 0.5 0.039% YES 52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES		0							0.046%
52 2,4-Dimethylpyridine 4 8068-B1 0.00020 0.5 0.040% YES		TOTAL TO SENSE TO SENSE OF THE SECOND SENSE.							0.046%
		and to come the second							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		THE RESIDENCE THE TAX PROPERTY.							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.

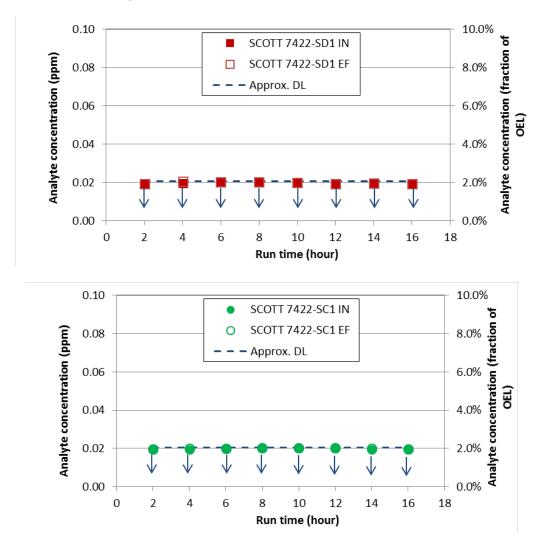


Figure E.1. Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL).

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

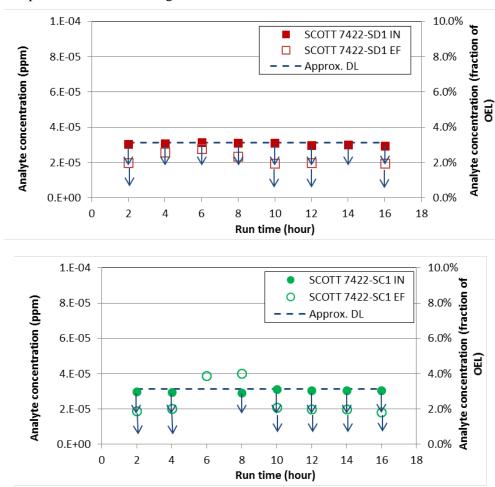


Figure E.2. Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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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-Methyfuran (see Figure E.3) – The DL for 2-methylfuran corresponds to \sim 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.

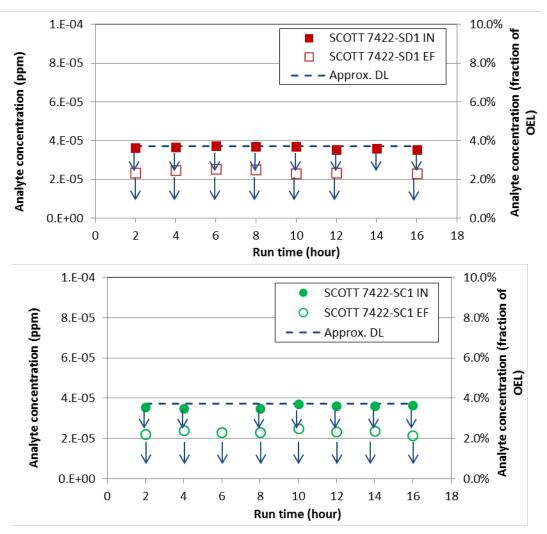


Figure E.3. Plot of Measured 2-Methylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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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.

