



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

July 2020

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Richland, Washington 99352

Executive Summary

Washington River Protection Solutions conducted tests on two types of chemical cartridges for use in air purifying respirators to determine the period of time that the cartridges would provide adequate performance¹ for air purifying respirators used to protect workers when exposed to a mixture of Chemicals of Potential Concern (COPCs) from vapors exiting the exhausters at the Hanford AN tank farms. The Occupational Safety and Health Administration (OSHA) identifies cartridge testing as a valid approach for establishing cartridge change schedule.[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 30–October 2, 2016, on a slipstream from the AN Exhauster 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 the AN Exhauster, three COPCs, ammonia, N-nitrosodimethylamine (NDMA), and N-nitrosomethylethylamine, exceeded their corresponding Occupational Exposure Limits (OELs).² Four COPCs—mercury, 2,5-dihydrofuran, N-nitrosodiethylamine (NDEA), and N-nitrosomorpholine—reported one or more inlet concentration measurements >10% of their corresponding OELs, but <100%.³ All other COPC inlet and outlet measurements did not exceed 10% of their OELs.

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 >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 selection needed to provide the necessary performance for specific applications in Hanford tank farms.

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 Inlet concentrations for furan using the Carbotrap 300 TDU results were significantly higher than documented in this report (using the Tenax tube) although breakthrough was not observed on either cartridge. The inlet maximum concentrations using the Carbotrap 300 TDU methods were 84.7% of the OEL for the 7422-SD1 cartridge and 77.5% for the 7422-SC1 cartridge. Furans measured on the effluent were all below the detection limits (DL) indicating no breakthrough for either cartridge during the testing period. All inlet and effluent Carbotrap 300 TDU results for

2,5-dihydrofuran and 2-methylfuran were below DL. The re-evaluation of the furans 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU is discussed in Pacific Northwest National Laboratory (PNNL) technical report PNNL-26821 (Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington).

- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 130% of the OEL (32.5 ppm), which was significantly lower than the maximum historical measurement of 536% of its OEL from the AN Exhauster. For both cartridges, ammonia appeared to breakthrough above 10% of its OEL after 10 hours. The inlet ammonia concentrations were relatively consistent at the beginning of the campaign for both cartridges. However, a significant decrease in ammonia inlet concentrations was observed at the 12- and 14-hour measurements for the SCOTT 7422-SD1 cartridge, which could be due to analytical or flow measurement error.
- Cartridge inlet concentration measurements for NDMA reached 4589% of its OEL (13.7 ppb), which was significantly lower than maximum and average historical measurements from the AN Exhauster; that is 85667% and 8033% of the OEL, respectively. However, all outlet concentrations were less than the analytical reporting limit of 13% of the OEL, indicating no breakthrough for either cartridge during the testing period.
- Cartridge inlet concentrations for N-nitrosomethylethylamine reached 106% of its OEL (0.32 ppb), which was lower than maximum and average historical measurements from the exhauster of 285% and 125%, respectively. However, all outlet concentrations were less than the analytical reporting limit of ~10% of the OEL, indicating no breakthrough for either cartridge during the testing period.
- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant between 10% and 12% of the OEL, with two exceptions where the concentration decreased to less than the DL⁴ in one test and increased to a maximum of 16% of the OEL in the other test. Overall, inlet concentrations of mercury during cartridge testing were substantially lower than average and maximum historic AN Exhauster measurements of ~200% and 1800% of the OEL, respectively. Mercury outlet concentrations during this study were all below the DL, indicating no breakthrough for the testing period.
- Maximum NDEA inlet concentrations for both cartridges were observed during the first 6 hours of each test and ranged from 43% to 71% of the OEL. Inlet concentrations for the remainder of each test were less than the DL. All of the respirator outlet measurements were below the DL, indicating no breakthrough for either cartridge during the testing period.
- N-Nitrosomorpholine inlet concentrations reached a maximum of ~33% of the OEL early in each test, before decreasing at later sample times. All outlet concentrations were less than the DL, indicating no breakthrough for either cartridge during the testing period.
- The inlet concentration for 2,5-dihydrofuran⁵ reached a maximum of ~11% of the OEL in testing with the SCOTT 7422-SD1 cartridge. However, the majority of inlet measurements for both cartridges were at or near the analytical DL. All outlet concentrations for both cartridges were less than the DL, indicating no breakthrough for either cartridge during the testing period.

⁴ The term “detection limit” is used here to refer either to an analytical 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.

⁵ All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below DL. The re-evaluation of the furans 2,5-dihydrofuran and 2-methylfuran 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. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspaces and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington).

Based on the measurements taken for this study, ammonia appeared to breakthrough above 10% of its OEL after 10 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). Inlet concentrations of ammonia remained relatively constant with an average of 118% of the OEL (29.5 ppm) up through the 10-hour sample period. 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.

Historic concentrations from the AN Exhauster for a number of COPCs, including ammonia, mercury, and NDMA, were substantially higher than cartridge testing inlet concentrations and should be carefully considered. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of air purifying respirator applicability and an appropriate respirator cartridge change-out schedule for adequate worker protection.

Technical report PNNL-26821⁶ provides additional information on the use of the cartridge testing results for the first 28 cartridge tests with the manufacturers service life models.

⁶ Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington.

Revision History

Revision Number	Effective Date	Description of Change
0		Initial issue
1	July 2020	<p>This report has been revised to address external peer review comments on the Rev. A report and other test reports from 2016 cartridge testing. The principal changes include:</p> <ol style="list-style-type: none"> 1. Adding descriptive information to Appendices A, B, and C to provide additional clarity on the contents and methods applied. 2. A furans analytical methods review was conducted in 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 of the furan, 2,5-dihydrofuran, and 2-methylfuran results for the 2016 air purifying respirator cartridge testing have been re-evaluated and are documented in PNNL-26821.⁷ Therefore, values for furan, 2,5-dihydrofuran, and 2-methylfuran have not been updated in this revision of the report. <p>Inlet concentrations for furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 TDU results were significantly higher than documented in this report⁸. No breakthrough of these furan compounds was observed on either cartridge tested.</p>

⁷ See Appendix F of PNNL-26821 (Freeman CJ, J Liu, C Clayton, SK Nune, LA Mahoney, CL Bottenus, TM Brouns, MJ Minette, and P Humble. 2017. *Overview of 2016 Testing of Respirator Cartridge Performance on Multiple Hanford Tank Headspace and Exhausters*. PNNL-26821, Pacific Northwest National Laboratory, Richland, Washington).

⁸ Inlet concentrations for furan using the Carbotrap 300 TDU results were significantly higher than documented in this report although breakthrough was not observed on either cartridge. The inlet maximum using the Carbotrap 300 TDU method was 84.7% of the OEL for the 7422-SD1 cartridge and 77.5% for the 7422-SC1 cartridge. All furans measured on the effluent were below detection limits indicating no breakthrough for either cartridge during the testing period. All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below detection limits.

Acronyms and Abbreviations

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

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1.0 Introduction/Project Description

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

2.0 Regulatory Requirements

2.1 Background on Regulatory Requirements

OSHA Respiratory Protection Standard (29 CFR 1910.134) mandates/requires that employers provide protective equipment, including respirators, to their employees to protect them against potential exposure to contaminants at or above documented Occupational Exposure Limits (OEL) 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 (~30 pounds), back-mounted compressed air cylinder.[1]

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

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

- *Conduct experimental tests* – First, gather all available information about the nature of all contaminants present in the workplace. Obtain breathing rates of workers and estimate worst-case exposures. For most employers, this approach is the most time consuming, and resources needed to perform these tests may not be available. If an employer has the resources needed to pursue this approach, it is the most reliable method of estimating cartridge service life. Concentrations at different points in time are obtained using actual respirator cartridges exposed to actual or simulated gases to gather service-life information. A safety factor that includes the assumptions made, variable factors, or conditions needs to be applied to the service life and used in the respiratory protection program. This approach is commonly used in situations where mixtures of contaminants are present and can also be used to validate an existing cartridge change-out schedule.
- *Use the manufacture's recommendation* – Once information about airborne contaminants (including concentrations, temperature, and humidity) has been obtained, contact the manufacturer of the respirator to be used and provide all the information. Manufacturers should be able to provide the estimated service life of different cartridges for particular compounds. Manufacturers should also be able to provide the exact objective information they used to project the service life. Using the information obtained, service lives are proposed. This approach is not as reliable as conducting application-specific experiments, and manufacturers may not have all the information for workplace hazards and user factors. If any safety factor is applied considering all the variable factors, it must be clearly identified in the respiratory protection program. For complex mixtures such as those present in the 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. OSHA and NIOSH have worked over the years with researchers and industrial partners to develop mathematical models for predicting respirator cartridge service life.[3, 5-11] OSHA offers guidance on using mathematical models to estimate respirator cartridge service life based on single components, but the models have not been adopted for mixtures. NIOSH has developed a computer tool for estimating breakthrough times and service lives of respirator cartridges. Manufacturers can use those results to make service-life recommendations for their particular product (canister/cartridge) in multi-gas environments. Two types of mathematical models are used: 1) predictive models[3, 5-7] and 2) descriptive models.[9] Each model has its own mathematical basis for its estimations. To estimate the service lives of cartridges, the following information is needed:

- the number of cartridges used by the respirator
- the mass of the sorbent used in each cartridge
- the carbon micro-pore volume
- the density of the packed bed
- the maximum temperature
- the maximum relative humidity
- the maximum concentration of the contaminants and the work (volumetric flow) rate.

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

In addition to the methods described above, “rules of thumb” can be allowed as part of the overall workplace organic vapor assessment for determining a cartridge change-out schedule. Chapter 36 of the American Industrial Hygiene Association publication, *The Occupational Environment: Its Evaluation and Control and Management*, outlines the approach.[12] The “rules of thumb” may not work for every chemical or situation, but can provide an estimate 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., vapors from Hanford tank farms) and inorganic gases such as ammonia, sulfur dioxide, and hydrogen sulfide, compositions that vary with time, location, and contaminants that undergo continuous reactions. However, some of the general drivers⁹ can help in interpreting the results obtained from experimental testing of respirator cartridges.

⁹ The general drivers (a.k.a., rules of thumb) are applicable to certain compounds, but not to all compounds in a mixture, such as those in specific Hanford tank mixtures. However, an IH 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 AN primary exhausters.[13-15] The test system and methodology were developed in consultation with recognized subject matter experts to follow the example of tank farm headspace field sampling for the purposes of cartridge testing.

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

The APR cartridge test assembly was designed and constructed to operate 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 vapors source sampling was performed on headspace or exhausters 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 shown 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-SC1¹⁰ for Survey 2.[16] These cartridges were chosen because they are suitable for capturing organic vapors, acid gases, ammonia, formaldehyde, and particulates.[16]

¹⁰ SCOTT part numbers 7422-SC1 and 7422-SD1 are multipurpose APR 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.3m-scott.com/download/742-series-cartridges-user-instructions-english/>

Vapor concentrations upstream and downstream of the APR cartridge were monitored with an array of sorbent tubes (see Appendix B). Influent (upstream) concentrations were measured every 2 hours until the experiment was finished. 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.

4.0 Data Analysis

Respirator cartridge testing on the AN primary exhausters was conducted from September 30–October 2, 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 lists the raw data for all of contaminants analyzed during the tests, and Appendix D lists the corresponding calculated concentrations for the detected COPCs. Appendix C also gives the temperatures of the sample slipstream during testing, which ranged from 55 to 81°F, and the relative humidity ranged from 25 to 84%. Table 1 provides an overview of the results for each of the 59 COPCs. Note that nitrous oxide was not analyzed as it is not susceptible to respirator filtration, and there are no known NIOSH-approved respirator filtration cartridges approved for nitrous oxide. Additionally, methanol was not quantified as part of the COPC data set because it is used as a standard solvent and calibration standard in the analytical procedure for volatile organic compounds (VOC).

Table 1 shows the measured concentrations in the current study for all of the COPCs tested. 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),¹¹ that compound is marked accordingly. Further, if concentrations were detected for a compound, the extent of the detection is also described. Inlet concentrations of three COPCs—ammonia, N-nitrosodimethylamine (NDMA) and N-nitrosomethylethylamine (NMEA)—exceeded their corresponding OELs. The inlet (or outlet) concentrations of four additional COPCs were lower than their corresponding OELs but still exceeded 10%. These COPCs were mercury, 2,5-dihydrofuran, N-nitrosodiethylamine (NDEA), and N-nitrosomorpholine. All seven of the aforementioned COPCs are highlighted in yellow in Table 1. All seven COPCs identified above with measured concentrations or DLs exceeding 10% of their respective OELs are assessed in more detail in Section 5.0. Appendix E shows similar detailed assessments for an additional eight COPCs with respirator cartridge inlet (or outlet) concentrations or DLs <10% of the OEL but >2%. These COPCs were 1,3-butadiene, formaldehyde, furan, 2,3-dihydrofuran, 2-pentylfuran, acetonitrile, ethylamine, and dibutyl butylphosphonate. All of the other COPCs had inlet (or outlet) concentrations or DLs <2% of their OELs.

¹¹ The term “detection limit” is used here to refer either to analytical reporting limit (RL) or DL. The use of either a RL or DL varied among analytical laboratories. The RL (equivalent to a limit of quantification) was used instead of a 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. Nitrosamine results were quantified to an RL.

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	32.5 ppm	25 ppm	2.59%		Up to 130% of OEL for inlet values. All outlets <36%.
2 Nitrous Oxide	10024-97-2	Not Measured	50 ppm			
3 Mercury	7439-97-6	4.10 ug/m3	25 ug/m3	7.25%		Up to 16.4% of OEL for inlet values. All outlets <DL.
Hydrocarbons						
4 1,3-Butadiene	106-99-0	0.0215 ppm	1 ppm	2.15%	X	
5 Benzene	71-43-2	0.0003 ppm	0.5 ppm	0.027%		Up to 0.063% of OEL for inlet values. All outlets <DL.
6 Biphenyl	92-52-4	0.0012 ppm	0.2 ppm	0.602%	X	
Alcohols						
7 1-Butanol	71-36-3	0.0378 ppm	20 ppm	0.004%		Up to 0.19% of OEL for inlet values. All outlets <0.02%.
8 Methanol	67-56-1	Not Measured	200 ppm			
Ketones						
9 2-Hexanone	591-78-6	0.0002 ppm	5 ppm	0.004%		Up to 0.004% of OEL for inlet values. All outlets <DL.
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	0.0002 ppm	0.5 ppm	0.032%		Up to 0.047% of OEL for inlet values. All outlets <DL.
12 6-Methyl-2-heptanone	928-68-7	Not Detected	8 ppm	TIC	X	
13 3-Buten-2-one	78-94-4	0.0009 ppm	0.2 ppm	0.096%		Up to 0.45% of OEL for inlet values. All outlets <DL.
Aldehydes						
14 Formaldehyde	50-00-0	0.0131 ppm	0.3 ppm	0.623%		Up to 4.4% of OEL for inlet values. All outlets <0.8%.
15 Acetaldehyde	75-07-0	0.0151 ppm	25 ppm	0.005%		Up to 0.06% of OEL for inlet values. All outlets <0.04%.
16 Butanal	123-72-8	0.0005 ppm	25 ppm	0.001%		Up to 0.002% of OEL for inlet values. All outlets <0.002%.
17 2-Methyl-2-butenal	1115-11-3	Not Detected	0.03 ppm	TIC	X	
18 2-Ethyl-hex-2-enal	645-62-5	Not Detected	0.1 ppm	TIC	X	

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

² TIC [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 The Inlet maximum using the Carbotrap 300 TDU method was 84.7% of the OEL for the 7422-SD1 cartridge and 77.5% for the 7422-SC1 cartridge. Furans measured on the effluent were all below the DL, indicating no breakthrough for either cartridge during the testing period. All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below the DLs.

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						
19 Furan ³	110-00-9	0.06 ppb	1 ppb	5.81%	X	
20 2,3-Dihydrofuran	1191-99-7	0.03 ppb	1 ppb	3.11%	X	
21 2,5-Dihydrofuran	1708-29-8	0.11 ppb	1 ppb	4.38%		Up to 10.7% OEL for inlet values. All outlets <DL.
22 2-Methylfuran	534-22-5	0.02 ppb	1 ppb	1.25%		
23 2,5-Dimethylfuran	625-86-5	0.02 ppb	1 ppb	1.84%	X	Up to 1.3% OEL for inlet values. All outlets <1.6%.
24 2-Ethyl-5-methylfuran	1703-52-2	Not Detected	1 ppb	TIC	X	
25 4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	Not Detected	1 ppb	TIC	X	
26 3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	Not Detected	1 ppb	TIC	X	
27 2-Pentylfuran	3777-69-3	0.03 ppb	1 ppb	1.43%		Up to 3.1% of OEL for inlet values. All outlets <2.0%.
28 2-Heptylfuran	3777-71-7	0.02 ppb	1 ppb	1.56%		All inlets <DL. All outlets <1.6%.
29 2-Propylfuran	4229-91-8	0.013 ppb	1 ppb	1.30%	X	
30 2-Octylfuran	4179-38-8	Not Detected	1 ppb	TIC	X	
31 2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	Not Detected	1 ppb	TIC	X	
32 2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not Detected	1 ppb	TIC	X	
Phthalates						
33 Diethylphthalate	84-66-2	0.0133 mg/m3	5 mg/m3	0.266%	X	
Nitriles						
34 Acetonitrile	75-05-8	1.20 ppm	20 ppm	0.001%		Up to 1.2% of OEL for inlet values. All outlets <6.0%.
35 Propanenitrile	107-12-0	0.0004 ppm	6 ppm	0.004%		Up to 0.005% of OEL for inlet values. All outlets <0.008%.
36 Butanenitrile	109-74-0	0.0002 ppm	8 ppm	0.003%		Up to 0.002% of OEL for inlet values. All outlets <DL.
37 Pentanenitrile	110-59-8	0.0002 ppm	6 ppm	0.007%		Up to 0.007% of OEL for inlet values. All outlets <DL.
38 Hexanenitrile	628-73-9	0.0002 ppm	6 ppm	0.003%	X	
39 Heptanenitrile	629-08-3	Not Detected	6 ppm	TIC	X	
40 2-Methylene butanenitrile	1647-11-6	Not Detected	0.3 ppm	TIC	X	
41 2,4-Pentadienenitrile	1615-70-9	Not Detected	0.3 ppm	TIC	X	

Table 1. (continued)

COPC Number and Name	CAS Number	Highest Measured Value (this study)	Occupational Exposure Limit (OEL)	Approximate Analytical Detection Limit, DL ¹ (% of OEL)	All Data Values (inlet and outlet) < Detection Limit	Highest Detected Value Compared to OEL
Amines						
42 Ethylamine	75-04-7	0.1467 ppm	5 ppm	0.096%		Up to 2.9% of OEL for inlet values. All outlets <DL.
Nitrosamines						
43 N-Nitrosodimethylamine	62-75-9	13.8 ppb	0.3 ppb	12.7%		Up to 4589% of OEL for inlet values. All outlets <DL.
44 N-Nitrosodiethylamine	55-18-5	0.07 ppb	0.1 ppb	25.7%		Up to 70.8% of OEL for inlet values. All outlets <DL.
45 N-Nitrosomethylethylamine	10595-95-6	0.32 ppb	0.3 ppb	9.93%		Up to 106% of OEL for inlet values. All outlets <DL.
46 N-Nitrosomorpholine	59-89-2	0.20 ppb	0.6 ppb	3.61%		Up to 32.9% of OEL for inlet values. All outlets <DL.
Organophosphates						
47 Tributyl phosphate	126-73-8	0.98 ppb	200 ppb	0.488%	X	
48 Dibutyl butylphosphonate	78-46-6	0.67 ppb	7 ppb	9.52%	X	
Halogenated						
49 Chlorinated Biphenyls	Varies	Not Detected	1 mg/m3	TIC	X	
50 2-Fluoropropene	1184-60-7	Not Detected	0.1 ppm	TIC	X	
Pyridines						
51 Pyridine	110-86-1	0.46 ppb	1000 ppb	0.036%		Up to 0.05% of OEL for inlet values. All outlets <DL.
52 2,4-Dimethylpyridine	108-47-4	0.27 ppb	500 ppb	0.054%	X	
Organonitrites						
53 Methyl nitrite	624-91-9	Not Detected	0.1 ppm	TIC	X	
54 Butyl nitrite	544-16-1	Not Detected	0.1 ppm	TIC	X	
Organonitrates						
55 Butyl nitrate	928-45-0	Not Detected	2.5 ppm	TIC	X	
56 1,4-Butanediol, dinitrate	3457-91-8	Not Detected	0.05 ppm	TIC	X	
57 2-Nitro-2-methylpropane	594-70-7	Not Detected	0.3 ppm	TIC	X	
58 1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	Not Detected	0.05 ppm	TIC	X	
Isocyanates						
59 Methyl Isocyanate	624-83-9	Not Detected	20 ppb	TIC	X	

5.0 Plots of COPCs with Significant Detected Values

Of the 59 COPCs in Table 1, only three COPCs—ammonia, NDMA, and NMEA—exceeded their OELs. Four additional COPCs—mercury, 2,5-dihydrofuran, NDEA, and N-nitrosomorpholine—had inlet concentrations less than their corresponding OEL but >10% (see COPCs highlighted in yellow in Table 1). This section provides more detail on these seven 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. The inlet ammonia concentrations were relatively consistent between 100% and 130% of the OEL at the beginning of the campaign for both cartridges, but decreased after 10 hours, for SCOTT 7422-SD1 to 11% before returning to ~120% of the OEL by the end of testing. This sudden decrease and increase in ammonia concentration are likely a result of analytical error or flow rate measurement error. Outlet concentrations for both cartridges exceeded the DL midway through the test and exceeded 10% of the OEL after 10 hours.