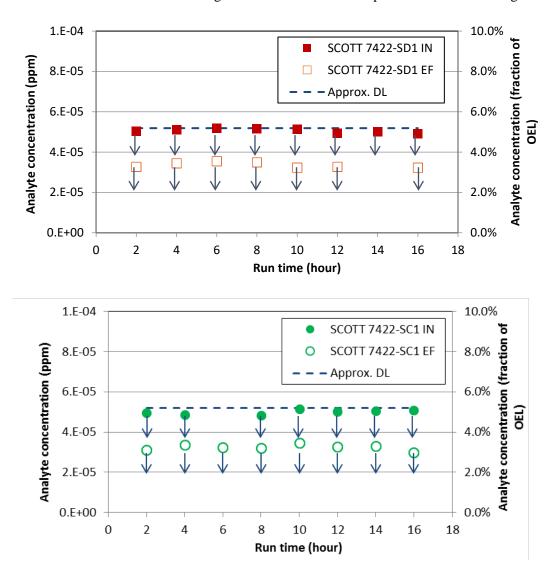


Figure E.4. Plot of Measured 2,5-Dimethylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.

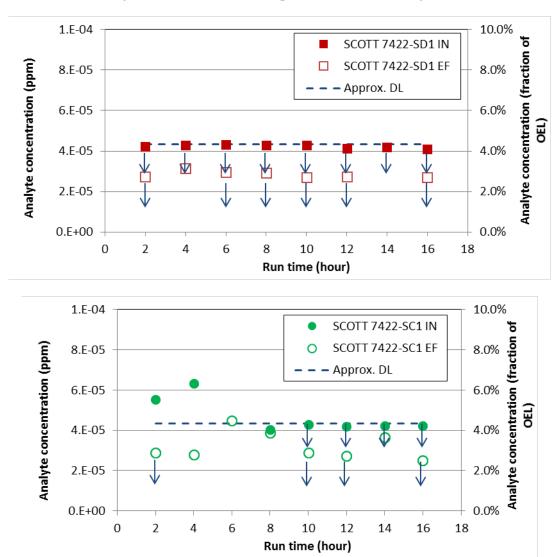
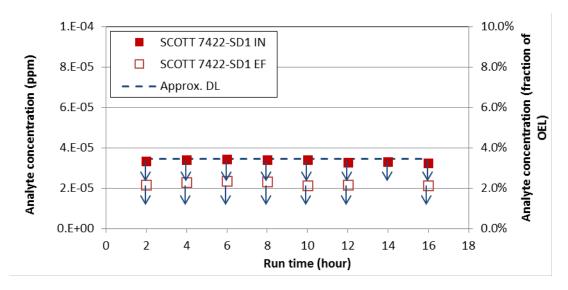


Figure E.5. Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.



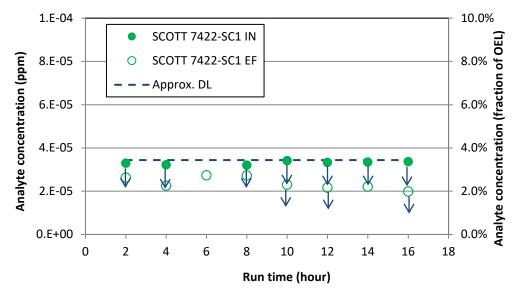


Figure E.6. Plot of Measured 2-Heptylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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.

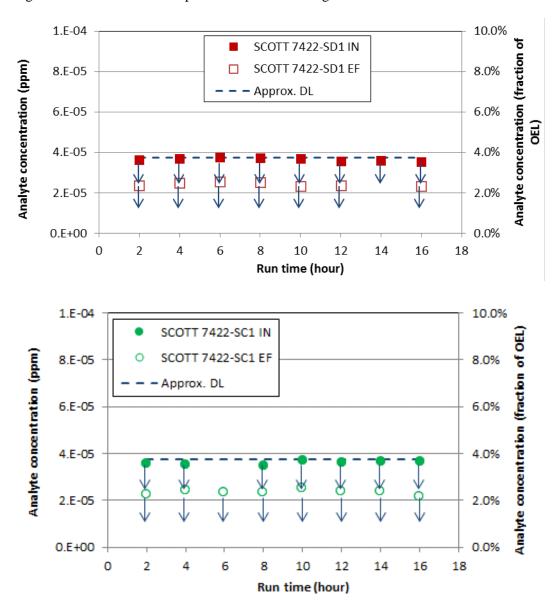


Figure E.7. Plot of Measured 2-Propylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

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

F.1

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.

significant figures.

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²⁵ Hoppe, EW, LA Mahoney, J Cole, and KS Rohlfing. 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

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

							Historic	Historical Measurements ¹	nents ¹			Measuremer	Measurements in this study	dy
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%0EL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL ¹³ (%OEL)
Inorg	Inorganic													
1	Ammonia	7664-41-7	-28	Poling et al., 2007²	25 ppm	3	93.9	31.6*	376%	126%*	801%	713%	%292	2.56% (RL)
2	Nitrous Oxide	10024-97-2	-127	Poling et al., 2007	50 ppm	1	≺RL	<rl< td=""><td>-RL</td><td><rl< td=""><td></td><td>Not M</td><td>Not Measured</td><td></td></rl<></td></rl<>	-RL	<rl< td=""><td></td><td>Not M</td><td>Not Measured</td><td></td></rl<>		Not M	Not Measured	
3	Mercury	7439-97-6	674	Poling et al., 2007	0.025 mg/m ³	3	900.0	0.00311	24%	12%	24.3%	18.7%	16.3%	7.33% (RL)
Hydr	Hydrocarbons													
4	1,3-Butadiene	106-99-0	24	Poling et al., 2007	1 ppm	5	≺RL	<rl< td=""><td>≺RL</td><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>2.05% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	≺RL	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>2.05% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>2.05% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>2.05% (RL)</td></rl<></td></rl<>	<rl< td=""><td>2.05% (RL)</td></rl<>	2.05% (RL)
2	Benzene	71-43-2	176	Poling et al., 2007	0.5 ppm	3	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.19%</td><td>0.15%</td><td>0.090%</td><td>0.021%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.19%</td><td>0.15%</td><td>0.090%</td><td>0.021%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.19%</td><td>0.15%</td><td>0.090%</td><td>0.021%</td></rl<></td></rl<>	<rl< td=""><td>0.19%</td><td>0.15%</td><td>0.090%</td><td>0.021%</td></rl<>	0.19%	0.15%	0.090%	0.021%
9	Biphenyl	92-52-4	491	Poling et al., 2007	0.2 ppm	2	<rl< td=""><td><rl< td=""><td>≺RL</td><td><rl< td=""><td>TO></td><td>1U></td><td>7d></td><td>%960:0</td></rl<></td></rl<></td></rl<>	<rl< td=""><td>≺RL</td><td><rl< td=""><td>TO></td><td>1U></td><td>7d></td><td>%960:0</td></rl<></td></rl<>	≺RL	<rl< td=""><td>TO></td><td>1U></td><td>7d></td><td>%960:0</td></rl<>	TO>	1U>	7d>	%960:0
Alcohols	hols													
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%
∞	Methanol	67-56-1	148	Poling et al., 2007	200 ppm	0	n/a	n/a	n/a	n/a		Not Me	Not Measured	
Ketones	nes													
6	2-Hexanone	591-78-6	262	NIOSH	5 ppm	3	≺RL	0.00373*	<rl< td=""><td>0.07%*</td><td>0.062%</td><td>0.041%</td><td>0.028%</td><td>0.002%</td></rl<>	0.07%*	0.062%	0.041%	0.028%	0.002%
10	3-Methyl-3-butene-2-one	814-78-8	208	CRC Handbook 1989 ⁴	0.02 ppm	0	n/a	n/a	n/a	n/a		Not Dete	Not Detected - TIC ¹²	
11	4-Methyl-2-hexanone	105-42-0	282	Predicted ACD/Labs ⁵	0.5 ppm	1	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.021%</td><td>0.015%</td><td>7Q></td><td>0.017%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.021%</td><td>0.015%</td><td>7Q></td><td>0.017%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.021%</td><td>0.015%</td><td>7Q></td><td>0.017%</td></rl<></td></rl<>	<rl< td=""><td>0.021%</td><td>0.015%</td><td>7Q></td><td>0.017%</td></rl<>	0.021%	0.015%	7Q>	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 Det	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%
Alde	Aldehydes													
14	Formaldehyde	50-00-0	9-	NIOSH	0.3 ppm	5	<rl< td=""><td>0.0353*</td><td><rl< td=""><td>12%*</td><td>14.4%</td><td>4.91%</td><td>0.67%</td><td>0.63% (RL)</td></rl<></td></rl<>	0.0353*	<rl< td=""><td>12%*</td><td>14.4%</td><td>4.91%</td><td>0.67%</td><td>0.63% (RL)</td></rl<>	12%*	14.4%	4.91%	0.67%	0.63% (RL)
15	Acetaldehyde	75-07-0	69	NIOSH	25 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.42%</td><td>0.35%</td><td>0.32%</td><td>0.005% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.42%</td><td>0.35%</td><td>0.32%</td><td>0.005% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.42%</td><td>0.35%</td><td>0.32%</td><td>0.005% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.42%</td><td>0.35%</td><td>0.32%</td><td>0.005% (RL)</td></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< td=""><td>0.22%*</td><td>0.017%</td><td>0.010%</td><td>0.005%</td><td>0.001%</td></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 Det	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 Det	Not Detected - TIC	