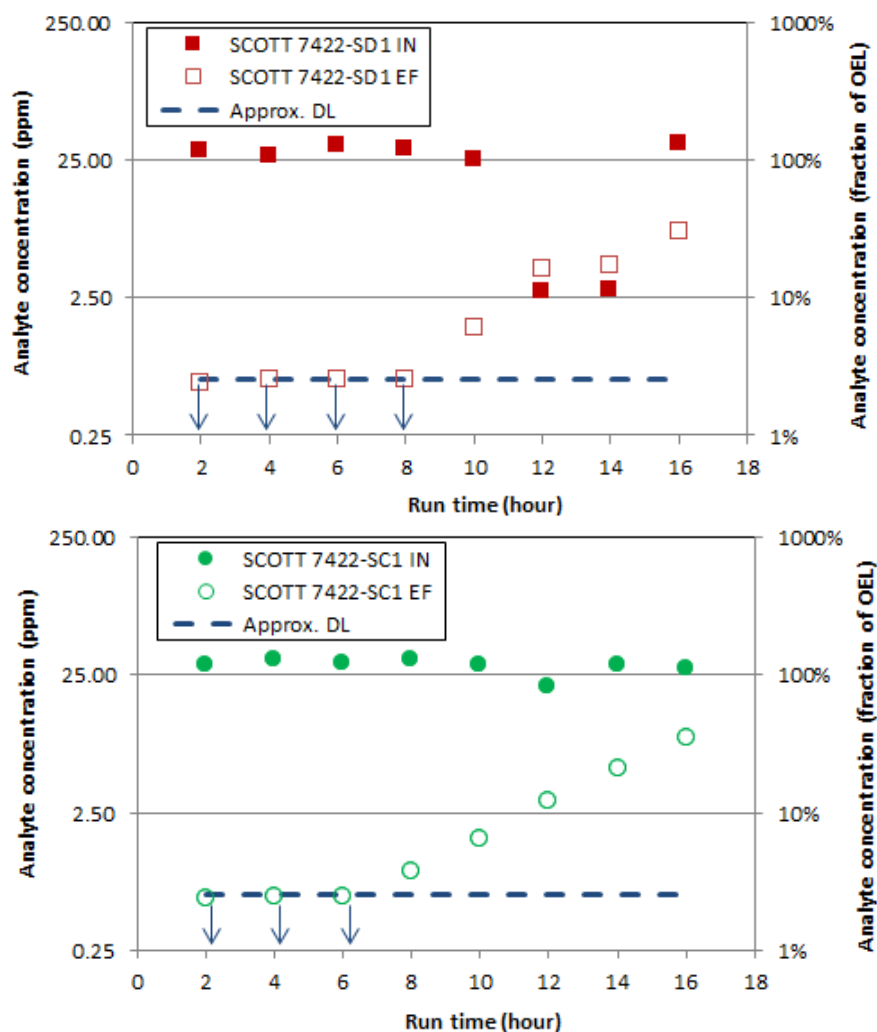


Figure 1. Plot of Measured Ammonia Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Mercury (see Figure 2) – The DL for mercury corresponds to ~7.3% of the OEL. Inlet concentrations measured throughout the testing period for SCOTT 7422-SD1 and SCOTT 7422-SC1 cartridges remained relatively consistent between 10% and 12% of the OEL, with only two exceptions. There was a decrease in concentration to less than the DL at 14 hours for SCOTT 7422-SD1, and the final, 16-hour inlet concentration for SCOTT 7422-SC1 increased to a maximum of 16.4% of the OEL. All outlet concentrations were below the DL, indicating no evidence of breakthrough over the measured time period for either cartridge tested.

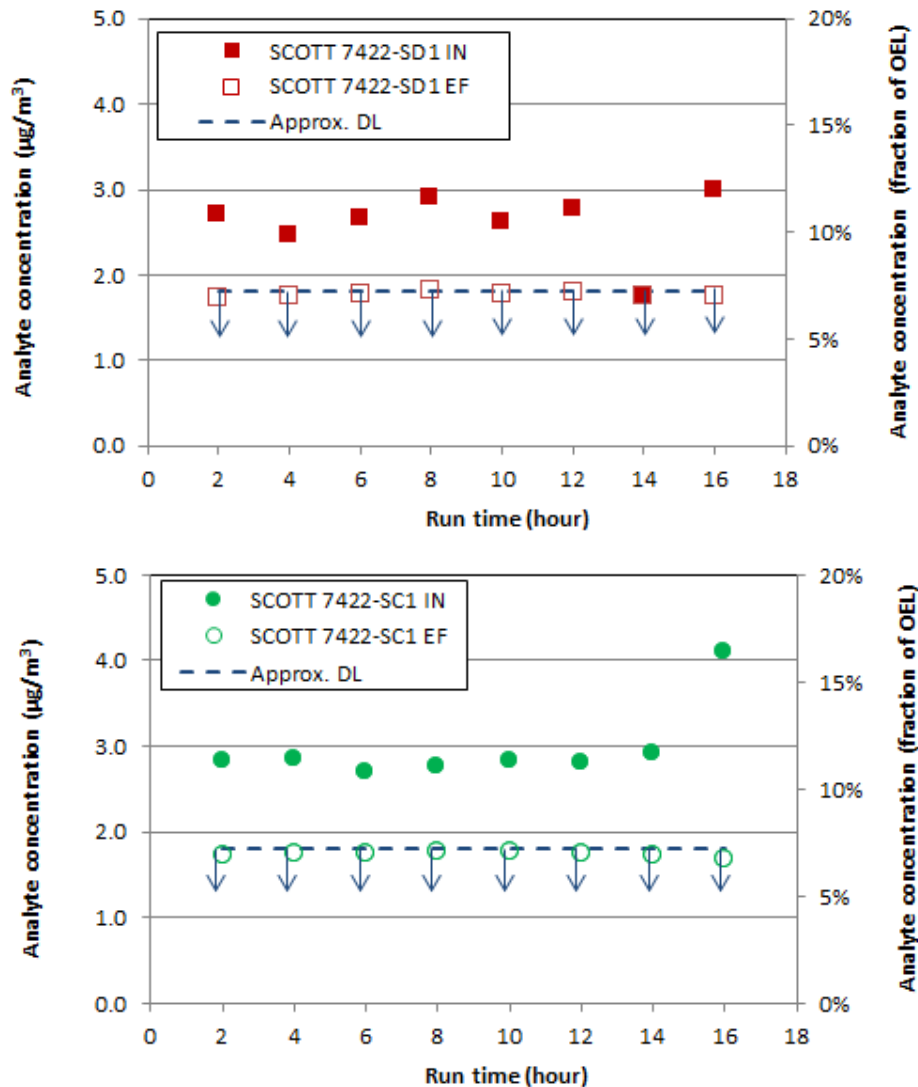


Figure 2. Plot of Measured Mercury Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2,5-Dihydrofuran (see Figure 3) – The DL for 2,5-dihydrofuran corresponds to ~4.4% of the OEL. Inlet concentrations for the SCOTT 7422-SD1 cartridge ranged from less than the DL to ~10.7% of its OEL. All inlet concentrations for SCOTT 7422-SC1 cartridge were less than the DL.¹² All outlet concentrations for both cartridges were below the DL, indicating no breakthrough for either cartridge.¹³

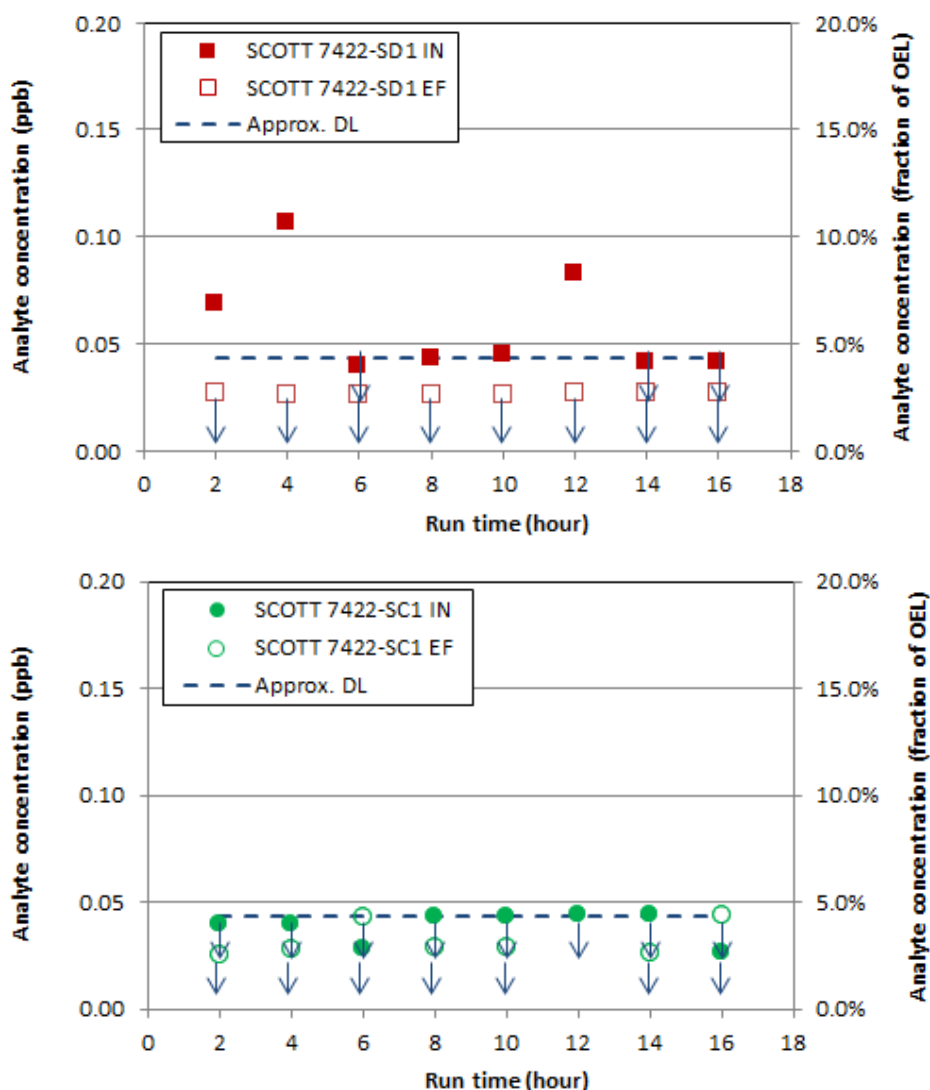


Figure 3. Plot of Measured 2,5-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

¹² All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below the DLs. The re-evaluation of 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU is discussed in Freeman et. al.[19].

¹³ Outlet concentration results for furan and all substituted furans for the 12-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

N-Nitrosodimethylamine (see Figure 4) – The DL for NDMA corresponds to ~12.7% of the OEL. All inlet measurements for both cartridge tests were significantly greater than the DL, ranging between 486% and 4589% of the OEL. However, all of the outlet measurements were below the analytical DL for both respirator cartridges. Even though the DL is slightly >10% of the OEL, there is no evidence of breakthrough over the measured time period for either cartridge tested.

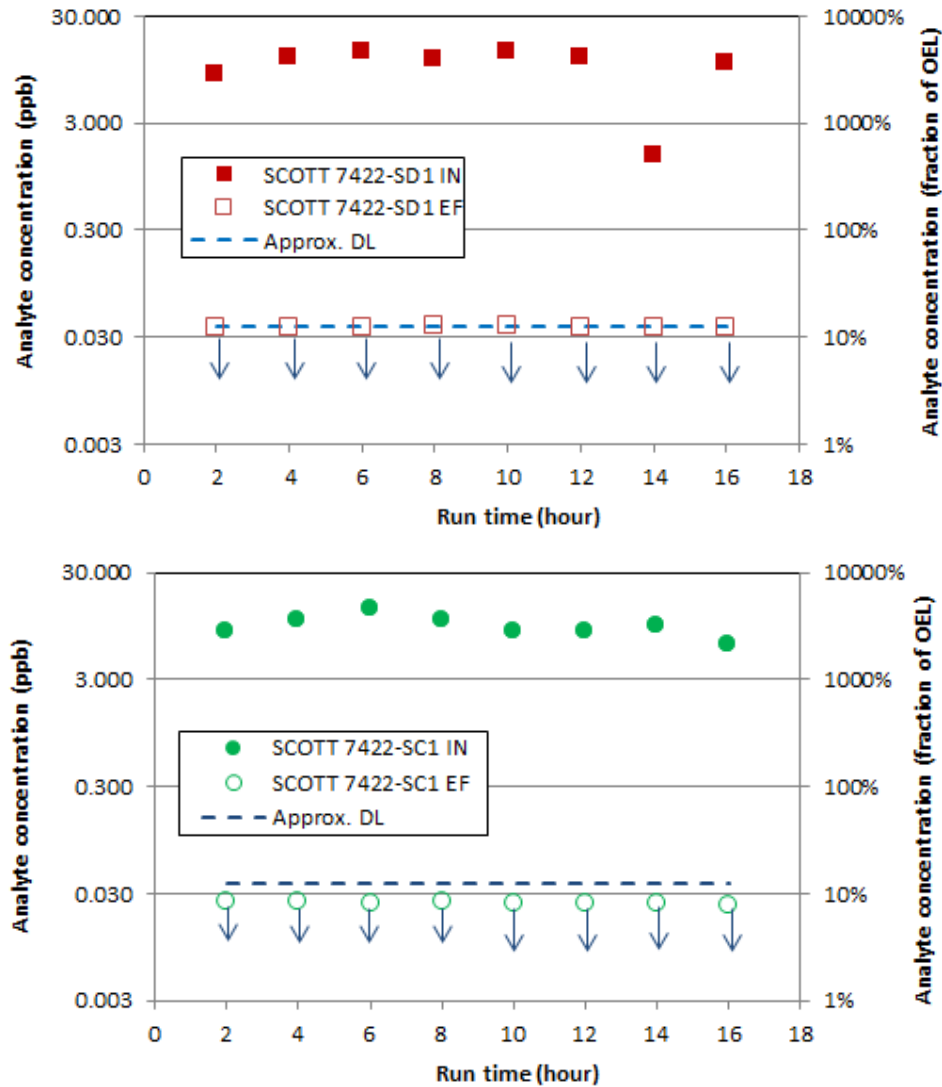


Figure 4. Plot of Measured N-Nitrosodimethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosodiethylamine (see Figure 5) – The DL for NDEA corresponds to ~25.7% of the OEL. The maximum inlet concentrations for both cartridges were observed in the first 6 hours of each test and ranged from 42.9% to 70.8% of the OEL.¹⁴ Inlet concentrations for the remainder of each test were all less than the DL. All of the respirator outlet measurements were below the DL. Even though the DL is >10% of the OEL, there is no evidence of breakthrough over the measured time period for either cartridge tested.

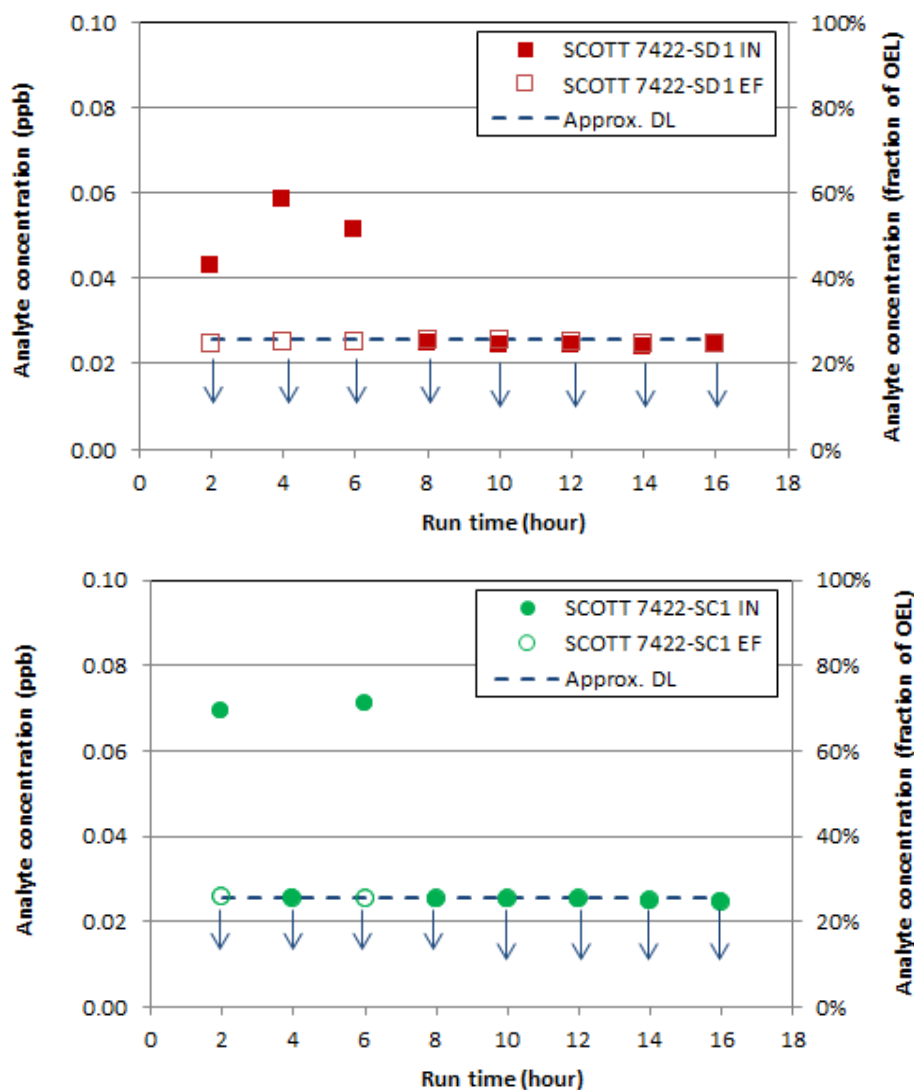


Figure 5. Plot of Measured N-Nitrosodiethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

¹⁴ Although five inlet concentration measurements for NDEA are reported greater than the DL, analytical laboratory quality assurance flags indicate these analyte measurements are not confirmed. The analyte was detected on initial analysis, but not detected at or above the DL/RL on confirmation analysis.

N-Nitrosomethylethylamine (see Figure 6) – The DL for NMEA corresponds to ~9.9% of the OEL. All inlet measurements for both respirator cartridges were higher than the DL, with several measurements exceeding its corresponding OEL. All of the respirator outlet measurements were below the DL; therefore, there is no evidence of breakthrough over the measured time period for either cartridge tested.

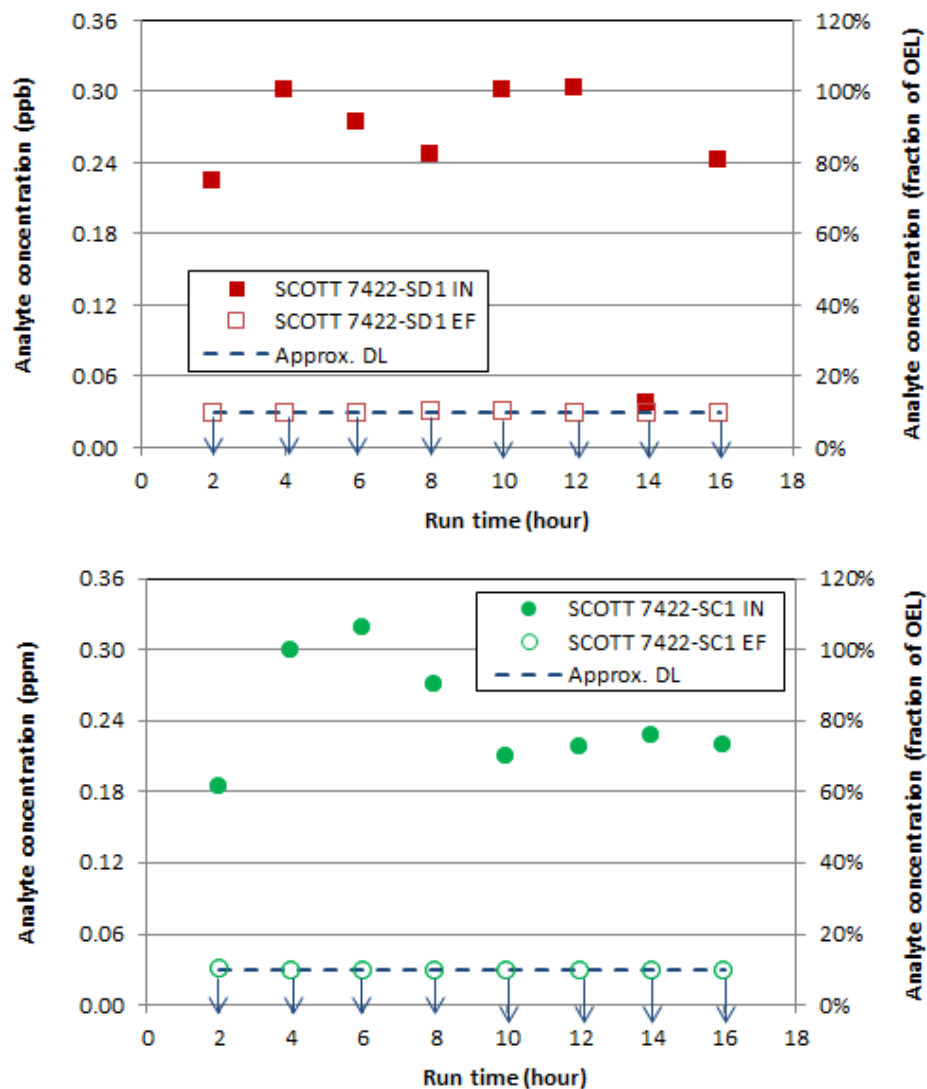


Figure 6. Plot of Measured N-Nitrosomethylethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

N-Nitrosomorpholine (see Figure 7) – The DL for N-Nitrosomorpholine corresponds to ~3.6% of the OEL. The respirator cartridge inlet concentrations for both cartridges started below 10% of the OEL at the beginning of each test and increased to ~33% of the OEL before decreasing again later in the tests. All outlet concentrations were less than the analytical RL, indicating no breakthrough for either cartridge.

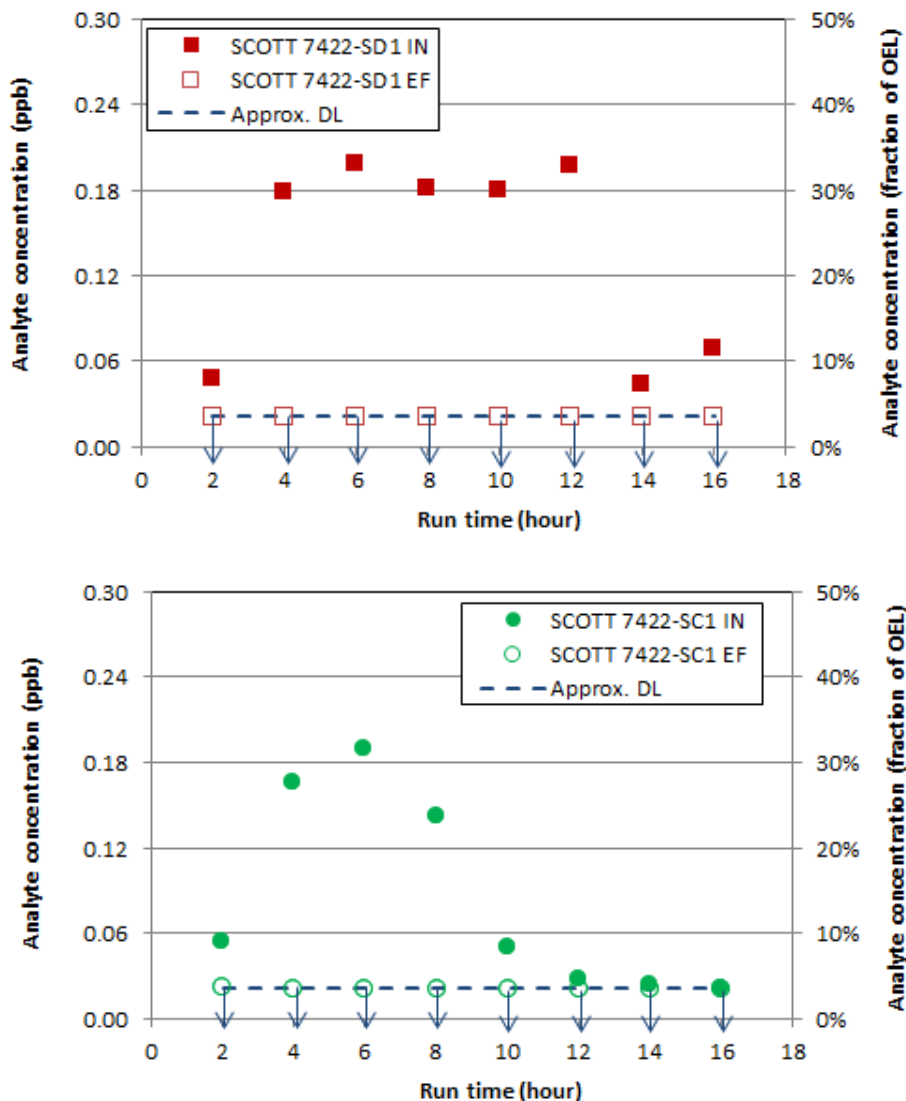


Figure 7. Plot of Measured N-Nitrosomorpholine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

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 AN Exhauster data from TWINS and the Site-Wide Industrial Hygiene Database were used for this assessment.

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

In total, 10 COPCs have been previously measured in the AN Exhauster stack at concentrations above 10% of their respective OELs and above analytical RLs. These COPCs include ammonia, nitrous oxide, mercury, 1-butanol, formaldehyde, 2,3-dihydrofuran, ethylamine, NDMA, NMEA, and N-nitrosomorpholine. Of these 10 COPCs, eight were detected in the cartridge study, but consistently at lower average and maximum concentrations than historic analyses. Specifically:

- Ammonia average and maximum inlet concentrations measured in this cartridge study were 45% and 76% lower than historic exhauster stack measurements.
- Mercury average and maximum inlet concentrations measured in this cartridge study were 94% and 99% lower, respectively, (i.e., approximately 18 and 110 times lower) than historic AN Exhauster measurements.
- The maximum concentration for formaldehyde from this cartridge testing measured 4% of the OEL, compared to maximum historic exhauster concentrations of 75% and average concentrations of 12%.
- Furan and 2,3-dihydrofuran reported average historic exhauster concentrations of 188% and 17% of the OEL, respectively. However, historic measurements for all other substituted furans were less than the RL. In contrast, the cartridge study measurements indicated less than the DL concentrations for furan and 2,3-dihydrofuran. Three other furan compounds—2,5-dihydrofuran, 2-methylfuran, and 2-pentylfuran—were detected in the cartridge study inlet at average and maximum concentrations ranging from ~1% to 11% of their OELs, compared to historic measurements that were less than the RLs.¹⁵
- NDMA, NMEA, and N-nitrosomorpholine average inlet concentrations measured in this study ranged from 34% to 58% lower than historic exhauster stack measurements. The maximum NDMA inlet concentration in this study (4589% of the OEL) was approximately 20 times lower than the historic maximum AN Exhauster measurement of nearly 86,000% of the OEL (257 ppb). For the nitrosamine family of compounds, only NDEA reported historic concentrations that were less than the RL, while average and maximum concentrations for NDEA from this study measured approximately 35 and 71% of the OEL, respectively. However, these inlet NDEA concentrations had analytical laboratory quality flags indicating the concentrations greater than the RL could not be confirmed.

¹⁵ Inlet concentrations for furan using the Carbotrap 300 TDU results were significantly higher than documented in this report (using the Tenax tube) although breakthrough was not observed on either cartridge. The inlet maximum using the Carbotrap 300 TDU method was 84.7% of the OEL for the 7422-SD1 cartridge and 77.5% for the 7422-SC1 cartridge. Furans measured on the effluent were all below the DLs, indicating no breakthrough for either cartridge during the testing period. All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below the DL. The re-evaluation of furan, 2,5-dihydrofuran, and 2-methylfuran using the Carbotrap 300 TDU are discussed in Freeman et al.[19].

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

COPC Number and Name	CAS Number	Boiling Point (°F)	Occupational Exposure Limit (OEL)	Historical Measurements ¹					Measurements in this Study	
				# of Values	Max. Value	Average Value	Max. Value (% OEL)	Average Value (% OEL)	Max Inlet Value (% OEL)	Highest Value from Respirator Outlet (% OEL)
2 Nitrous Oxide	10024-97-2	-127	50 ppm	4	27.6	19.7	55%	39%	Not Measured	
1 Ammonia	7664-41-7	-28	25 ppm	37	134	46.4	536%	186%	130%	35%
50 2-Fluoropropene	1184-60-7	-11	0.1 ppm	4	<RL	<RL	<RL	<RL	Not Detected - TIC	
14 Formaldehyde	50-00-0	-6	0.3 ppm	46	0.224	0.0358	75%	12%	4.4%	0.74%
53 Methyl nitrite	624-91-9	10	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC	
4 1,3-Butadiene	106-99-0	24	1 ppm	36	<RL	<RL	<RL	<RL	2.2% (RL) ²	2.1% (RL)
42 Ethylamine	75-04-7	62	5 ppm	27	0.611	0.0842	12%	1.7%	2.9%	0.096% (RL)
15 Acetaldehyde	75-07-0	69	25 ppm	20	0.191	0.105	0.76%	0.42%	0.060%	0.037%
19 Furan	110-00-9	88	1 ppb	50	<RL	1.88	<RL	188%	5.8% (DL)	5.8%(DL)
59 Methyl Isocyanate	624-83-9	103	0.02 ppm	1	<RL	<RL	<RL	<RL	Not Detected - TIC	
20 2,3-Dihydrofuran	1191-99-7	130	1 ppb	18	0.405	0.169*	41%	17%*	3.1% (DL)	3.1% (DL)
22 2-Methylfuran	534-22-5	147	1 ppb	49	<RL	<RL	<RL	<RL	1.3%	1.5%
8 Methanol	67-56-1	148	200 ppm	15	<RL	<RL	<RL	<RL	Not Measured	
21 2,5-Dihydrofuran	1708-29-8	152	1 ppb	50	<RL	<RL	<RL	<RL	10.7%	4.4% (DL)

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

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

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

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

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

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

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

7.0 Conclusions

Testing was conducted during the September 30–October 2, 2016, period using a slipstream from the AN tank farms exhausters under static conditions. The vapors were fed to a respirator cartridge test stand developed by WRPS in collaboration with HiLine Engineering (Richland, Washington). Multipurpose respirator cartridges SCOTT 7422-SD1 and SCOTT 7422-SC1 (SCOTT Safety, Monroe, North Carolina) were each assessed with the tank farm exhausters vapors in tests conducted on separate days. Sorbent tubes were used to collect samples of the vapor stream entering and exiting the respirator cartridge and were subsequently analyzed for COPC concentrations. PNNL was tasked to independently analyze the collected data and make recommendations based on the results for respiratory cartridge performance and service life.

The AN Exhauster data are expected to provide conservatively high COPC concentrations compared to the ambient concentrations inside and outside the tank farm. Further, the flow rate through each respirator cartridge was maintained conservatively high compared to normal human breathing rates. Temperatures of the sample slipstream during testing ranged from 55 to 81°F, and the relative humidity ranged from 25 to 84%. The inlet concentrations measured are shown in Table 1. Thus, any conclusions on respirator cartridge performance pertain to the above-stated conditions.

Key conclusions from the assessment of the 59 COPCs in this study are described below:

- Based on measured cartridge inlet vapor concentrations from the AN Exhauster, three COPCs, ammonia, NDMA, and NMEA, exceeded their corresponding OEL.¹⁶ Four COPCs—mercury, 2,5-dihydrofuran, NDEA, and N-nitrosomorpholine—reported one or more inlet concentration measurements >10% of their corresponding OEL, but <100%. Inlet and outlet measurements for all other COPCs did not exceed 10% of their respective OELs.
- Ammonia concentrations at the respirator cartridge inlet reached a maximum of 130% of its OEL (32.5 ppm), which was significantly lower than the maximum historical measurement of 536% of its OEL from the AN Exhauster. For both cartridges, ammonia appeared to breakthrough, above 10% of its OEL after 10 hours. The inlet ammonia concentrations were relatively consistent at the beginning of the campaign for both cartridges. However, a significant decrease in ammonia inlet concentrations was observed at the 12- and 14-hour measurements for the SCOTT 7422-SD1 cartridge. The sudden decrease and increase in ammonia concentration are likely a result of analytical error or flow rate measurement error.
- Cartridge inlet concentration measurements for NDMA reached 4589% of its OEL (13.7 ppb), which was significantly lower than maximum and average historical measurements from the AN Exhauster; that is 85667% and 8033% of the OEL, respectively. However, all outlet concentrations were less than the analytical RL of ~13% of the OEL, indicating no breakthrough for either cartridge.

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, NIOSH, American Conference of Governmental Industrial Hygienists), or if no U.S. OEL exists, standard toxicological practices are applied to develop OELs using non-U.S. exposure limits, other established OELs for chemical surrogates when available, or other standard procedures. The OEL for NDMA was established in 2005 based on the MAK (Maximale Arbeitsplatzkonzentration) Commission standard adopted in Europe.

- Cartridge inlet concentrations for NMEA reached 106% of its OEL (0.32 ppb), which was lower than maximum and average historical measurements from the exhauster of 285% and 125%, respectively. However, all outlet concentrations were less than the analytical RL of ~10% of the OEL, indicating no breakthrough for either cartridge.
- Mercury inlet concentrations measured throughout the testing period for both cartridges remained relatively constant between 10% and 12% of its OEL, with two exceptions when the concentration decreased to less than the DL in one test and increased to a maximum of 16% of the OEL in the other test. Overall, inlet concentrations of mercury during cartridge testing were substantially lower than average and maximum historic AN Exhauster measurements of ~200% and 1800% of the OEL, respectively. Mercury outlet concentrations during this study were all below the DL, indicating no breakthrough for the testing period.
- Maximum NDEA inlet concentrations for both cartridges were observed during the first 6 hours of each test and ranged from 43% to 71% of the OEL. Inlet concentrations for the remainder of each test were less than the DL. All of the respirator outlet measurements were below the DL, indicating no breakthrough for either cartridge.
- N-Nitrosomorpholine inlet concentrations reached a maximum of ~33% of the OEL early in each test, before decreasing at later sample times. All outlet concentrations were less than the DL, indicating no breakthrough for either cartridge.
- The inlet concentration for 2,5-dihydrofuran¹⁷ on the Tenax TU tube reached a maximum of ~11% of its OEL in tests with the SCOTT 7422-SD1 cartridge. However, the majority of inlet measurements for both cartridges were at or near the analytical DL. All outlet concentrations for both cartridges were less than the DL, indicating no breakthrough for either cartridge.

¹⁷ All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below DL. The re-evaluation of furan, 2,5-dihydrofuran and 2-methylfuran using the Carbotrap 300 TDU is discussed in Freeman et. al.[19]

8.0 Recommendations

- Based on the measurements taken for this study, ammonia breakthrough, above 10% of its OEL, occurred after 10 hours for both cartridges (SCOTT 7422-SD1 and SCOTT 7422-SC1). Inlet concentrations of ammonia remained relatively constant with an average of 118% of the OEL (29.5 ppm) up through the 10-hour sample period.
- 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.
- Historic concentrations from the AN Exhauster for a number of COPCs including ammonia, mercury, and NDMA were substantially higher than concentrations measured at the cartridge testing inlet and should be carefully considered. These factors, along with the measured breakthrough, should be used to inform an Industrial Hygiene determination of APR applicability and an appropriate respirator cartridge change-out schedule for adequate worker protection.
- Additional recommendations related to NDMA and NDEA DLs, TICs, further data assessment, and future testing documented in PNNL-25860¹⁸ for respirator cartridge testing on a slipstream from the Hanford AP tank exhauster are also relevant to the AN Exhauster. Future testing and multi-tank analysis of cartridge performance with a wider range of COPC concentrations and test conditions should help improve understanding of overall cartridge performance.

¹⁸ Nune, SK, J Liu, CJ Freeman, and TM Brouns. 2016. *Analysis of Respirator Cartridge Performance Testing on a Hanford AP Tank Farm Primary Exhauster Slipstream*. PNNL-25860, Pacific Northwest National Laboratory, Richland, Washington. (Unpublished)

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Appendix A

Description of Respirator Cartridge Testing Setup

Appendix A

Description of Respirator Cartridge Testing Setup

The respirator cartridge-testing system was developed by Washington River Protection Solutions and HiLine Engineering (Richland, Washington) as a means to comprehensively test respirator cartridge performance with actual Hanford tank headspace or exhaust slip stream gases. Tank headspace or exhaust slip stream vapors are pulled direct from the source through a flexible hose connecting the tank or exhaust sampling port within the tank farm/exhauster fence line to the respirator cartridge-testing system outside the farm.[13,14] Multiple in-line particulate filters are installed in the line between the tank/exhauster and test system to remove potential radioactive particulates. Each filter unit contains a hydrophobic Fluoropore™ polytetrafluoroethylene filter (Millipore Sigma, Billerica, Massachusetts) that is required pursuant to the radiological work permit. This polytetrafluoroethylene filter medium is the same material used for routine tank vapor area monitoring as well as sampling and analysis of sources (headspace and exhausters) and 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 the vapor stream to be sampled both before and after the cartridge, so that performance for a given COPC can be quantified. Sorbent media tubes were used to capture the COPCs and other hazardous contaminants. After a given test segment, the sorbent tubes were removed and analyzed. Sampling of the exhaust gas was performed every 2 hours, but this timing can be modified as necessary.