Table F.1. (continued)

							Historic	Historical Measurements ¹	nents1			Measureme	Measurements in this study	dy
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%0EL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL ¹³ (%OEL)
Furans	Su													
19	Furan	110-00-9	88	Poling et al., 2007	1 ppb	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>14.7%</td><td>4.96%</td><td>6.20%</td><td>3.61%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>14.7%</td><td>4.96%</td><td>6.20%</td><td>3.61%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>14.7%</td><td>4.96%</td><td>6.20%</td><td>3.61%</td></rl<></td></rl<>	<rl< td=""><td>14.7%</td><td>4.96%</td><td>6.20%</td><td>3.61%</td></rl<>	14.7%	4.96%	6.20%	3.61%
20	2,3-Dihydrofuran	1191-99-7	130	Alfa Aesar ⁸	1 ppb	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>43.6%</td><td>16.4%</td><td>10.4%</td><td>2.14%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>43.6%</td><td>16.4%</td><td>10.4%</td><td>2.14%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>43.6%</td><td>16.4%</td><td>10.4%</td><td>2.14%</td></rl<></td></rl<>	<rl< td=""><td>43.6%</td><td>16.4%</td><td>10.4%</td><td>2.14%</td></rl<>	43.6%	16.4%	10.4%	2.14%
21	2,5-Dihydrofuran	1708-29-8	152	Aldrich ⁹	1 ppb	5	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>4.00%</td><td>3.13%</td></dl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>4.00%</td><td>3.13%</td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>4.00%</td><td>3.13%</td></dl<></td></rl<></td></rl<>	<rl< td=""><td>1Q></td><td><dl< td=""><td>4.00%</td><td>3.13%</td></dl<></td></rl<>	1Q>	<dl< td=""><td>4.00%</td><td>3.13%</td></dl<>	4.00%	3.13%
22	2-Methylfuran	534-22-5	147	Oxford safety data	1 ppb	4	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>1O></td><td>3.72%</td></dl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>1O></td><td>3.72%</td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>1Q></td><td><dl< td=""><td>1O></td><td>3.72%</td></dl<></td></rl<></td></rl<>	<rl< td=""><td>1Q></td><td><dl< td=""><td>1O></td><td>3.72%</td></dl<></td></rl<>	1Q>	<dl< td=""><td>1O></td><td>3.72%</td></dl<>	1O>	3.72%
23	2,5-Dimethylfuran	625-86-5	199	Alfa Aesar	1 ppb	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>7Q></td><td><dl< td=""><td>-OL</td><td>5.19%</td></dl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>7Q></td><td><dl< td=""><td>-OL</td><td>5.19%</td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>7Q></td><td><dl< td=""><td>-OL</td><td>5.19%</td></dl<></td></rl<></td></rl<>	<rl< td=""><td>7Q></td><td><dl< td=""><td>-OL</td><td>5.19%</td></dl<></td></rl<>	7Q>	<dl< td=""><td>-OL</td><td>5.19%</td></dl<>	-OL	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 Det	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 Det	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	e/u	e/u		Not Det	Not Detected - TIC	
27	2-Pentylfuran	3777-69-3	333	Alfa Aesar	1 ppb	2 5	<rl 2.74</rl 	<rl 1.6</rl 	<rl 274%</rl 	<rl 160%</rl 	6.32%	4.44%	4.49%	4.33%
28	2-Heptylfuran	3777-71-7	410	Alfa Aesar	1 ppb	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>TQ></td><td>TO></td><td>2.73%</td><td>3.44%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>TQ></td><td>TO></td><td>2.73%</td><td>3.44%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>TQ></td><td>TO></td><td>2.73%</td><td>3.44%</td></rl<></td></rl<>	<rl< td=""><td>TQ></td><td>TO></td><td>2.73%</td><td>3.44%</td></rl<>	TQ>	TO>	2.73%	3.44%
29	2-Propylfuran	4229-91-8	231	Alfa Aesar	1 ppb	2	<rl< td=""><td><rl< td=""><td>-RL</td><td><rl< td=""><td>TQ></td><td>TO></td><td>1Q></td><td>3.74%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td>-RL</td><td><rl< td=""><td>TQ></td><td>TO></td><td>1Q></td><td>3.74%</td></rl<></td></rl<>	-RL	<rl< td=""><td>TQ></td><td>TO></td><td>1Q></td><td>3.74%</td></rl<>	TQ>	TO>	1Q>	3.74%
30	2-Octylfuran	4179-38-8	452	Predicted ACD/Labs	1 ppb	0	n/a	e/u	e/u	e/u		Not Det	Not Detected - TIC	
31	2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	909	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a		Not Det	Not Detected - TIC	
32	2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not available	Not available	1 ppb	0	n/a	n/a	e/u	n/a		Not Det	Not Detected - TIC	
Phth	Phthalates													
33	Diethylphthalate	84-66-2	563	NIOSH	5 mg/m ³	2	<rl< td=""><td><rl< td=""><td>≺RL</td><td><rl< td=""><td>TO></td><td><dl< td=""><td>10></td><td>0.042%</td></dl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td>≺RL</td><td><rl< td=""><td>TO></td><td><dl< td=""><td>10></td><td>0.042%</td></dl<></td></rl<></td></rl<>	≺RL	<rl< td=""><td>TO></td><td><dl< td=""><td>10></td><td>0.042%</td></dl<></td></rl<>	TO>	<dl< td=""><td>10></td><td>0.042%</td></dl<>	10>	0.042%

Table F.1. (continued)