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

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

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

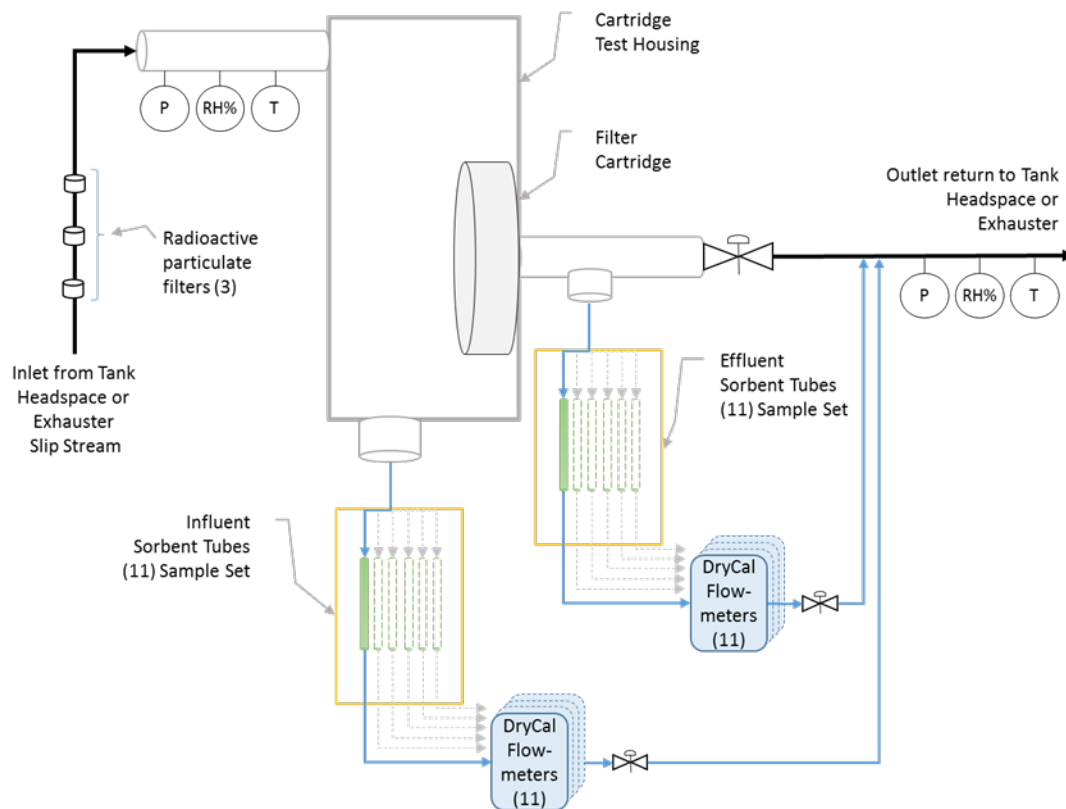


Figure A.1. General Schematic of Respirator Cartridge Test Apparatus

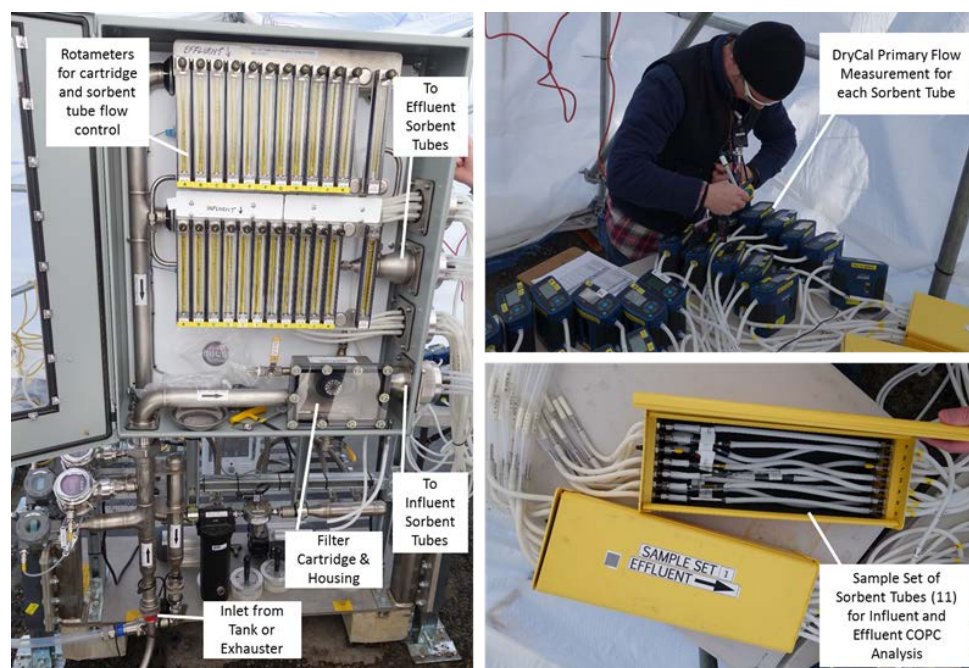


Figure A.2. Photographs of the Respirator Cartridge Test Equipment

Appendix B

Analytical Testing

Appendix B

Analytical Testing

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

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

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

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

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

^a Analytical Method

NIOSH: National Institute of Occupation Safety and Health

EPA: U.S. Environmental Protection Agency

OSHA: Occupational Safety and Health Administration

^b Instrument Used

GC-FID: Gas Chromatography-Flame Ionization Detector

GC/MS: Gas Chromatography-Mass Spectrometry

CVAA: Cold Vapor Atomic Absorption

IC: Ion Chromatography

HPLC: High Performance Liquid Chromatography

GC-TEA: Gas Chromatography-Thermal Energy Analyzer

HPLC-UV: High Performance Liquid Chromatography-Ultraviolet Detector

^c Analysis Location

ALS: ALS Environmental Salt Lake City

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

WHL-222S: Wastren Hanford Laboratory

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

Appendix C

Raw Analytical Data

Appendix C

Raw Analytical Data

C.1 Description

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

The raw analytical data is given only 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 (fresh air vs. tank vapor) running through the test system before initiation of tank vapor testing.

'8765' designations correspond to testing with the SCOTT 7422-SD1 respirator cartridge, whereas '8766' designations correspond to testing with the SCOTT 7422-SC1 respirator cartridge.

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

The sample IDs embed the information given above. For example, sample ID 16-08765-5-IN-A corresponds to the first cartridge survey (16-08765), sample line 5, and the first (0 to 2 hours) influent sample bundle (IN-A).

The flow rate passing through the respirator cartridge was approximately 30 L/min, while the sampling flow rates through the sorption tubes ranged between 30 and 200 mL/min for different chemicals that were being collected. WRPS provided these flow rates in files 'AN Farm Flow Rate 9-30-2016.xlsx' for the first survey with SCOTT 7422-SD1 and 'AN Farm Flow Rate 10-1-2016.xlsx' for the second survey with SCOTT 7422-SC1. The information is shown in the tables below. Columns labeled Mach. Base 1 and Mach. Base 2 refer to the 'BASE' baseline samples for influent and effluent, respectively, to verify machine cleanliness prior to experimental measurements.

WRPS provided the temperature and humidity information in files 'AN Farm DRI 9-30-2016.xls' and 'AN Farm DRI 10-1-2016.xls.' The information is shown in the tables provided in this appendix. Several terms used in the DRI files are described below.

- 'Pre' and 'Post' indicate the general time signature when the direct read instrument measurements were taken. 'Pre' refers to the beginning of the 2-hour sample duration, and 'Post' refers to the end of the 2-hour sample duration.
- 'Influent' and 'Effluent' indicate the location of the measurement within the test system. 'Influent' measurements are taken at the inlet of the system upstream of the respirator cartridge. 'Effluent' measurements are taken downstream of the respirator cartridge. The pressure, temperature, and humidity effluent sensors are located at the end of the test system near the vacuum pump, whereas the DRI measurements for ammonia and 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 vs. 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.
- 'BLANK' means measurements obtained from sorbent tubes that have not had any vapor stream passed through them.

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

- SVOC: Biphenyl, Diethylphthalate, Tributyl phosphate, Dibutyl butylphosphonate, Dodecane, Hexadecane
- SVOCTIC: Undecane, Cyclotetrasiloxane, octamethyl, Decamethylcyclopentasiloxane, Dodecane, 4,6-dimethyl
- VOC: Acetone, Acetonitrile, Acetophenone, Benzene, Butanal, 1-Butanol, Butanenitrile, 3-Buten-2-one, Cyclohexane, Decane, Ethanol, Ethylbenzene, Furan, Hexane, Hexanone, Methylene Chloride, Propanenitrile, Styrene, Tetrachloroethene, Toluene, Trichlorofluoromethane

- VOCTIC: 2,6-Dimethyldecane, Decane, 2,3,5,8-tetramethyl-, Decane, 3,7-dimethyl-, Methenamine, Undecane, 2,6-dimethyl-
- Furans: 2,3-Dihydrofuran, 2-Pentylfuran, Furan, Tetrafulan
- Ethylamine (amines): Dimethylamine, Ethylamine, Methylamine
- Acetonitrile: Acetonitrile
- Mercury: Mercury
- Ammonia: Ammonia
- Aldehyde: Acetaldehyde, Acetone, Butyraldehyde, Formaldehyde, Hexanal, Propionaldehyde, Valeraldehyde
- 1,3 Butadiene: 1,3-Butadiene
- Pyridines: 2,4-Dimethylpyridine, Pyridine
- Nitrosamines: N-Nitrosodimethylamine.

C.2 Experimental Parameters

C.2.1 Flow Rates

SCOTT 7422-SD1 Cartridge (9/30/16) AN Exhauster

Volumes Air Collected (L)

Sample Box Number		Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2																
SVOC	A	3.86	4.13	3.83	4.10	3.93	4.15	1.20	4.12	4.07	4.10	4.12	1.83	4.13	4.16	3.85	0.56	3.77	4.01
VOC	B	4.12	3.98	4.33	3.82	4.13	3.75	4.25	3.55	3.84	3.68	3.77	4.01	3.88	3.59	3.84	3.71	3.77	3.81
Furans	C	3.98	6.04	4.00	6.11	4.14	6.40	4.20	6.46	4.04	6.38	3.95	6.27	3.93	6.10	3.93	6.08	3.87	5.85
Ethylamine	D	12.1	12.4	12.2	12.1	12.2	12.4	12.4	12.1	12.2	11.9	12.0	11.8	11.9	12.1	12.0	11.7	11.8	
Acetonitrile	E	11.8	12.1	12.1	12.4	12.5	12.7	12.4	12.2	12.2	12.0	11.9	11.5	11.8	11.1	11.8	12.4	11.8	11.7
Mercury	F	29.4	30.1	30.0	30.4	30.6	30.6	29.6	30.3	29.4	29.7	29.3	29.9	29.5	29.4	29.3	29.6	29.7	29.5
Ammonia	G	24.4	23.8	24.2	25.1	24.4	23.9	24.5	23.8	24.2	23.8	24.1	22.8	24.2	23.7	24.1	24.4	23.9	23.7
Aldehyde	H	24.4	23.7	24.2	24.4	24.2	24.0	24.5	24.0	24.2	23.6	23.8	23.3	23.7	23.5	23.7	23.5	23.7	23.7
1,3-Butadiene	I	23.7	23.8	24.2	24.2	24.5	24.0	23.4	23.8	22.5	22.9	22.2	22.9	22.8	23.1	23.6	23.2	23.7	24.1
Pyridine	J	119	121	118	118	118	119	118	121	116	119	116	119	116	119	117	119	115	118
Nitrosamines	K	244	236	243	238	247	239	248	240	243	236	242	234	242	235	241	236	238	232

Flow Rates (ml/min)

Sample Box Number		Mach.	Mach.	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2
Analyte	Line	Base 1	Base 2																
SVOC	A	32.2	34.4	31.9	34.2	32.8	34.6	10.0	34.3	33.9	34.2	34.4	15.3	34.4	34.7	32.1	4.6	31.4	33.5
VOC	B	34.3	33.2	36.0	31.8	34.4	31.3	35.4	29.6	32.0	30.7	31.4	33.4	32.3	29.9	32.0	30.9	31.4	31.8
Furans	C	33.2	50.3	33.3	51.0	34.5	53.3	35.0	53.9	33.6	53.2	32.9	52.2	32.7	50.8	32.8	50.6	32.3	48.8
Ethylamine	D	101	103	102	101	102	103	103	103	101	102	98.8	100	98.5	99.4	101	100	97.9	98.4
Acetonitrile	E	98.4	101	101	103	104	106	103	101	101	100	99.5	95.7	98.7	92.9	98.3	103	98.6	97.9
Mercury	F	245	250	250	254	255	255	247	253	245	247	244	249	246	245	244	247	247	246
Ammonia	G	203	199	201	209	203	200	204	198	202	199	201	190	201	197	201	203	200	198
Aldehyde	H	203	198	202	204	202	200	204	200	202	197	198	194	198	196	197	196	198	197
1, 3-Butadiene	I	198	198	202	202	204	200	195	198	188	190	185	191	190	193	197	193	197	201
Pyridine	J	995	1005	983	987	980	995	980	1005	970	994	965	990	970	990	975	995	955	980
Nitrosamines	K	2035	1970	2026	1985	2060	1995	2065	2000	2025	1970	2015	1950	2015	1960	2010	1970	1985	1935

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

SCOTT 7422-SC1 Cartridge (10/1/16) AN Exhauster

Volumes Air Collected (L)

Sample Box Number		Mach.	Mach.																	
Analyte	Line	Base 1	Base 2	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
SVOC	A	3.95	3.85	3.85	3.78	3.85	3.80	3.80	3.80	4.03	3.82	3.87	3.84	3.96	4.13	1.36	4.14	4.01	4.24	
VOC	B	4.10	3.81	4.45	3.74	4.11	3.92	3.67	3.88	3.81	4.12	3.64	3.82	3.67	3.60	3.54	3.57	3.72	4.25	
Furans	C	4.19	6.22	4.17	6.41	4.11	5.83	5.83	3.85	3.77	5.75	3.73	5.58	3.67	6.00	3.64	6.02	5.91	3.62	
Ethylamine	D	12.3	12.3	12.8	12.6	12.2	12.2	12.0	11.9	11.8	12.0	11.6	11.7	12.3	12.1	12.0	11.6	12.6	12.0	
Acetonitrile	E	12.4	12.7	12.7	12.4	12.0	12.4	12.4	12.1	12.1	12.2	11.6	11.6	11.6	12.4	11.5	12.3	12.2	11.5	
Mercury	F	30.0	30.2	29.9	30.7	30.3	30.4	30.2	30.5	29.5	29.9	29.0	29.3	29.6	29.6	29.7	29.7	21.3	30.3	
Ammonia	G	23.9	24.6	24.0	24.7	24.2	24.5	24.3	24.2	24.1	24.1	23.8	23.6	23.6	23.7	23.4	23.7	27.2	24.5	
Aldehyde	H	24.1	23.6	24.5	24.8	23.8	23.8	23.7	23.9	23.7	23.4	23.1	23.3	22.8	23.9	23.8	23.8	24.1	23.8	
1,3-Butadiene	I	23.7	24.2	23.7	24.4	23.7	24.2	23.3	23.7	23.6	23.2	23.4	22.9	23.5	24.2	24.0	24.0	24.1	24.2	
Pyridine	J	117	118	119	121	119	122	121	120	119	123	118	122	119	122	118	123	123	119	
Nitrosamines	K	244	240	241	239	241	242	241	242	242	241	241	239	239	239	240	238	238	242	

Flow Rates (ml/min)

Sample Box Number		Mach.	Mach.																	
Analyte	Line	Base 1	Base 2	A1	A2	B1	B2	C1	C2	D1	D2	E1	E2	F1	F2	G1	G2	H1	H2	
SVOC	A	33.0	32.1	32.1	31.5	32.1	31.7	31.7	31.7	33.6	31.8	32.3	32.0	33.0	34.4	11.3	34.5	33.2	35.0	
VOC	B	34.2	31.8	37.1	31.2	34.3	32.7	30.6	32.4	31.8	34.3	30.3	31.8	30.6	30.0	29.5	29.8	30.8	35.1	
Furans	C	34.9	51.9	34.8	53.4	34.3	48.6	48.6	32.1	31.5	47.9	31.1	46.5	30.6	50.0	30.3	50.2	48.9	29.9	
Ethylamine	D	103	102	107	105	102	102	100	98.9	98.5	100	96.3	97.5	102	101	100	96.4	104	98.8	
Acetonitrile	E	103	106	106	104	99.8	103	104	101	101	102	97.0	96.5	96.4	103	95.5	102	100	95.1	
Mercury	F	250	251	249	256	253	253	252	254	246	249	242	244	246	246	248	247	176	251	
Ammonia	G	199	205	200	206	202	204	202	201	201	201	198	196	197	198	195	198	224	202	
Aldehyde	H	201	197	204	206	199	199	198	199	198	195	193	194	190	199	198	198	199	197	
1, 3-Butadiene	I	197	202	197	203	198	202	194	197	197	193	195	191	195	202	200	200	199	200	
Pyridine	J	977	987	988	1005	993	1015	1010	999	990	1025	985	1015	990	1020	985	1025	1015	985	
Nitrosamines	K	2030	2003	2010	1990	2010	2015	2010	2020	2020	2005	2010	1990	1995	1990	2000	1985	1970	2000	

C.2.2 Temperature, Pressure, and Relative Humidity

SCOTT 7422-SD1 Cartridge (9/30/16) AN Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	66.2	72.1	80.5	65.2	60.9	72.3	70.9	77.5	83.3
Temperature	F	58.9	65.4	72.8	77.1	78.9	72.1	70.4	68.2	65.1
Pressure	Torr	734	724	722	721	720	722	721	730	741
NH3	ppm									
VOC	ppm									
Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	59.0	80.0	65.8	59.0	73.9	65.7	73.4	84.0	83.0
Temperature	F	65.6	72.4	76.2	79.0	72.1	71.5	69.8	65.2	58.9
Pressure	Torr	734	722	722	720	720	722	722	730	722
NH3	ppm		36	30	30	32	25	33	28	1.0
VOC	ppm		1.1	1.0	1.5	1.0	1.0	1.0	0.89	0.68
Effluent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	31.4	31.3	37.5	32.7	29.1	31.4	31.1	30.1	57.7
Temperature	F	59.6	64.9	72.8	77.8	79.9	76.2	71.5	69.0	65.7
Pressure	Torr	424.1	424	433	431	433	445	440	442	741
NH3	ppm									
VOC	ppm									
Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	31.2	37.8	31.2	28.1	31.8	30.5	33.7	32.6	38.1
Temperature	F	64.7	73.0	79.3	81.8	76.8	72.3	70.4	66.0	60.0
Pressure	Torr	435	441	445	448	445	444	445	445	443
NH3	ppm		0.00	1.0	0.00	0.00	1.0	2.0	2.0	0.00
VOC	ppm		0.70	0.80	1.1	0.64	1.07	0.10	0.42	0.35

SCOTT 7422-SC1 Cartridge (10/1/16) AN Exhauster

Influent- Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	72.8	74.8	79.3	68.9	71.0	68.5	68.9	72.7	70.3
Temperature	F	58.2	67.4	71.3	72.6	71.2	66.3	62.6	59.0	56.6
Pressure	Torr	734	726	725	726	726	727	727	728	726
NH3	ppm									
VOC	ppm									
Influent - Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	60.9	80.3	69.7	70.5	70.6	70.3	73.7	71.9	79.9
Temperature	F	67.4	71.4	73.1	71.6	66.6	61.8	58.7	55.8	55.0
Pressure	Torr	734	726	726	726	726	728	727	727	742
NH3	ppm		33.0	38.0	42.0	34.0	32.0	33.0	34.0	35.0
VOC	ppm		3.60	1.30	2.10	1.24	1.39	1.41	1.38	1.48
Effluent - Pre		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	28.4	24.9	36.8	35.0	34.3	31.5	35.5	35.7	34.6
Temperature	F	58.5	65.7	69.9	71.3	70.2	67.3	62.6	59.3	57.9
Pressure	Torr	430	431	439	433	432	440	430	429	425
NH3	ppm									
VOC	ppm									
Effluent- Post		After Sample Taken								
Reading	UOM	Baseline	A	B	C	D	E	F	G	H
Relative Humidity	%	25.3	38.0	36.0	34.8	32.6	34.8	37.0	36.2	61.4
Temperature	F	65.8	70.1	71.3	70.4	68.5	62.5	59.2	57.4	56.9
Pressure	Torr	445	446	448	448	448	446	443	443	740
NH3	ppm		0.00	0.00	0.00	8.0	0.00	0.00	0.00	4.0
VOC	ppm		0.90	1.0	1.1	1.6	0.00	0.58	0.41	0.32

Data points highlighted in yellow were identified by the test operator as being suspect.

C.3 Raw Analytical Data

C.3.1 SVOC and SVOTIC

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Cartridge Evaluation Data Summary Report

Sample Group: 20163069

SDG Number:

Customer Sample ID: 16-08765-1-BASE-EFF

Customer Sample ID: 16-08765-1-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035543			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035543			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035543			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035543			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035543			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035543			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035543			112-40-3	Dodecane	NGS	92	<0.60	11	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035543			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035543			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035543			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035543			629-50-5	Tridecane	NGS	89	<1.6	7.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035543			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035543			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation
Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-BASE-IN
Customer Sample ID: 16-08765-1-BASE-IN

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035544			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035544			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035544			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035544			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035544			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035544			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035544			112-40-3	Dodecane	NGS	92	<0.60	6.2	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035544			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035544			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035544			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035544			629-50-5	Tridecane	NGS	89	<1.6	4.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035544			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035544			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-BLANK1
Customer Sample ID: 16-08765-1-BLANK1

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035545			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035545			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035545			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035545			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035545			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035545			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035545			112-40-3	Dodecane	NGS	92	<0.60	0.70	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035545			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035545			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035545			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035545			629-50-5	Tridecane	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035545			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035545			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-BLANK2
Customer Sample ID: 16-08765-1-BLANK2

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035546			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035546			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035546			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035546			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035546			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035546			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035546			112-40-3	Dodecane	NGS	92	<0.60	1.4	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035546			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035546			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035546			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035546			629-50-5	Tridecane	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035546			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035546			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-B
Customer Sample ID: 16-08765-1-IN-B

Sample#	R	AW	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035547			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035547			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035547			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035547			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035547			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035547			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035547			112-40-3	Dodecane	NGS	92	<0.60	32	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035547			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035547			629-59-4	Tetradecane	NGS	100	<3.9	6.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035547			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035547			629-50-5	Tridecane	NGS	89	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035547			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035547			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-C
Customer Sample ID: 16-08765-1-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035548			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035548			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035548			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035548			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035548			78-46-5	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035548			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035548			112-40-3	Dodecane	NGS	92	<0.60	5.3	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035548			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035548			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035548			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035548			629-50-5	Tridecane	NGS	89	<1.6	3.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035548			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035548			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-D
Customer Sample ID: 16-08765-1-IN-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035549			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035549			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035549			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035549			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035549			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035549			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035549			112-40-3	Dodecane	NGS	92	<0.60	36	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035549			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035549			629-59-4	Tetradecane	NGS	100	<3.9	5.7	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035549			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035549			629-50-5	Tridecane	NGS	89	<1.6	16	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035549			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035549			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-E
Customer Sample ID: 16-08765-1-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035550			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035550			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035550			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035550			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035550			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035550			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035550			112-40-3	Dodecane	NGS	92	<0.60	17	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035550			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035550			629-59-4	Tetradecane	NGS	100	<3.9	10	n/a	n/a	n/a	n/a	3.9	n/a	
S16T035550			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035550			629-50-5	Tridecane	NGS	89	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035550			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035550			629-62-9	Pentadecane	NGS	94	<3.0	4.5	n/a	n/a	n/a	n/a	3.0	n/a	J

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-F
Customer Sample ID: 16-08765-1-IN-F

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035551			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035551			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035551			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035551			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035551			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035551			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035551			112-40-3	Dodecane	NGS	92	<0.60	41	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035551			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035551			629-59-4	Tetradecane	NGS	100	<3.9	4.3	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035551			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035551			629-50-5	Tridecane	NGS	89	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035551			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035551			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163069
SDG Number:
Customer Sample ID: 16-08765-1-IN-G
Customer Sample ID: 16-08765-1-IN-G

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035552			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035552			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035552			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035552			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035552			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035552			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035552			112-40-3	Dodecane	NGS	92	<0.60	21	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035552			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035552			629-59-4	Tetradecane	NGS	100	<3.9	3.9	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035552			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035552			629-50-5	Tridecane	NGS	89	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035552			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035552			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

James Dugan
12/1/14

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-A

Customer Sample ID: 16-08765-1-EFF-A

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035556			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035556			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035556			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035556			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035556			78-46-6	Diethyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035556			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035556			112-40-3	Dodecane	NGS	92	<0.80	13	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035556			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035556			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035556			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035556			629-50-5	Tridecane	NGS	89	<1.6	7.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035556			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035556			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
SDG Number:
Customer Sample ID: 16-08765-1-EFF-B
Customer Sample ID: 16-08765-1-EFF-B

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035557			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035557			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035557			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035557			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035557			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035557			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035557			112-40-3	Dodecane	NGS	92	<0.60	26	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035557			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035557			629-59-4	Tetradecane	NGS	100	<3.9	4.3	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035557			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035557			629-50-5	Tridecane	NGS	89	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035557			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035557			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
SDG Number:
Customer Sample ID: 16-08765-1-EFF-C
Customer Sample ID: 16-08765-1-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035558			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035558			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035558			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035558			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035558			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035558			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035558			112-40-3	Dodecane	NGS	92	<0.60	29	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035558			544-76-3	Hexadecane-	NGS	89	<3.3	3.3	n/a	n/a	n/a	n/a	3.3	n/a	J
S16T035558			629-59-4	Tetradecane	NGS	100	<3.9	5.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035558			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035558			629-50-5	Tridecane	NGS	89	<1.6	19	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035558			629-78-7	Heptadecane	NGS	120	<2.4	3.8	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T035558			629-62-9	Pentadecane	NGS	94	<3.0	5.3	n/a	n/a	n/a	n/a	3.0	n/a	J

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-D

Customer Sample ID: 16-08765-1-EFF-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVCA #2															
S16T035559			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035559			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035559			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035559			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035559			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035559			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035559			112-40-3	Dodecane	NGS	92	<0.60	13	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035559			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035559			629-59-4	Tetradecane	NGS	100	<3.9	4.0	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035559			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035559			629-50-5	Tridecane	NGS	89	<1.6	8.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035559			629-78-7	Heptadecane	NGS	120	<2.4	2.7	n/a	n/a	n/a	n/a	2.4	n/a	J
S16T035559			629-62-9	Pentadecane	NGS	94	<3.0	3.8	n/a	n/a	n/a	n/a	3.0	n/a	J

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
SDG Number:
Customer Sample ID: 16-08765-1-EFF-E
Customer Sample ID: 16-08765-1-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035560			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035560			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035560			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035560			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035560			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035560			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035560			112-40-3	Dodecane	NGS	92	<0.60	5.7	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035560			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035560			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035560			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035560			629-50-5	Tridecane	NGS	89	<1.6	3.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035560			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035560			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
SDG Number:
Customer Sample ID: 16-08765-1-EFF-F
Customer Sample ID: 16-08765-1-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035561			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035561			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035561			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035561			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035561			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035561			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035561			112-40-3	Dodecane	NGS	92	<0.60	23	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035561			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035561			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035561			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035561			629-50-5	Tridecane	NGS	89	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035561			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035561			629-62-9	Pentadecane	NGS	94	<3.0	3.2	n/a	n/a	n/a	n/a	3.0	n/a	J

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-G

Customer Sample ID: 16-08765-1-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035562			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035562			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035562			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035562			82-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035562			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035562			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035562			112-40-3	Dodecane	NGS	92	<0.60	4.4	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035562			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035562			829-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035562			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035562			829-50-5	Tridecane	NGS	89	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035562			829-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035562			829-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

NA = Not Analyzed, ND = Not Detected

N - Named TIC

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
 SDG Number:
 Customer Sample ID: 16-08765-1-EFF-H
 Customer Sample ID: 16-08765-1-EFF-H

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035563			3891-98-3	2,6,10-Trimethyldodecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035563			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035563			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035563			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035563			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035563			34-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035563			112-40-3	Dodecane	NGS	92	<0.60	12	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035563			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035563			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035563			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035563			629-50-5	Tridecane	NGS	89	<1.6	5.9	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035563			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035563			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

J - Estimated
 T - Tentatively Identified Compound
 U - Less Than Detection Limit
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 N - Named TIC

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-IN-A

Customer Sample ID: 16-08765-1-IN-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035564			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035564			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035564			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035564			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035564			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035564			84-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035564			112-40-3	Dodecane	NGS	92	<0.60	20	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035564			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035564			629-59-4	Tetradecane	NGS	100	<3.9	4.2	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035564			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035564			629-50-5	Tridecane	NGS	89	<1.6	17	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035564			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035564			629-62-9	Pentadecane	NGS	94	<3.0	3.3	n/a	n/a	n/a	n/a	3.0	n/a	J

J - Estimated

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U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070
SDG Number:
Customer Sample ID: 16-08765-1-IN-H
Customer Sample ID: 16-08765-1-IN-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035565			3891-98-3	2,6,10-Trimethyldecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035565			95-48-7	2-Methylphenol	NGS	89	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035565			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035565			92-52-4	Biphenyl	NGS	110	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035565			78-46-6	Dibutyl butylphosphonate	NGS	100	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035565			94-66-2	Diethylphthalate	NGS	100	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035565			112-40-3	Dodecane	NGS	92	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035565			544-76-3	Hexadecane-	NGS	89	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035565			629-59-4	Tetradecane	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035565			126-73-8	Tributyl phosphate	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035565			629-50-5	Tridecane	NGS	89	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035565			629-78-7	Heptadecane	NGS	120	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035565			629-62-9	Pentadecane	NGS	94	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

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

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Opportunity
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Cartridge Evaluation Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-A

Customer Sample ID: 16-08765-1-EFF-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035556				Cyclotrisiloxane, hexamethyl-	541-05-9	2.84	NGS	39	JNT
S16T035556				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	40	JNT
S16T035556				Cyclohexene, 1-methyl-4-(1-met	7705-14-8	4.84	NGS	43	JNT
S16T035556				Decane, 2,4,6-trimethyl-	82108-27-4	5.04	NGS	10	JNT
S16T035556				Undecane	1120-21-4	5.43	NGS	16	JNT
S16T035556				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	51	JNT
S16T035556				1,2-Benzisothiazole	272-16-2	6.58	NGS	28	JNT
S16T035556				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.88	NGS	17	JNT
S16T035556				Undecane, 2-methyl-	7045-71-8	7.25	NGS	17	JNT
S16T035556				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.17	NGS	37	JNT
S16T035556			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035556			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

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U - Less Than Detection Limit

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

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-B

Customer Sample ID: 16-08765-1-EFF-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035557				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	48	JNT
S16T035557				Cyclohexene, 1-methyl-5-(1-met	1461-27-4	4.84	NGS	77	JNT
S16T035557				2,6-Dimethyldecane	13150-81-7	5.04	NGS	47	JNT
S16T035557				Decane, 2,4,6-trimethyl-	62108-27-4	5.20	NGS	24	JNT
S16T035557				Decane, 2,6,7-trimethyl-	62108-25-2	5.32	NGS	40	JNT
S16T035557				Undecane	1120-21-4	5.44	NGS	77	JNT
S16T035557				Hydroxylamine, O-decyl-	29812-79-1	5.49	NGS	38	JNT
S16T035557				Undecane, 2,6-dimethyl-	17301-23-4	5.57	NGS	22	JNT
S16T035557				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	59	JNT
S16T035557				1,2-Benzisothiazole	272-16-2	6.59	NGS	51	JNT
S16T035557				Dodecane, 2,7,10-trimethyl-	74645-98-0	6.89	NGS	32	JNT
S16T035557				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.25	NGS	34	JNT
S16T035557				Undecane, 2-methyl-	7045-71-8	7.32	NGS	13	JNT
S16T035557			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035557			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-C

Customer Sample ID: 16-08765-1-EFF-C

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035558				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	34	JNT
S16T035558				D-Limonene	5989-27-5	4.84	NGS	44	JNT
S16T035558				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	11	JNT
S16T035558				Acetophenone	98-86-2	5.18	NGS	5.7	JNT
S16T035558				Undecane	1120-21-4	5.44	NGS	27	JNT
S16T035558				Nonanal	124-19-6	5.49	NGS	27	JNT
S16T035558				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	63	JNT
S16T035558				1,2-Benzisothiazole	272-16-2	6.59	NGS	45	JNT
S16T035558				Dodecane, 2,7,10-trimethyl-	74645-98-0	6.89	NGS	25	JNT
S16T035558				1-Iodo-2-methylundecane	73105-67-6	7.25	NGS	27	JNT
S16T035558				Undecane, 3,7-dimethyl-	17301-29-0	7.32	NGS	9.6	JNT
S16T035558				Dodecane, 2,6,11-trimethyl-	31295-56-4	7.39	NGS	7.0	JNT
S16T035558				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.17	NGS	36	JNT
S16T035558			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035558			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-D

Customer Sample ID: 16-08765-1-EFF-D

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035559				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	29	JNT
S16T035559				D-Limonene	5989-27-5	4.84	NGS	47	JNT
S16T035559				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	10	JNT
S16T035559				Acetophenone	98-86-2	5.18	NGS	5.5	JNT
S16T035559				Undecane	1120-21-4	5.44	NGS	23	JNT
S16T035559				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	49	JNT
S16T035559				1,2-Benzisothiazole	272-16-2	6.58	NGS	30	JNT
S16T035559				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.89	NGS	17	JNT
S16T035559				Undecane, 2-methyl-	7045-71-8	7.25	NGS	19	JNT
S16T035559				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.17	NGS	30	JNT
S16T035559			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035559			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

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Cartridge Evaluation Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-E

Customer Sample ID: 16-08765-1-EFF-E

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035560				Undecane	1120-21-4	5.43	NGS	9.4	JNT
S16T035560				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	26	JNT
S16T035560				Undecane, 2,6-dimethyl-	17301-23-4	6.28	NGS	5.6	JNT
S16T035560				Decane, 2,4,6-trimethyl-	62108-27-4	6.88	NGS	7.1	JNT
S16T035560				Undecane, 2-methyl-	7045-71-8	7.24	NGS	7.4	JNT
S16T035560			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035560			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-F

Customer Sample ID: 16-08765-1-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035561				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	25	JNT
S16T035561				D-Limonene	5989-27-5	4.84	NGS	36	JNT
S16T035561				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	11	JNT
S16T035561				Undecane	1120-21-4	5.44	NGS	28	JNT
S16T035561				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	48	JNT
S16T035561				1,2-Benzisothiazole	272-16-2	6.59	NGS	35	JNT
S16T035561				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.88	NGS	18	JNT
S16T035561				Undecane, 2-methyl-	7045-71-8	7.25	NGS	15	JNT
S16T035561			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035561			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-G

Customer Sample ID: 16-08765-1-EFF-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035562				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	25	JNT
S16T035562				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	41	JNT
S16T035562				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	23	JNT
S16T035562				Undecane	1120-21-4	5.44	NGS	24	JNT
S16T035562				Undecane, 2,6-dimethyl-	17301-23-4	5.48	NGS	9.1	JNT
S16T035562			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035562			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-EFF-H

Customer Sample ID: 16-08765-1-EFF-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035563				D-Limonene	5989-27-5	4.84	NGS	25	JNT
S16T035563				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	7.5	JNT
S16T035563				Undecane	1120-21-4	5.44	NGS	16	JNT
S16T035563				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	30	JNT
S16T035563				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.88	NGS	11	JNT
S16T035563			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035563			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-IN-A

Customer Sample ID: 16-08765-1-IN-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035564				2-Butoxyethanol	111-76-2	3.69	NGS	7.2	JNT
S16T035564				Cyclotetrasiloxane, octamethyl	556-67-2	4.34	NGS	29	JNT
S16T035564				D-Limonene	5989-27-5	4.84	NGS	32	JNT
S16T035564				Decane, 2,4,6-trimethyl-	62108-27-4	5.19	NGS	6.5	JNT
S16T035564				Undecane	1120-21-4	5.44	NGS	24	JNT
S16T035564				Decamethylcyclopentasiloxane	541-02-6	5.70	NGS	50	JNT
S16T035564				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.88	NGS	15	JNT
S16T035564				Undecane, 2-methyl-	7045-71-8	7.25	NGS	13	JNT
S16T035564				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.17	NGS	60	JNT
S16T035564			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035564			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163070

SDG Number:

Customer Sample ID: 16-08765-1-IN-H

Customer Sample ID: 16-08765-1-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035565				D-Limonene	5989-27-5	4.84	NGS	32	JNT
S16T035565				Decane, 2,4,6-trimethyl-	62108-27-4	5.04	NGS	6.0	JNT
S16T035565				Undecane	1120-21-4	5.44	NGS	17	JNT
S16T035565				Undecane, 2-methyl-	7045-71-8	7.25	NGS	12	JNT
S16T035565			BLNK	Chrysene-D12	1719-03-5	14.03	NGS	24	
S16T035565			BLNK	Perylene-D12	1520-96-3	15.79	NGS	4.2	

J - Estimated

T - Tentatively Identified Compound

U - Less Than Detection Limit

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

Cartridge Evaluation
Data Summary Report

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Sample Group: 20163071

SDG Number:

Customer Sample ID: 16-08766-1-BASE-EFF

Customer Sample ID: 16-08766-1-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035566			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035566			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035566			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035566			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035566			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035566			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035566			112-40-3	Dodecane	NGS	93	<0.60	12	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035566			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035566			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035566			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035566			629-50-5	Tridecane	NGS	93	<1.6	7.4	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035566			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035566			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation
Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-BASE-IN
Customer Sample ID: 16-08766-1-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035567			3891-98-3	2,6,10-Trimethyldodecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035567			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035567			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035567			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035567			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035567			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035567			112-40-3	Dodecane	NGS	93	<0.60	6.7	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035567			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035567			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035567			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035567			629-50-5	Tridecane	NGS	93	<1.6	5.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035567			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035567			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-BLANK-EFF
Customer Sample ID: 16-08766-1-BLANK-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035568			3891-98-3	2,6,10-Trimethyldodecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035568			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T035568			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035568			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T035568			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T035568			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T035568			112-40-3	Dodecane	NGS	93	<0.60	0.80	n/a	n/a	n/a	n/a	0.55		n/a J
S16T035568			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T035568			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035568			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035568			629-50-5	Tridecane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035568			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035568			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-BLANK-IN
Customer Sample ID: 16-08766-1-BLANK-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035569			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035569			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035569			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035569			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035569			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035569			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035569			112-40-3	Dodecane	NGS	93	<0.60	<0.60	n/a	n/a	n/a	n/a	0.60	n/a	U
S16T035569			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035569			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035569			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035569			629-50-5	Tridecane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035569			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035569			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163071

SDG Number:

Customer Sample ID: 16-08766-1-IN-B

Customer Sample ID: 16-08766-1-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035570			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035570			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035570			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035570			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035570			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035570			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035570			112-40-3	Dodecane	NGS	93	<0.60	13	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035570			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035570			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035570			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035570			629-50-5	Tridecane	NGS	93	<1.6	5.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035570			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035570			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-IN-C
Customer Sample ID: 16-08766-1-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035571			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035571			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035571			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035571			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035571			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035571			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035571			112-40-3	Dodecane	NGS	93	<0.60	16	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035571			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035571			629-59-4	Tetradecane	NGS	91	<3.9	8.4	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035571			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035571			629-50-5	Tridecane	NGS	93	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035571			629-76-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035571			629-62-9	Pentadecane	NGS	91	<3.0	3.5	n/a	n/a	n/a	n/a	3.0	n/a	J

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation
Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-IN-D
Customer Sample ID: 16-08766-1-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035572			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035572			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035572			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035572			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035572			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035572			84-86-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035572			112-40-3	Dodecane	NGS	93	<0.60	29	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035572			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035572			629-59-4	Tetradecane	NGS	91	<3.9	4.6	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035572			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035572			629-50-5	Tridecane	NGS	93	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035572			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035572			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163071

SDG Number:

Customer Sample ID: 16-08766-1-IN-E

Customer Sample ID: 16-08766-1-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035573			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035573			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T035573			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035573			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T035573			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T035573			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T035573			112-40-3	Dodecane	NGS	93	<0.60	11	n/a	n/a	n/a	n/a	0.55		n/a
S16T035573			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T035573			629-59-4	Tetradecane	NGS	91	<3.9	5.8	n/a	n/a	n/a	n/a	3.9		n/a J
S16T035573			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035573			629-50-5	Tridecane	NGS	93	<1.6	6.0	n/a	n/a	n/a	n/a	1.6		n/a J
S16T035573			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035573			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0		n/a U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163071
SDG Number:
Customer Sample ID: 16-08766-1-IN-F
Customer Sample ID: 16-08766-1-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035574			3891-98-3	2,6,10-Trimethyldecane	NGS	90	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035574			95-48-7	2-Methylphenol	NGS	120	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035574			108-39-4M	Cresol (m & p)	NGS	120	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035574			92-52-4	Biphenyl	NGS	92	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035574			78-46-6	Dibutyl butylphosphonate	NGS	92	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035574			84-66-2	Diethylphthalate	NGS	90	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	U
S16T035574			112-40-3	Dodecane	NGS	93	<0.60	24	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035574			544-76-3	Hexadecane-	NGS	83	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035574			629-59-4	Tetradecane	NGS	91	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035574			126-73-8	Tributyl phosphate	NGS	96	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035574			629-50-5	Tridecane	NGS	83	<1.6	7.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035574			629-78-7	Heptadecane	NGS	85	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035574			629-62-9	Pentadecane	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