							Historic	Historical Measurements ¹	nents ¹			Measuremer	Measurements in this study	dy
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	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)
Nitriles	sə													
34	Acetonitrile	75-05-8	179	NIOSH	20 ppm	3	<rl< th=""><th>0.261*</th><th><rl< th=""><th>1.3%*</th><th>2.55%</th><th>0.70%</th><th>20.8%</th><th>0.002%</th></rl<></th></rl<>	0.261*	<rl< th=""><th>1.3%*</th><th>2.55%</th><th>0.70%</th><th>20.8%</th><th>0.002%</th></rl<>	1.3%*	2.55%	0.70%	20.8%	0.002%
35	Propanenitrile	107-12-0	207	NIOSH	wdd 9	3	0.004	0.00269	%20.0	0.04%	0.16%	0.12%	%//0.0	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	mdd 9	3	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.023%</td><td>0.016%</td><td>%200.0</td><td>0.002%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.023%</td><td>0.016%</td><td>%200.0</td><td>0.002%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.023%</td><td>0.016%</td><td>%200.0</td><td>0.002%</td></rl<></td></rl<>	<rl< td=""><td>0.023%</td><td>0.016%</td><td>%200.0</td><td>0.002%</td></rl<>	0.023%	0.016%	%200.0	0.002%
38	Hexanenitrile	628-73-9	328	Predicted ACD/Labs	mdd 9	3	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.17%</td><td>0.039%</td><td>0.002%</td><td>0.002%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.17%</td><td>0.039%</td><td>0.002%</td><td>0.002%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.17%</td><td>0.039%</td><td>0.002%</td><td>0.002%</td></rl<></td></rl<>	<rl< td=""><td>0.17%</td><td>0.039%</td><td>0.002%</td><td>0.002%</td></rl<>	0.17%	0.039%	0.002%	0.002%
39	Heptanenitrile	629-08-3	368	Alfa Aesar	mdd 9	0	n/a	n/a	e/u	n/a		Not Det	Not Detected - TIC	
40	2-Methylene butanenitrile	1647-11-6	Not available	Not available	0.3 ppm	0	n/a	e/u	e/u	n/a		Not Det	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 Det	Not Detected - TIC	
Amines	ies													
45	Ethylamine	75-04-7	62	Poling et al., 2007	2 ppm	2	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th>0.098% (RL)</th></rl<></th></rl<>	<rl< th=""><th>0.098% (RL)</th></rl<>	0.098% (RL)
Nitro	Nitrosamines													