James Jung
12/8/16

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-A

Customer Sample ID: 16-08766-1-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035576			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U
S16T035576			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	n/a	4.9	n/a U
S16T035576			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T035576			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	n/a	4.0	n/a U
S16T035576			76-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	n/a	3.6	n/a U
S16T035576			84-86-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	n/a	7.0	n/a U
S16T035576			112-40-3	Dodecane	NGS	100	<0.60	10	n/a	n/a	n/a	n/a	n/a	0.55	n/a
S16T035576			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	3.3	n/a U
S16T035576			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	n/a	3.9	n/a U
S16T035576			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	n/a	5.6	n/a U
S16T035576			629-50-5	Tridecane	NGS	98	<1.6	6.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035576			629-76-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	n/a	2.4	n/a U
S16T035576			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	3.0	n/a U

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

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-B

Customer Sample ID: 16-08766-1-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035577			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035577			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T035577			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035577			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T035577			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T035577			84-86-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a U
S16T035577			112-40-3	Dodecane	NGS	100	<0.60	17	n/a	n/a	n/a	n/a	0.55		n/a
S16T035577			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T035577			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035577			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035577			629-50-5	Tridecane	NGS	98	<1.6	9.7	n/a	n/a	n/a	n/a	1.6		n/a J
S16T035577			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035577			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-C

Customer Sample ID: 16-08766-1-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035578			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035578			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035578			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035578			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035578			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035578			84-66-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035578			112-40-3	Dodecane	NGS	100	<0.60	19	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035578			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035578			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035578			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035578			629-50-5	Tridecane	NGS	98	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035578			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035578			629-62-9	Pentadecane	NGS	120	<3.0	3.4	n/a	n/a	n/a	n/a	3.0	n/a	J

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-E

Customer Sample ID: 16-08766-1-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035580			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035580			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9		n/a U
S16T035580			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035580			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0		n/a U
S16T035580			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6		n/a U
S16T035580			84-56-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0		n/a Uc
S16T035580			112-40-3	Dodecane	NGS	100	<0.60	7.8	n/a	n/a	n/a	n/a	0.55		n/a J
S16T035580			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T035580			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035580			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035580			629-50-5	Tridecane	NGS	98	<1.6	5.2	n/a	n/a	n/a	n/a	1.6		n/a J
S16T035580			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035580			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-F

Customer Sample ID: 16-08766-1-EFF-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035581			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035581			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035581			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035581			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035581			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035581			84-66-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035581			112-40-3	Dodecane	NGS	100	<0.60	12	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035581			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035581			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035581			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035581			629-50-5	Tridecane	NGS	98	<1.6	6.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035581			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035581			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-G

Customer Sample ID: 16-08766-1-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035582			3891-98-3	2,6,10-Trimethyldecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035582			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035582			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035582			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035582			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035582			84-86-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035582			112-40-3	Dodecane	NGS	100	<0.60	20	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035582			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035582			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035582			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035582			629-50-5	Tridecane	NGS	98	<1.6	3.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035582			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035582			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-H

Customer Sample ID: 16-08766-1-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035583			3891-98-3	2,6,10-Trimethyldodecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035583			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035583			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035583			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035583			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035583			84-66-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035583			112-40-3	Dodecane	NGS	100	<0.60	7.7	n/a	n/a	n/a	n/a	0.55	n/a	J
S16T035583			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035583			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035583			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035583			629-50-5	Tridecane	NGS	98	<1.6	3.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035583			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035583			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-IN-A

Customer Sample ID: 16-08766-1-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035584			3891-98-3	2,6,10-Trimethyldodecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035584			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035584			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035584			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035584			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035584			84-66-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035584			112-40-3	Dodecane	NGS	100	<0.60	18	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035584			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035584			629-59-4	Tetradecane	NGS	130	<3.9	4.5	n/a	n/a	n/a	n/a	3.9	n/a	J
S16T035584			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035584			629-50-5	Tridecane	NGS	98	<1.6	20	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035584			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035584			629-62-9	Pentadecane	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-IN-H

Customer Sample ID: 16-08766-1-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU SVOA #2															
S16T035585			3891-98-3	2,6,10-Trimethyldodecane	NGS	120	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035585			95-48-7	2-Methylphenol	NGS	110	<4.9	<4.9	n/a	n/a	n/a	n/a	4.9	n/a	U
S16T035585			108-39-4M	Cresol (m & p)	NGS	100	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035585			92-52-4	Biphenyl	NGS	120	<4.0	<4.0	n/a	n/a	n/a	n/a	4.0	n/a	U
S16T035585			78-46-6	Dibutyl butylphosphonate	NGS	120	<3.6	<3.6	n/a	n/a	n/a	n/a	3.6	n/a	U
S16T035585			84-66-2	Diethylphthalate	NGS	130	<7.0	<7.0	n/a	n/a	n/a	n/a	7.0	n/a	Uc
S16T035585			112-40-3	Dodecane	NGS	100	<0.60	16	n/a	n/a	n/a	n/a	0.55	n/a	
S16T035585			544-76-3	Hexadecane-	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035585			629-59-4	Tetradecane	NGS	130	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035585			126-73-8	Tributyl phosphate	NGS	110	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035585			629-50-5	Tridecane	NGS	98	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035585			629-78-7	Heptadecane	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035585			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
T - Tentatively Identified Compound

J - Estimated

c - RPD Outside Range

N - Named TIC
U - Less Than Detection Limit

John Dwyer
12/8/14

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-A

Customer Sample ID: 16-08766-1-EFF-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035576				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	29 JNT	
S16T035576				Cyclotetrasiloxane, octamethyl	556-67-2	4.35	NGS	26 JNT	
S16T035576				D-Limonene	5989-27-5	4.85	NGS	26 JNT	
S16T035576				Undecane, 2,6-dimethyl-	17301-23-4	5.45	NGS	15 JNT	
S16T035576				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	42 JNT	

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-B

Customer Sample ID: 16-08766-1-EFF-B

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035577				Cyclotrisiloxane, hexamethyl-	541-05-9	2.85	NGS	28	JNT
S16T035577				Cyclotetrasiloxane, octamethyl	556-87-2	4.35	NGS	34	JNT
S16T035577				D-Limonene	5989-27-5	4.85	NGS	28	JNT
S16T035577				Undecane	1120-21-4	5.45	NGS	22	JNT
S16T035577				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	44	JNT

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-C

Customer Sample ID: 16-08766-1-EFF-C

Sample#	R	AS	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035578				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	38	JNT
S16T035578				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	35	JNT
S16T035578				D-Limonene	5989-27-5	4.85	NGS	26	JNT
S16T035578				Undecane, 2,6-dimethyl-	17301-23-4	5.21	NGS	8.9	JNT
S16T035578				Undecane	1120-21-4	5.45	NGS	31	JNT
S16T035578				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	47	JNT
S16T035578				1,2-Benzisothiazole	272-16-2	6.60	NGS	27	JNT
S16T035578				Dodecane, 2,6,11-trimethyl-	31295-56-4	6.90	NGS	16	JNT

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-E

Customer Sample ID: 16-08766-1-EFF-E

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035580				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	50 JNT	
S16T035580				Undecane	1120-21-4	5.45	NGS	9.5 JNT	
S16T035580				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	30 JNT	

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-F

Customer Sample ID: 16-08766-1-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035581				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	43 JNT	
S16T035581				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	30 JNT	
S16T035581				Undecane	1120-21-4	5.45	NGS	13 JNT	
S16T035581				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	30 JNT	

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-G

Customer Sample ID: 16-08766-1-EFF-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035582				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	32	JNT
S16T035582				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	47	JNT
S16T035582				D-Limonene	5989-27-5	4.86	NGS	26	JNT
S16T035582				Undecane, 4,7-dimethyl-	17301-32-5	5.06	NGS	52	JNT
S16T035582				Decane, 2,4,6-trimethyl-	62108-27-4	5.10	NGS	23	JNT
S16T035582				Undecane	1120-21-4	5.46	NGS	59	JNT
S16T035582				Decamethylcyclopentasiloxane	541-02-6	5.72	NGS	40	JNT

N - Named TIC

U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-EFF-H

Customer Sample ID: 16-08766-1-EFF-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035583				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	52 JNT	
S16T035583				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	26 JNT	
S16T035583				Undecane	1120-21-4	5.45	NGS	14 JNT	

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-IN-A

Customer Sample ID: 16-08766-1-IN-A

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035584				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	48 JNT	
S16T035584				Cyclotetrasiloxane, octamethyl	556-87-2	4.36	NGS	42 JNT	
S16T035584				D-Limonene	5989-27-5	4.85	NGS	30 JNT	
S16T035584				Undecane	1120-21-4	5.45	NGS	19 JNT	
S16T035584				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	41 JNT	
S16T035584				Propanoic acid, 2-methyl-, 1-(	74381-40-1	9.19	NGS	29 JNT	

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163072

SDG Number:

Customer Sample ID: 16-08766-1-IN-H

Customer Sample ID: 16-08766-1-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU SVOA #2									
S16T035585				Cyclotrisiloxane, hexamethyl-	541-05-9	2.86	NGS	43	JNT
S16T035585				Cyclotetrasiloxane, octamethyl	556-67-2	4.36	NGS	37	JNT
S16T035585				Undecane	1120-21-4	5.45	NGS	16	JNT
S16T035585				Decamethylcyclopentasiloxane	541-02-6	5.71	NGS	30	JNT

N - Named TIC
U - Less Than Detection Limit

c - RPD Outside Range

J - Estimated

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

Cartridge Evaluation
Data Summary Report

Spencer
12/12/14

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-BASE-EFF

Customer Sample ID: 16-08766-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035518		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035518		79-00-5		1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518		75-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035518		75-35-4		1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035518		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
S16T035518		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035518		106-46-7		1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035518		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
S16T035518		71-36-3		1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035518		111-70-6		1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035518		71-23-8		1-Propanol	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035518		108-47-4		2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035518		1708-29-8		2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035518		78-93-3		2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035518		110-43-0		2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518		591-78-6		2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035518		534-22-5		2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035518		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
S16T035518		106-35-4		3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518		106-88-3		3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035518		105-42-0		4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035518		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
S16T035518		67-64-1		Acetone	NGS	81	<4.3	13	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035518		75-05-8		Acetonitrile	NGS	81	<1.8	63	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035518		98-86-2		Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035518		107-13-1		Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035518		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035518		107-05-1		Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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C.3.2 VOC and VOCTIC

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BASE-EFF
Customer Sample ID: 16-08766-2-BASE-EFF

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035518			71-43-2	Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035518			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035518			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035518			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035518			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035518			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035518			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035518			64-17-5	Ethanol	NGS	100	<7.4	15	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035518			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			110-00-9	Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518			110-54-3	Hexane	NGS	85	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035518			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518			75-09-2	Methylene Chloride	NGS	90	<2.7	4.9	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035518			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035518			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035518			110-59-8	Nitrobenzotrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518			107-12-0	Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035518			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035518			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035518			127-18-4	Tetrachloroethene	NGS	99	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035518			108-88-3	Toluene	NGS	85	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035518			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035518			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BASE-EFF
Customer Sample ID: 16-08766-2-BASE-EFF

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035518			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
S16T035518			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035518			142-82-5	n-Heptane	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035518			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BASE-IN
Customer Sample ID: 16-08766-2-BASE-IN

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Roc %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035519		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035519		79-00-5		1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519		75-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035519		75-35-4		1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035519		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
S16T035519		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035519		108-46-7		1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035519		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
S16T035519		71-36-3		1-Butanol	NGS	140	<8.9	24	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035519		111-70-6		1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035519		71-23-8		1-Propanol	NGS	120	<3.0	20	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035519		108-47-4		2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035519		1708-29-8		2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035519		78-93-3		2-Butanone	NGS	94	<1.9	2.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035519		110-43-0		2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035519		591-78-6		2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035519		534-22-5		2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035519		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
S16T035519		106-35-4		3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519		106-68-3		3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035519		105-42-0		4-Methyl-2-hexanone	NGS	85	<1.3	2.9	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T035519		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
S16T035519		67-64-1		Acetone	NGS	81	<4.3	26	n/a	n/a	n/a	n/a	4.3	n/a	*
S16T035519		75-05-8		Acetonitrile	NGS	81	<1.8	36	n/a	n/a	n/a	n/a	1.8	n/a	a
S16T035519		98-86-2		Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035519		107-13-1		Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035519		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035519		107-05-1		Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BASE-IN
Customer Sample ID: 16-08766-2-BASE-IN

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035519			71-43-2	Benzene	NGS	90	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035519			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035519			123-72-8	Butanal	NGS	100	<2.1	2.3	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035519			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035519			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035519			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035519			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035519			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035519			64-17-5	Ethanol	NGS	100	<7.4	13	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035519			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			110-00-9	Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035519			110-54-3	Hexane	NGS	85	<1.7	2.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035519			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			126-98-7	Methacrylonitrile	NGS	97	<1.6	1.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035519			75-09-2	Methylene Chloride	NGS	90	<2.7	4.1	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035519			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035519			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035519			110-59-8	Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035519			107-12-0	Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035519			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035519			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035519			127-18-4	Tetrachloroethene	NGS	99	<1.6	8.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035519			108-88-3	Toluene	NGS	85	<1.5	3.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035519			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035519			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	5.1	n/a	n/a	n/a	n/a	1.6	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BASE-IN
Customer Sample ID: 16-08766-2-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035519			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
S16T035519			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035519			142-82-5	n-Heptane	NGS	84	<1.4	2.8	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035519			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
Q - Qualitative

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L - LLS Outside Range

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BLANK-EFF
Customer Sample ID: 16-08766-2-BLANK-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035520		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035520		79-00-5		1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		75-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035520		75-35-4		1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035520		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
S16T035520		542-75-6		1,3-Dichloropropene (Total)	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035520		108-46-7		1,4-Dichlorobenzene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035520		123-91-1		1,4-Dioxane	NGS	140	<8.9	13	n/a	n/a	n/a	n/a	8.9	n/a	Ja
S16T035520		71-36-3		1-Butanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035520		111-70-9		1-Heptanol	NGS	120	<3.0	28	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035520		71-23-8		1-Propanol	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035520		108-47-4		2,4-Dimethylpyridine	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035520		1708-29-8		2,5-Dihydrofuran	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035520		78-93-3		2-Butanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		110-43-0		2-Heptanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035520		591-78-6		2-Hexanone	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035520		534-22-5		2-Methylfuran	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035520		78-94-4		3-Buten-2-one	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		106-35-4		3-Heptanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035520		106-68-3		3-Octanone	NGS	85	<1.3	2.7	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T035520		105-42-0		4-Methyl-2-hexanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035520		108-10-1		4-Methyl-2-Pentanone	NGS	81	<4.3	24	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035520		67-64-1		Acetone	NGS	81	<1.8	690	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T035520		75-05-8		Acetonitrile	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035520		98-86-2		Acetophenone	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035520		107-13-1		Acrylonitrile	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035520		107-18-6		Allyl Alcohol	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035520		107-05-1		Allyl Chloride	NGS										

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-BLANK-EFF

Customer Sample ID: 16-08766-2-BLANK-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035520		71-43-2		Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035520		100-47-0		Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035520		123-72-8		Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035520		109-74-0		Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035520		56-23-5		Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		108-90-7		Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		75-00-3		Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035520		87-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		110-82-7		Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035520		124-18-5		Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035520		84-17-5		Ethanol	NGS	100	<7.4	21	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035520		141-78-6		Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		100-41-4		Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		110-00-9		Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		110-54-3		Hexane	NGS	85	<1.7	2.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035520		628-73-9		Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		126-98-7		Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		75-09-2		Methylene Chloride	NGS	90	<2.7	6.2	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035520		91-20-3		Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035520		98-95-3		Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035520		110-59-8		Pentanenitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		107-12-0		Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035520		110-86-1		Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035520		100-42-5		Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		127-18-4		Tetrachloroethene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035520		108-88-3		Toluene	NGS	85	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035520		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035520		75-69-4		Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BLANK-EFF
Customer Sample ID: 16-08766-2-BLANK-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035520			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035520			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035520			142-82-5	n-Heptane	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035520			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-BLANK-IN

Customer Sample ID: 16-08766-2-BLANK-IN

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035521			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035521			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	n/a U
S16T035521			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T035521			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035521			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T035521			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T035521			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T035521			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T035521			71-36-3	1-Butanol	NGS	140	<8.9	47	n/a	n/a	n/a	n/a	8.9	n/a	n/a a
S16T035521			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a LU
S16T035521			71-23-8	1-Propanol	NGS	120	<3.0	22	n/a	n/a	n/a	n/a	3.0	n/a	n/a J
S16T035521			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T035521			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T035521			78-93-3	2-Butanone	NGS	94	<1.9	2.1	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T035521			110-43-0	2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T035521			591-78-6	2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T035521			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T035521			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	n/a U
S16T035521			106-35-4	3-Heptanone	NGS	88	<1.5	4.0	n/a	n/a	n/a	n/a	1.5	n/a	n/a J
S16T035521			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T035521			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035521			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	n/a U
S16T035521			57-64-1	Acetone	NGS	81	<4.3	36	n/a	n/a	n/a	n/a	4.3	n/a	n/a
S16T035521			75-05-8	Acetonitrile	NGS	81	<1.8	86	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T035521			98-86-2	Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	n/a U
S16T035521			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T035521			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U
S16T035521			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BLANK-IN
Customer Sample ID: 16-08766-2-BLANK-IN

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035521			71-43-2	Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035521			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035521			123-72-8	Butanal	NGS	100	<2.1	2.1	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035521			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035521			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035521			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035521			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035521			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035521			64-17-5	Ethanol	NGS	100	<7.4	26	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035521			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			110-00-9	Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035521			110-54-3	Hexane	NGS	85	<1.7	2.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035521			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035521			75-09-2	Methylene Chloride	NGS	90	<2.7	9.6	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035521			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035521			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035521			110-59-8	Pentanitrile	NGS	86	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035521			107-12-0	Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035521			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035521			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035521			127-18-4	Tetrachloroethene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035521			108-88-3	Toluene	NGS	85	<1.5	5.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035521			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035521			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

J - Estimated
Q - Qualitative
U - Less Than Detection Limit
E - Outside Calibration Range
L - LLS Outside Range
a - LCS Outside Range
NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-BLANK-IN
Customer Sample ID: 16-08766-2-BLANK-IN

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035521			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
S16T035521			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035521			142-82-5	n-Heptane	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035521			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-B

Customer Sample ID: 16-08766-2-IN-B

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035522			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035522			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU
S16T035522			75-35-4	1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035522			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035522			542-75-6	1,3-Dichloropropene (Total)	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035522			106-46-7	1,4-Dichlorobenzene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T035522			123-91-1	1,4-Dioxane	NGS	140	<8.9	110	n/a	n/a	n/a	n/a	8.9	n/a	Qa
S16T035522			71-36-3	1-Butanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LQU
S16T035522			111-70-6	1-Heptanol	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	QU
S16T035522			71-23-8	1-Propanol	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	QU
S16T035522			108-47-4	2,4-Dimethylpyridine	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T035522			1708-29-8	2,5-Dihydrofuran	NGS	94	<1.9	5.7	n/a	n/a	n/a	n/a	1.9	n/a	JQ
S16T035522			78-93-3	2-Butanone	NGS	86	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	JQ
S16T035522			110-43-0	2-Heptanone	NGS	85	<1.2	2.6	n/a	n/a	n/a	n/a	1.2	n/a	JQ
S16T035522			591-78-6	2-Hexanone	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035522			534-22-5	2-Methylfuran	NGS	89	<1.7	9.1	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T035522			78-94-4	3-Buten-2-one	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			106-35-4	3-Heptanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	QU
S16T035522			106-68-3	3-Octanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035522			105-42-0	4-Methyl-2-hexanone	NGS	96	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035522			108-10-1	4-Methyl-2-Pentanone	NGS	81	<4.3	35	n/a	n/a	n/a	n/a	4.3	n/a	Q
S16T035522			67-64-1	Acetone	NGS	81	<1.8	1.6E+03	n/a	n/a	n/a	n/a	1.8	n/a	EQ
S16T035522			75-05-8	Acetonitrile	NGS	89	<2.6	7.2	n/a	n/a	n/a	n/a	2.6	n/a	JQ
S16T035522			98-86-2	Acetophenone	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T035522			107-13-1	Acrylonitrile	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	QU
S16T035522			107-18-6	Allyl Alcohol	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T035522			107-05-1	Allyl Chloride	NGS										

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-B
Customer Sample ID: 16-08766-2-IN-B