43	N-Nitrosodimethylamine	62-75-9	306	NIOSH	0.3 ppb	3	1.6	0.567*	233%	189%*	932%	642%	644%	11.2% (RL)
44	N-Nitrosodiethylamine	55-18-5	351	Oxford safety data	0.1 ppb	3	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th>23.2% (RL)</th></rl<></th></rl<>	<rl< th=""><th>23.2% (RL)</th></rl<>	23.2% (RL)
45	N-Nitrosomethylethylamine	10595-95-6	310	Predicted ACD/Labs	0.3 ppb	3	<rl< th=""><th><rl< th=""><th>-KRL</th><th><rl< th=""><th>15.5%</th><th>11.1%</th><th>8:95%</th><th>8.95% (RL)</th></rl<></th></rl<></th></rl<>	<rl< th=""><th>-KRL</th><th><rl< th=""><th>15.5%</th><th>11.1%</th><th>8:95%</th><th>8.95% (RL)</th></rl<></th></rl<>	-KRL	<rl< th=""><th>15.5%</th><th>11.1%</th><th>8:95%</th><th>8.95% (RL)</th></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< th=""><th><rl< th=""><th><rl< th=""><th><rl< th=""><th>14.4%</th><th>7.45%</th><th>7.85%</th><th>3.40% (RL)</th></rl<></th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th><rl< th=""><th>14.4%</th><th>7.45%</th><th>7.85%</th><th>3.40% (RL)</th></rl<></th></rl<></th></rl<>	<rl< th=""><th><rl< th=""><th>14.4%</th><th>7.45%</th><th>7.85%</th><th>3.40% (RL)</th></rl<></th></rl<>	<rl< th=""><th>14.4%</th><th>7.45%</th><th>7.85%</th><th>3.40% (RL)</th></rl<>	14.4%	7.45%	7.85%	3.40% (RL)
Orga	Organophospates													
47	Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.078%</td></rl<></td></rl<>	<rl< td=""><td>0.078%</td></rl<>	0.078%
48	Dibutyl butylphosphonate	78-46-6	602	Predicted ACD/Labs	0.007 ppm	2	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>1.51%</td></rl<></td></rl<>	<rl< td=""><td>1.51%</td></rl<>	1.51%
Halo	Halogenated													
49	Chlorinated Biphenyls	Varies	Varies	Varies	1 mg/m³	0	n/a	n/a	n/a	n/a		Not Det	Not Detected - TIC	
20	2-Fluoropropene	1184-60-7	-11	SynQuest ¹¹	0.1 ppm	1	<rl <<="" th=""><th>^RL</th><th><rl< th=""><th><rl< th=""><th></th><th>Not Det</th><th>Not Detected - TIC</th><th></th></rl<></th></rl<></th></rl>	^RL	<rl< th=""><th><rl< th=""><th></th><th>Not Det</th><th>Not Detected - TIC</th><th></th></rl<></th></rl<>	<rl< th=""><th></th><th>Not Det</th><th>Not Detected - TIC</th><th></th></rl<>		Not Det	Not Detected - TIC	