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035522			71-43-2	Benzene	NGS	90	<1.2	3.9	n/a	n/a	n/a	n/a	1.2	n/a	JQ
S16T035522			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035522			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	QU
S16T035522			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU
S16T035522			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035522			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035522			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	QU
S16T035522			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T035522			64-17-5	Ethanol	NGS	100	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	QU
S16T035522			141-78-6	Ethyl acetate	NGS	81	<1.5	57	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			110-00-9	Furan	NGS	86	<1.6	4.0	n/a	n/a	n/a	n/a	1.6	n/a	JQ
S16T035522			110-54-3	Hexane	NGS	85	<1.7	20	n/a	n/a	n/a	n/a	1.7	n/a	Q
S16T035522			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			126-98-7	Methacrylonitrile	NGS	97	<1.6	3.0	n/a	n/a	n/a	n/a	1.6	n/a	JQ
S16T035522			75-09-2	Methylene Chloride	NGS	90	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	QU
S16T035522			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	QU
S16T035522			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	QU
S16T035522			110-59-8	Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035522			107-12-0	Propanenitrile	NGS	95	<1.4	1.9	n/a	n/a	n/a	n/a	1.4	n/a	JQ
S16T035522			110-86-1	Pyridine	NGS	130	<3.8	5.8	n/a	n/a	n/a	n/a	3.8	n/a	JQ
S16T035522			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035522			127-18-4	Tetrachloroethene	NGS	99	<1.6	4.8	n/a	n/a	n/a	n/a	1.6	n/a	JQ
S16T035522			108-88-3	Toluene	NGS	85	<1.5	3.8	n/a	n/a	n/a	n/a	1.5	n/a	JQ
S16T035522			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035522			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU

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NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-B
Customer Sample ID: 16-08766-2-IN-B

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035522			10061-01-5	cis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035522			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	QU
S16T035522			142-82-5	n-Heptane	NGS	84	<1.4	17	n/a	n/a	n/a	n/a	1.4	n/a	Q
S16T035522			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU

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L - LLS Outside Range

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

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-C
Customer Sample ID: 16-08766-2-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035523			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035523			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035523			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035523			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
S16T035523			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
S16T035523			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035523			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
S16T035523			71-36-3	1-Butanol	NGS	140	<8.9	300	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035523			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035523			71-23-8	1-Propanol	NGS	120	<3.0	28	n/a	n/a	n/a	n/a	3.0	n/a	
S16T035523			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035523			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035523			78-93-3	2-Butanone	NGS	94	<1.9	8.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035523			110-43-0	2-Heptanone	NGS	86	<1.6	3.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035523			591-78-6	2-Hexanone	NGS	85	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035523			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035523			78-94-4	3-Buten-2-one	NGS	89	<1.7	3.5	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035523			106-35-4	3-Heptanone	NGS	88	<1.5	2.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035523			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035523			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035523			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	4.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035523			67-64-1	Acetone	NGS	81	<4.3	49	n/a	n/a	n/a	n/a	4.3	n/a	
S16T035523			75-05-8	Acetonitrile	NGS	81	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035523			98-86-2	Acetophenone	NGS	89	<2.6	3.1	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035523			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035523			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035523			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-C

Customer Sample ID: 16-08766-2-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035523			71-43-2	Benzene	NGS	90	<1.2	2.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035523			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035523			123-72-8	Butanal	NGS	100	<2.1	4.8	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035523			109-74-0	Butanenitrile	NGS	97	<1.2	1.7	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035523			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035523			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035523			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035523			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035523			64-17-5	Ethanol	NGS	100	<7.4	140	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035523			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			110-00-9	Furan	NGS	86	<1.6	7.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035523			110-54-3	Hexane	NGS	85	<1.7	21	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035523			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035523			75-09-2	Methylene Chloride	NGS	90	<2.7	5.2	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035523			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035523			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035523			110-59-8	Pentanitrile	NGS	86	<1.6	5.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035523			107-12-0	Propanenitrile	NGS	95	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035523			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035523			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035523			127-18-4	Tetrachloroethene	NGS	99	<1.6	7.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035523			108-88-3	Toluene	NGS	85	<1.5	2.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035523			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035523			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	J

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

a - LCS Outside Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-C
Customer Sample ID: 16-08766-2-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035523			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
S16T035523			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035523			142-82-5	n-Heptane	NGS	84	<1.4	17	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035523			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-D

Customer Sample ID: 16-08766-2-IN-D

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035524			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035524			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035524			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035524			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
S16T035524			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
S16T035524			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035524			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
S16T035524			71-36-3	1-Butanol	NGS	140	<8.9	380	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035524			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035524			71-23-8	1-Propanol	NGS	120	<3.0	40	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035524			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035524			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035524			78-93-3	2-Butanone	NGS	94	<1.9	7.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035524			110-43-0	2-Heptanone	NGS	86	<1.6	2.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035524			591-78-6	2-Hexanone	NGS	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035524			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035524			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.4	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035524			106-35-4	3-Heptanone	NGS	88	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035524			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035524			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035524			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
S16T035524			67-64-1	Acetone	NGS	81	<4.3	58	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035524			75-05-8	Acetonitrile	NGS	81	<1.8	280	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035524			98-86-2	Acetophenone	NGS	89	<2.6	3.3	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035524			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035524			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035524			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-D
Customer Sample ID: 16-08766-2-IN-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035524			71-43-2	Benzene	NGS	90	<1.2	2.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035524			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035524			123-72-8	Butanal	NGS	100	<2.1	3.8	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035524			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035524			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035524			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035524			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035524			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035524			64-17-5	Ethanol	NGS	100	<7.4	230	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035524			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			110-00-9	Furan	NGS	86	<1.6	4.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035524			110-54-3	Hexane	NGS	85	<1.7	19	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035524			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035524			75-09-2	Methylene Chloride	NGS	90	<2.7	4.0	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035524			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035524			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035524			110-59-8	Pentanenitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035524			107-12-0	Propanenitrile	NGS	95	<1.4	2.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035524			110-96-1	Pyridine	NGS	130	<3.8	4.7	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035524			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035524			127-18-4	Tetrachloroethene	NGS	99	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035524			108-88-3	Toluene	NGS	85	<1.5	3.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035524			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035524			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	U

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range
a - LCS Outside Range

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-D
Customer Sample ID: 16-08766-2-IN-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035524			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
S16T035524			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035524			142-82-5	n-Heptane	NGS	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035524			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-E

Customer Sample ID: 16-08766-2-IN-E

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035525			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035525			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035525			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035525			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
S16T035525			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
S16T035525			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035525			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
S16T035525			71-36-3	1-Butanol	NGS	140	<8.9	320	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035525			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035525			71-23-8	1-Propanol	NGS	120	<3.0	36	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035525			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035525			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035525			78-93-3	2-Butanone	NGS	94	<1.9	7.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035525			110-43-0	2-Heptanone	NGS	86	<1.6	2.1	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035525			591-78-6	2-Hexanone	NGS	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035525			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035525			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.5	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035525			106-35-4	3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035525			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035525			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
S16T035525			67-64-1	Acetone	NGS	81	<4.3	94	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035525			75-05-8	Acetonitrile	NGS	81	<1.8	140	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035525			98-86-2	Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035525			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035525			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035525			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

J - Estimated
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L - LLS Outside Range

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-E
Customer Sample ID: 16-08766-2-IN-E

Sample#	R	AS	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035525			71-43-2	Benzene	NGS	90	<1.2	3.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035525			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035525			123-72-8	Butanal	NGS	100	<2.1	4.1	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035525			109-74-0	Butanenitrile	NGS	97	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035525			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035525			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035525			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035525			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035525			84-17-5	Ethanol	NGS	100	<7.4	190	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035525			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			110-00-9	Furan	NGS	86	<1.6	4.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035525			110-54-3	Hexane	NGS	85	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035525			828-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035525			75-09-2	Methylene Chloride	NGS	90	<2.7	3.1	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035525			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035525			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035525			110-59-8	Pentanenitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035525			107-12-0	Propanenitrile	NGS	95	<1.4	2.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035525			110-96-1	Pyridine	NGS	130	<3.8	3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035525			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035525			127-18-4	Tetrachloroethene	NGS	99	<1.6	3.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035525			108-88-3	Toluene	NGS	85	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035525			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035525			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	9.1	n/a	n/a	n/a	n/a	1.6	n/a	J

J - Estimated
Q - Qualitative

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L - LLS Outside Range

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NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-E
Customer Sample ID: 16-08766-2-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035525			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
S16T035525			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035525			142-82-5	n-Heptane	NGS	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035525			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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L - LLS Outside Range

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a - LCS Outside Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-F

Customer Sample ID: 16-08766-2-IN-F

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035526			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035526			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU
S16T035526			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035526			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035526			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
S16T035526			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035526			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T035526			71-36-3	1-Butanol	NGS	140	<8.9	320	n/a	n/a	n/a	n/a	8.9	n/a	Qa
S16T035526			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035526			71-23-8	1-Propanol	NGS	120	<3.0	41	n/a	n/a	n/a	n/a	3.0	n/a	Q
S16T035526			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	QU
S16T035526			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU
S16T035526			78-93-3	2-Butanone	NGS	94	<1.9	6.9	n/a	n/a	n/a	n/a	1.9	n/a	QJ
S16T035526			110-43-0	2-Heptanone	NGS	86	<1.6	2.3	n/a	n/a	n/a	n/a	1.6	n/a	QJ
S16T035526			591-78-6	2-Hexanone	NGS	85	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	QJ
S16T035526			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035526			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.7	n/a	n/a	n/a	n/a	1.7	n/a	QJ
S16T035526			106-35-4	3-Heptanone	NGS	88	<1.5	1.6	n/a	n/a	n/a	n/a	1.5	n/a	QJ
S16T035526			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035526			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035526			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	QU
S16T035526			67-64-1	Acetone	NGS	81	<4.3	43	n/a	n/a	n/a	n/a	4.3	n/a	Q
S16T035526			75-05-8	Acetonitrile	NGS	81	<1.8	31	n/a	n/a	n/a	n/a	1.8	n/a	Q
S16T035526			98-86-2	Acetophenone	NGS	89	<2.6	3.0	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035526			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	QU
S16T035526			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	QU
S16T035526			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	QU

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-F
Customer Sample ID: 16-08766-2-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035526			71-43-2	Benzene	NGS	90	<1.2	2.8	n/a	n/a	n/a	n/a	1.2	n/a	UQ
S16T035526			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035526			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	QU
S16T035526			109-74-0	Butanenitrile	NGS	97	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	UQ
S16T035526			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035526			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	QU
S16T035526			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	QU
S16T035526			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035526			64-17-5	Ethanol	NGS	100	<1.4	180	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035526			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			110-00-9	Furan	NGS	86	<1.6	5.4	n/a	n/a	n/a	n/a	1.6	n/a	UQ
S16T035526			110-54-3	Hexane	NGS	85	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	Q
S16T035526			828-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035526			75-09-2	Methylene Chloride	NGS	90	<2.7	3.6	n/a	n/a	n/a	n/a	2.7	n/a	UQ
S16T035526			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035526			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035526			110-59-8	Pentanenitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035526			107-12-0	Propanenitrile	NGS	95	<1.4	2.1	n/a	n/a	n/a	n/a	1.4	n/a	UQ
S16T035526			110-86-1	Pyridine	NGS	130	<3.8	4.9	n/a	n/a	n/a	n/a	3.8	n/a	UQ
S16T035526			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	QU
S16T035526			127-18-4	Tetrachloroethene	NGS	99	<1.6	3.2	n/a	n/a	n/a	n/a	1.6	n/a	UQ
S16T035526			108-88-3	Toluene	NGS	85	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	UQ
S16T035526			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	QU
S16T035526			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	UQ

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-F
Customer Sample ID: 16-08766-2-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035526			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	QU
S16T035526			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	QU
S16T035526			142-82-5	n-Heptane	NGS	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	Q
S16T035526			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	QU

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163067

SDG Number:

Customer Sample ID: 16-08766-2-IN-G

Customer Sample ID: 16-08766-2-IN-G

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035527		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035527		79-00-5		1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		75-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035527		75-35-4		1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035527		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
S16T035527		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
S16T035527		108-46-7		1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035527		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
S16T035527		71-36-3		1-Butanol	NGS	140	<8.9	350	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035527		111-70-6		1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035527		71-23-8		1-Propanol	NGS	120	<3.0	38	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035527		108-47-4		2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035527		1708-29-8		2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035527		78-93-3		2-Butanone	NGS	94	<1.9	7.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035527		110-43-0		2-Heptanone	NGS	86	<1.6	1.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035527		591-78-6		2-Hexanone	NGS	85	<1.2	1.6	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035527		534-22-5		2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035527		78-94-4		3-Buten-2-one	NGS	89	<1.7	2.1	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035527		106-35-4		3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		106-68-3		3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035527		105-42-0		4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035527		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
S16T035527		67-64-1		Acetone	NGS	81	<4.3	56	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035527		75-05-8		Acetonitrile	NGS	81	<1.8	120	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035527		98-86-2		Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035527		107-13-1		Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035527		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035527		107-05-1		Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-G
Customer Sample ID: 16-08766-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035527		71-43-2		Benzene	NGS	90	<1.2	3.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035527		100-47-0		Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035527		123-72-8		Butanal	NGS	100	<2.1	2.7	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035527		109-74-0		Butanenitrile	NGS	97	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035527		56-23-5		Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035527		108-90-7		Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		75-00-3		Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035527		67-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		110-82-7		Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035527		124-18-5		Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035527		64-17-5		Ethanol	NGS	100	<7.4	24.0	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035527		141-78-6		Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		100-41-4		Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		110-00-9		Furan	NGS	86	<1.6	5.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035527		110-54-3		Hexane	NGS	85	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035527		628-73-9		Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		126-98-7		Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035527		75-09-2		Methylene Chloride	NGS	90	<2.7	3.8	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035527		91-20-3		Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035527		98-95-3		Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035527		110-59-8		Pentanenitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035527		107-12-0		Propanenitrile	NGS	95	<1.4	2.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035527		110-86-1		Pyridine	NGS	130	<3.8	4.0	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035527		100-42-5		Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035527		127-18-4		Tetrachloroethene	NGS	99	<1.6	2.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035527		108-88-3		Toluene	NGS	85	<1.5	2.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035527		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035527		75-69-4		Trichlorofluoromethane	NGS	93	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	J

J - Estimated
Q - Qualitative

U - Less Than Detection Limit
E - Outside Calibration Range

L - LLS Outside Range

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163067
SDG Number:
Customer Sample ID: 16-08766-2-IN-G
Customer Sample ID: 16-08766-2-IN-G

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035527			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035527			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035527			142-82-5	n-Heptane	NGS	84	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035527			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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John Dug
12/12/16

Cartridge Evaluation
Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-BASE-EFF

Customer Sample ID: 16-08765-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035507			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
S16T035507			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
S16T035507			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035507			75-35-4	1,2-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035507			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
S16T035507			542-75-6	1,3-Dichloropropene (Total)	NGS										
S16T035507			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
S16T035507			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
S16T035507			71-36-3	1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035507			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035507			71-23-8	1-Propanol	NGS	120	<3.0	8.6	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035507			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
S16T035507			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
S16T035507			78-93-3	2-Butanone	NGS	94	<1.9	1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035507			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035507			591-78-6	2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035507			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035507			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
S16T035507			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035507			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035507			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035507			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035507			67-84-1	Acetone	NGS	88	<4.3	21	n/a	n/a	n/a	n/a	4.3	n/a	
S16T035507			75-05-8	Acetonitrile	NGS	84	<1.8	7.6	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035507			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035507			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035507			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035507			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

J - Estimated
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Y - Comment

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

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-BASE-EFF

Customer Sample ID: 16-08765-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rac %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035507		71-43-2		Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T035507		100-47-0		Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T035507		123-72-8		Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	2.1	n/a U
S16T035507		109-74-0		Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	n/a	1.2	n/a U
S16T035507		56-23-5		Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035507		108-90-7		Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		75-00-3		Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	n/a	1.9	n/a U
S16T035507		67-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		110-82-7		Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	1.8	n/a U
S16T035507		124-18-5		Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	n/a	2.8	n/a U
S16T035507		64-17-5		Ethanol	NGS	120	<7.4	11	n/a	n/a	n/a	n/a	n/a	7.4	n/a J
S16T035507		141-78-6		Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		100-41-4		Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		110-00-9		Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035507		110-54-3		Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	1.7	n/a U
S16T035507		628-73-9		Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		126-98-7		Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035507		75-09-2		Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	n/a	2.7	n/a U
S16T035507		91-20-3		Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	n/a	3.7	n/a U
S16T035507		98-95-3		Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	2.6	n/a U
S16T035507		110-59-8		Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035507		107-12-0		Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	n/a	1.4	n/a U
S16T035507		110-86-1		Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	n/a	3.8	n/a U
S16T035507		100-42-5		Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U
S16T035507		127-18-4		Tetrachloroethene	NGS	100	<1.6	28	n/a	n/a	n/a	n/a	n/a	1.6	n/a
S16T035507		108-88-3		Toluene	NGS	92	<1.5	3.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a J
S16T035507		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	n/a	1.5	n/a U
S16T035507		75-69-4		Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	n/a	1.6	n/a U

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U - Less Than Detection Limit
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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BASE-EFF
Customer Sample ID: 16-08765-2-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035507			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035507			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035507			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035507			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BASE-IN
Customer Sample ID: 16-08765-2-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rac %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035508			79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035508			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
S16T035508			75-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035508			75-35-4	1,1-Dichloroethene	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035508			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
S16T035508			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
S16T035508			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
S16T035508			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
S16T035508			71-36-3	1-Butanol	NGS	130	<8.9	28	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T035508			111-70-6	1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035508			71-23-8	1-Propanol	NGS	110	<3.0	9.3	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035508			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
S16T035508			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035508			78-93-3	2-Butanone	NGS	93	<1.9	3.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035508			110-43-0	2-Heptanone	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			591-78-6	2-Hexanone	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035508			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035508			78-94-4	3-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035508			106-35-4	3-Heptanone	NGS	89	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			106-68-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035508			105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035508			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	5.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035508			67-64-1	Acetone	NGS	84	<4.3	16	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035508			75-05-8	Acetonitrile	NGS	83	<1.8	7.0	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035508			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035508			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035508			107-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035508			107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BASE-IN
Customer Sample ID: 16-08765-2-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035508			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035508			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035508			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035508			109-74-0	Butanenitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035508			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			75-00-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035508			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035508			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035508			64-17-5	Ethanol	NGS	100	<7.4	20	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035508			141-78-6	Ethyl acetate	NGS	80	<1.5	1.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035508			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			110-54-3	Hexane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035508			628-73-9	Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			126-98-7	Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			75-09-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035508			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035508			98-95-3	Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035508			110-59-8	Pentanenitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			107-12-0	Propanenitrile	NGS	93	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035508			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035508			100-42-5	Styrene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			127-18-4	Tetrachloroethene	NGS	100	<1.6	38	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035508			108-88-3	Toluene	NGS	93	<1.5	7.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035508			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035508			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	5.0	n/a	n/a	n/a	n/a	1.6	n/a	J

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BASE-IN
Customer Sample ID: 16-08765-2-BASE-IN

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035508			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
S16T035508			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T035508			142-82-5	n-Heptane	NGS	87	<1.4	2.2	n/a	n/a	n/a	n/a	1.4		n/a U
S16T035508			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK1
Customer Sample ID: 16-08765-2-BLANK1

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035509			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035509			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035509			75-35-4	1,1-Dichloroethene	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035509			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
S16T035509			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
S16T035509			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035509			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
S16T035509			71-36-3	1-Butanol	NGS	140	<8.9	32	n/a	n/a	n/a	n/a	8.9	n/a	Qa
S16T035509			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035509			71-23-8	1-Propanol	NGS	120	<3.0	39	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035509			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035509			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035509			78-93-3	2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035509			110-43-0	2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			591-78-6	2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035509			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035509			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
S16T035509			106-35-4	3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035509			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035509			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
S16T035509			67-64-1	Acetone	NGS	81	<4.3	32	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035509			75-05-8	Acetonitrile	NGS	81	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035509			98-86-2	Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035509			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035509			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035509			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK1
Customer Sample ID: 16-08765-2-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035509			71-43-2	Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035509			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035509			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035509			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035509			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035509			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035509			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035509			84-17-5	Ethanol	NGS	100	<7.4	17	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035509			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			110-00-9	Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			110-54-3	Hexane	NGS	85	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035509			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			75-09-2	Methylene Chloride	NGS	90	<2.7	3.7	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035509			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035509			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035509			110-59-8	Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			107-12-0	Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035509			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035509			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			127-18-4	Tetrachloroethene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035509			108-88-3	Toluene	NGS	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035509			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK1
Customer Sample ID: 16-08765-2-BLANK1