Table F.1. (continued)

							Historic	Historical Measurements*	ents*			Vleasuremen	Measurements in this study	y
	COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Number of Maximum Values Value	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet Max outlet (%OEL) (%OEL)	Max outlet (%OEL)	Approx. DL ¹³ (%OEL)
Pyridines	nes												+	
51	Pyridine	110-86-1	240	NIOSH	1 ppm	5	<rl< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>0.24%</td><td>0.16%</td><td>0.085%</td><td>0.036% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>0.24%</td><td>0.16%</td><td>0.085%</td><td>0.036% (RL)</td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>0.24%</td><td>0.16%</td><td>0.085%</td><td>0.036% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.24%</td><td>0.16%</td><td>0.085%</td><td>0.036% (RL)</td></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< td=""><td><rl< td=""><td><rl< td=""><td><rl< td=""><td>^RL</td><td><rl< td=""><td><rl< td=""><td>0.046% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td><rl< td=""><td>^RL</td><td><rl< td=""><td><rl< td=""><td>0.046% (RL)</td></rl<></td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td><rl< td=""><td>^RL</td><td><rl< td=""><td><rl< td=""><td>0.046% (RL)</td></rl<></td></rl<></td></rl<></td></rl<>	<rl< td=""><td>^RL</td><td><rl< td=""><td><rl< td=""><td>0.046% (RL)</td></rl<></td></rl<></td></rl<>	^RL	<rl< td=""><td><rl< td=""><td>0.046% (RL)</td></rl<></td></rl<>	<rl< td=""><td>0.046% (RL)</td></rl<>	0.046% (RL)
Organ	Organonitrites													
53	Methyl nitrite	624-91-9	10	Oxford safety data	0.1 ppm	0	n/a	n/a	n/a	n/a		Not Dete	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 Dete	Not Detected - TIC	
Organ	Organonitrates													
55	Butyl nitrate	928-45-0	276	Predicted ACD/Labs	2.5 ppm	0	n/a	n/a	n/a	n/a		Not Dete	Not Detected - TIC	
99	1,4-Butanediol, dinitrate	3457-91-8	499	Predicted ACD/Labs	0.05 ppm	0	n/a	n/a	n/a	n/a		Not Dete	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 Dete	Not Detected - TIC	
88	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 Dete	Not Detected - TIC	
socyc	socyanates													
29	Methyl Isocyanate	624-83-9	103	NIOSH	0.02 ppm	0	n/a	n/a	n/a	n/a		Not Dete	Not Detected - TIC	
Hist	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.	r database and	SWIH data	base; see text for links ar	nd dates of querie:	s. Values in its	alics include t	hose data plu	ıs data from t	he TWINS he	eadspace date	abase, all san	nples earlier t	han 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.

[&]quot;< 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.

[&]quot;n/a" indicates no historical data was found in the databases

Poling, B. E.; Prausnitz, J. M.; O'Connell, J. P. The Properties of Gases and Liquids. McGraw Hill, 2007.

NIOSH: National Institute of Occupational Safety and Health

CRC Handbook of Chemistry and Physics, CRC Press, 1989.

ACD/Labs software http://www.acdlabs.com/products/percepta/predictors.php

Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

Food and Agriculture Organization of the United Nations

Alfa Aesar: https://www.alfa.com/

OSHA: Occupational Safety and Health Administration Aldrich: https://www.sigmaaldrich.com/

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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