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035509			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
S16T035509			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035509			142-82-5	n-Heptane	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035509			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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E - Outside Calibration Range

B - Blank Contamination
Y - Comment

U - Less Than Detection Limit
Q - Qualitative

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK2
Customer Sample ID: 16-08765-2-BLANK2

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035510			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035510			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035510			75-35-4	1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035510			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
S16T035510			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035510			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035510			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
S16T035510			71-38-3	1-Butanol	NGS	140	<8.9	17	n/a	n/a	n/a	n/a	8.9	n/a	JQu
S16T035510			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035510			71-23-8	1-Propanol	NGS	120	<3.0	30	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035510			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035510			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035510			78-93-3	2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035510			110-43-0	2-Heptanone	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			591-78-6	2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035510			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035510			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
S16T035510			106-35-4	3-Heptanone	NGS	88	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035510			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035510			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
S16T035510			67-64-1	Acetone	NGS	81	<4.3	21	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035510			75-05-8	Acetonitrile	NGS	81	<1.8	810	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T035510			98-86-2	Acetophenone	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035510			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035510			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035510			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK2
Customer Sample ID: 16-08765-2-BLANK2

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035510			71-43-2	Benzene	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035510			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035510			123-72-8	Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035510			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035510			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			108-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035510			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035510			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035510			64-17-5	Ethanol	NGS	100	<7.4	20	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035510			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			110-00-9	Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			110-54-3	Hexane	NGS	85	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035510			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			75-09-2	Methylene Chloride	NGS	90	<2.7	4.4	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035510			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035510			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035510			110-59-8	Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			107-12-0	Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035510			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035510			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			127-18-4	Tetrachloroethene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035510			108-88-3	Toluene	NGS	85	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035510			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-BLANK2
Customer Sample ID: 16-08765-2-BLANK2

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035510			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
S16T035510			123-96-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035510			142-82-5	n-Heptane	NGS	84	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035510			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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L - LLS Outside Range
E - Outside Calibration Range
B - Blank Contamination
Y - Comment
U - Less Than Detection Limit
Q - Qualitative

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-B
Customer Sample ID: 16-08765-2-IN-B

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T035511			79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035511			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
S16T035511			75-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035511			75-35-4	1,1-Dichloroethane	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035511			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
S16T035511			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
S16T035511			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
S16T035511			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
S16T035511			71-36-3	1-Butanol	NGS	130	<8.9	350	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T035511			111-70-6	1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035511			71-23-8	1-Propanol	NGS	110	<3.3	35	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035511			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
S16T035511			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035511			78-93-3	2-Butanone	NGS	93	<1.9	5.1	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035511			110-43-0	2-Heptanone	NGS	88	<1.6	3.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035511			591-78-6	2-Hexanone	NGS	86	<1.2	2.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035511			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035511			78-94-4	3-Buten-2-one	NGS	87	<1.7	10	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035511			106-35-4	3-Heptanone	NGS	89	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035511			106-68-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035511			105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035511			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	3.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035511			67-64-1	Acetone	NGS	84	<4.3	38	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035511			75-05-8	Acetonitrile	NGS	83	<1.8	52	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035511			98-86-2	Acetophenone	NGS	91	<2.6	4.1	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035511			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035511			107-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035511			107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-B
Customer Sample ID: 16-08765-2-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035511		71-43-2		Benzene	NGS	95	<1.2	2.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035511		100-47-0		Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035511		123-72-8		Butanal	NGS	110	<2.1	3.9	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035511		109-74-0		Butanenitrile	NGS	95	<1.2	1.5	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035511		56-23-5		Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035511		108-90-7		Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		75-00-3		Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035511		87-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		110-82-7		Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035511		124-18-5		Decane	NGS	84	<2.8	3.0	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035511		64-17-5		Ethanol	NGS	100	<7.4	230	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035511		141-78-6		Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		100-41-4		Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		110-00-9		Furan	NGS	91	<1.6	4.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035511		110-54-3		Hexane	NGS	91	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035511		628-73-9		Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		126-98-7		Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035511		75-09-2		Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035511		91-20-3		Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035511		98-95-3		Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035511		110-59-8		Pentanenitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035511		107-12-0		Propanenitrile	NGS	93	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035511		110-86-1		Pyridine	NGS	130	<3.8	4.8	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035511		100-42-5		Styrene	NGS	99	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035511		127-18-4		Tetrachloroethene	NGS	100	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035511		108-88-3		Toluene	NGS	93	<1.5	6.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035511		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035511		75-69-4		Trichlorofluoromethane	NGS	100	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	U

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E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-B
Customer Sample ID: 16-08765-2-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035511			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035511			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035511			142-82-5	n-Heptane	NGS	87	<1.4	17	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035511			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Y - Comment
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L - LLS Outside Range
E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-C

Customer Sample ID: 16-08765-2-IN-C

Sample#	R	A#	ICAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035512		79-34-5		1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035512		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
S16T035512		75-34-3		1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035512		75-35-4		1,2-Dichloroethane	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035512		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
S16T035512		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
S16T035512		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
S16T035512		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
S16T035512		71-36-3		1-Butanol	NGS	130	<8.9	410	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T035512		111-70-6		1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035512		71-23-8		1-Propanol	NGS	110	<3.0	30	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035512		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
S16T035512		1708-29-8		2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035512		78-93-3		2-Butanone	NGS	93	<1.9	4.4	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035512		110-43-0		2-Heptanone	NGS	88	<1.6	3.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035512		591-78-6		2-Hexanone	NGS	86	<1.2	2.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035512		534-22-5		2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035512		78-94-4		3-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035512		106-35-4		3-Heptanone	NGS	89	<1.5	3.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035512		106-68-3		3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035512		105-42-0		4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035512		108-10-1		4-Methyl-2-Pentanone	NGS	96	<1.9	3.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035512		67-64-1		Acetone	NGS	84	<4.3	62	n/a	n/a	n/a	n/a	4.3	n/a	
S16T035512		75-05-8		Acetonitrile	NGS	83	<1.8	46	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035512		98-86-2		Acetophenone	NGS	91	<2.6	5.5	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035512		107-13-1		Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035512		107-18-6		Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035512		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
 a - LCS Outside Range
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 Y - Comment
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 E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-C

Customer Sample ID: 16-08765-2-IN-C

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035512			71-43-2	Benzene	NGS	95	<1.2	2.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035512			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035512			123-72-8	Butanal	NGS	110	<2.1	3.3	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035512			108-74-0	Butanenitrile	NGS	95	<1.2	1.3	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035512			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035512			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			75-00-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035512			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035512			124-18-5	Decane	NGS	84	<2.8	2.9	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035512			64-17-5	Ethanol	NGS	100	<7.4	280	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035512			141-78-6	Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			110-00-9	Furan	NGS	91	<1.6	9.3	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035512			110-54-3	Hexane	NGS	93	<1.7	20	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035512			628-73-9	Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			126-98-7	Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035512			75-09-2	Methylene Chloride	NGS	97	8.8	3.5	n/a	n/a	n/a	n/a	2.7	n/a	BJ
S16T035512			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035512			98-95-3	Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035512			110-59-8	Pentanitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035512			107-12-0	Propanenitrile	NGS	93	<1.4	2.7	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035512			110-96-1	Pyridine	NGS	130	<3.8	5.2	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035512			100-42-5	Styrene	NGS	99	<1.6	2.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035512			127-18-4	Tetrachloroethene	NGS	100	<1.6	24	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035512			108-88-3	Toluene	NGS	93	<1.5	7.6	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035512			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035512			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-C
Customer Sample ID: 16-08765-2-IN-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035512			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
S16T035512			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035512			142-82-5	n-Heptane	NGS	87	<1.4	19	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035512			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-D
Customer Sample ID: 16-08765-2-IN-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035513			79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035513			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	n/a U
S16T035513			75-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T035513			75-35-4	1,1-Dichloroethane	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035513			107-06-2	1,2-Dichloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	n/a U
S16T035513			542-75-6	1,3-Dichloropropene (Total)	NGS	n/a	n/a	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	n/a U
S16T035513			106-46-7	1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	n/a U
S16T035513			123-91-1	1,4-Dioxane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T035513			71-36-3	1-Butanol	NGS	130	<8.9	400	n/a	n/a	n/a	n/a	8.9	n/a	n/a Y
S16T035513			111-70-6	1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	n/a U
S16T035513			71-23-8	1-Propanol	NGS	110	<3.0	30	n/a	n/a	n/a	n/a	3.0	n/a	n/a U
S16T035513			108-47-4	2,4-Dimethylpyridine	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	n/a U
S16T035513			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U
S16T035513			78-93-3	2-Butanone	NGS	93	<1.9	5.3	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T035513			110-43-0	2-Heptanone	NGS	88	<1.6	2.9	n/a	n/a	n/a	n/a	1.6	n/a	n/a J
S16T035513			591-78-6	2-Hexanone	NGS	86	<1.2	1.9	n/a	n/a	n/a	n/a	1.2	n/a	n/a J
S16T035513			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	n/a U
S16T035513			78-94-4	3-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T035513			106-35-4	3-Heptanone	NGS	89	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a	n/a J
S16T035513			106-68-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	n/a U
S16T035513			105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	n/a U
S16T035513			108-10-1	4-Methyl-2-Pentanone	NGS	96	<1.9	2.0	n/a	n/a	n/a	n/a	1.9	n/a	n/a J
S16T035513			67-64-1	Acetone	NGS	84	<4.3	33	n/a	n/a	n/a	n/a	4.3	n/a	n/a
S16T035513			75-05-8	Acetonitrile	NGS	83	<1.8	28	n/a	n/a	n/a	n/a	1.8	n/a	n/a
S16T035513			98-86-2	Acetophenone	NGS	91	<2.6	3.8	n/a	n/a	n/a	n/a	2.6	n/a	n/a J
S16T035513			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	n/a U
S16T035513			107-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	n/a U
S16T035513			107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	n/a U

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L - LLS Outside Range
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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-D
Customer Sample ID: 16-08765-2-IN-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T035513			71-43-2	Benzene	NGS	95	<1.2	2.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035513			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035513			123-72-8	Butanal	NGS	110	<2.1	4.1	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035513			109-74-0	Butanenitrile	NGS	95	<1.2	1.4	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035513			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035513			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			75-00-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035513			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035513			124-18-5	Decane	NGS	84	<2.8	3.1	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035513			64-17-5	Ethanol	NGS	100	<7.4	21.0	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035513			141-78-6	Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			110-00-9	Furan	NGS	91	<1.6	5.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035513			110-54-3	Hexane	NGS	93	<1.7	24	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035513			628-73-9	Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			128-98-7	Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035513			75-09-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035513			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035513			98-95-3	Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035513			110-59-8	Pentanitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035513			107-12-0	Propanenitrile	NGS	93	<1.4	2.3	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035513			110-86-1	Pyridine	NGS	130	<3.8	4.6	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035513			100-42-5	Styrene	NGS	99	<1.6	1.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035513			127-18-4	Tetrachloroethene	NGS	100	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035513			108-88-3	Toluene	NGS	93	<1.5	4.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035513			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035513			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	13	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-D
Customer Sample ID: 16-08765-2-IN-D

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035513			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
S16T035513			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035513			142-92-5	n-Heptane	NGS	87	<1.4	20	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035513			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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E - Outside Calibration Range

U - Less Than Detection Limit
Q - Qualitative
B - Blank Contamination
Y - Comment

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-E
Customer Sample ID: 16-08765-2-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TOU VOA #2															
S16T035514			79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T035514			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
S16T035514			75-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035514			75-35-4	1,2-Dichloroethane	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T035514			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
S16T035514			542-75-6	1,3-Dichloropropene (Total)	NGS										
S16T035514			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
S16T035514			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
S16T035514			71-36-3	1-Butanol	NGS	130	<8.9	310	n/a	n/a	n/a	n/a	8.9		n/a Y
S16T035514			111-70-6	1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a U
S16T035514			71-23-8	1-Propanol	NGS	110	<3.0	25	n/a	n/a	n/a	n/a	3.0		n/a U
S16T035514			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
S16T035514			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T035514			78-93-3	2-Butanone	NGS	93	<1.9	5.0	n/a	n/a	n/a	n/a	1.9		n/a J
S16T035514			110-43-0	2-Heptanone	NGS	88	<1.6	2.5	n/a	n/a	n/a	n/a	1.6		n/a J
S16T035514			591-78-6	2-Hexanone	NGS	86	<1.2	1.6	n/a	n/a	n/a	n/a	1.2		n/a J
S16T035514			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035514			78-94-4	3-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T035514			106-35-4	3-Heptanone	NGS	89	<1.5	1.8	n/a	n/a	n/a	n/a	1.5		n/a J
S16T035514			106-68-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035514			105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T035514			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
S16T035514			67-64-1	Acetone	NGS	84	<4.3	22	n/a	n/a	n/a	n/a	4.3		n/a
S16T035514			75-05-8	Acetonitrile	NGS	83	<1.8	19	n/a	n/a	n/a	n/a	1.8		n/a
S16T035514			98-86-2	Acetophenone	NGS	91	<2.6	4.5	n/a	n/a	n/a	n/a	2.6		n/a J
S16T035514			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T035514			107-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035514			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
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U - Less Than Detection Limit
Q - Qualitative
B - Blank Contamination
Y - Comment
NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range
E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-E

Customer Sample ID: 16-08765-2-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035514			71-43-2	Benzene	NGS	95	<1.2	2.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035514			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035514			123-72-8	Butanal	NGS	110	<2.1	3.1	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035514			109-74-0	Butanenitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035514			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035514			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			75-00-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035514			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035514			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035514			64-17-5	Ethanol	NGS	100	<7.4	160	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035514			141-78-6	Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			110-00-9	Furan	NGS	91	<1.6	7.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035514			110-54-3	Hexane	NGS	91	<1.7	14	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035514			628-73-9	Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			126-98-7	Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035514			75-09-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035514			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035514			98-95-3	Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035514			110-59-8	Pentanenitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035514			107-12-0	Propanenitrile	NGS	93	<1.4	1.8	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035514			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035514			100-42-5	Styrene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035514			127-18-4	Tetrachloroethene	NGS	100	<1.6	9.0	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035514			108-88-3	Toluene	NGS	93	<1.5	3.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035514			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035514			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	11	n/a	n/a	n/a	n/a	1.6	n/a	J

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B - Blank Contamination
Y - Comment
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L - LLS Outside Range
E - Outside Calibration Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-E

Customer Sample ID: 16-08765-2-IN-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035514			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
S16T035514			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035514			142-92-5	n-Heptane	NGS	87	<1.4	16	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035514			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Y - Comment

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-F
Customer Sample ID: 16-08765-2-IN-F

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035515			79-34-5	1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T035515			79-00-5	1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035515			75-34-3	1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035515			75-35-4	1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3		n/a U
S16T035515			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
S16T035515			542-75-6	1,3-Dichloropropene (Total)	NGS			<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035515			106-46-7	1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0		n/a U
S16T035515			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
S16T035515			71-36-3	1-Butanol	NGS	140	<8.9	400	n/a	n/a	n/a	n/a	8.9		n/a a
S16T035515			111-70-6	1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6		n/a LU
S16T035515			71-23-8	1-Propanol	NGS	120	<3.0	57	n/a	n/a	n/a	n/a	3.0		n/a
S16T035515			108-47-4	2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3		n/a U
S16T035515			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T035515			78-93-3	2-Butanone	NGS	94	<1.9	5.8	n/a	n/a	n/a	n/a	1.9		n/a J
S16T035515			110-43-0	2-Heptanone	NGS	86	<1.6	2.4	n/a	n/a	n/a	n/a	1.6		n/a J
S16T035515			591-78-6	2-Hexanone	NGS	85	<1.2	1.7	n/a	n/a	n/a	n/a	1.2		n/a J
S16T035515			534-22-5	2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035515			78-94-4	3-Buten-2-one	NGS	89	<1.7	2.6	n/a	n/a	n/a	n/a	1.7		n/a J
S16T035515			106-35-4	3-Heptanone	NGS	88	<1.5	2.5	n/a	n/a	n/a	n/a	1.5		n/a J
S16T035515			106-68-3	3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4		n/a U
S16T035515			105-42-0	4-Methyl-2-hexanone	NGS	85	<1.3	4.0	n/a	n/a	n/a	n/a	1.3		n/a J
S16T035515			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
S16T035515			67-64-1	Acetone	NGS	81	<4.3	39	n/a	n/a	n/a	n/a	4.3		n/a
S16T035515			75-05-8	Acetonitrile	NGS	81	<1.8	28	n/a	n/a	n/a	n/a	1.8		n/a
S16T035515			98-86-2	Acetophenone	NGS	89	<2.6	6.5	n/a	n/a	n/a	n/a	2.6		n/a J
S16T035515			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T035515			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9		n/a U
S16T035515			107-05-1	Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-F

Customer Sample ID: 16-08765-2-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035515			71-43-2	Benzene	NGS	90	<1.2	2.6	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035515			100-47-0	Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035515			123-72-8	Butanal	NGS	100	<2.1	4.9	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035515			109-74-0	Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035515			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035515			109-90-7	Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			75-00-3	Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035515			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			110-82-7	Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035515			124-18-5	Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035515			64-17-5	Ethanol	NGS	100	<7.4	220	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035515			141-78-6	Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			100-41-4	Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			110-00-9	Furan	NGS	86	<1.6	6.4	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035515			110-54-3	Hexane	NGS	85	<1.7	18	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035515			628-73-9	Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			126-98-7	Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035515			75-08-2	Methylene Chloride	NGS	90	<2.7	7.4	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035515			91-20-3	Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035515			98-95-3	Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035515			110-59-8	Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035515			107-12-0	Propanenitrile	NGS	95	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035515			110-86-1	Pyridine	NGS	130	<3.8	3.9	n/a	n/a	n/a	n/a	3.8	n/a	J
S16T035515			100-42-5	Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035515			127-18-4	Tetrachloroethene	NGS	99	<1.6	6.8	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035515			108-88-3	Toluene	NGS	85	<1.5	4.2	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035515			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035515			75-69-4	Trichlorofluoromethane	NGS	93	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-F
Customer Sample ID: 16-08765-2-IN-F

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035515			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
S16T035515			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035515			142-82-5	n-Heptane	NGS	84	<1.4	18	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035515			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-G
Customer Sample ID: 16-08765-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035516		79-34-5		1,1,2,2-Tetrachloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035516		79-00-5		1,1,2-Trichloroethane	NGS	98	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		75-34-3		1,1-Dichloroethane	NGS	92	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035516		75-35-4		1,1-Dichloroethane	NGS	87	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035516		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
S16T035516		542-75-6		1,3-Dichloropropene (Total)	NGS	n/a	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035516		106-46-7		1,4-Dichlorobenzene	NGS	98	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035516		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
S16T035516		71-36-3		1-Butanol	NGS	140	<8.9	110	n/a	n/a	n/a	n/a	8.9	n/a	a
S16T035516		111-70-6		1-Heptanol	NGS	87	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	LU
S16T035516		71-23-8		1-Propanol	NGS	120	<3.0	45	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035516		108-47-4		2,4-Dimethylpyridine	NGS	94	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035516		1708-29-8		2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035516		78-93-3		2-Butanone	NGS	94	<1.9	4.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035516		110-43-0		2-Heptanone	NGS	86	<1.6	1.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035516		591-78-6		2-Hexanone	NGS	85	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035516		534-22-5		2-Methylfuran	NGS	91	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035516		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
S16T035516		106-35-4		3-Heptanone	NGS	88	<1.5	1.8	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035516		106-68-3		3-Octanone	NGS	87	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035516		105-42-0		4-Methyl-2-hexanone	NGS	85	<1.3	3.9	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T035516		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
S16T035516		57-64-1		Acetone	NGS	81	<4.3	51	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035516		75-05-8		Acetonitrile	NGS	81	<1.8	180	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035516		98-86-2		Acetophenone	NGS	89	<2.6	3.8	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035516		107-13-1		Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035516		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035516		107-05-1		Allyl Chloride	NGS	86	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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U - Less Than Detection Limit
Q - Qualitative

B - Blank Contamination
Y - Comment

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163066
SDG Number:
Customer Sample ID: 16-08765-2-IN-G
Customer Sample ID: 16-08765-2-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035516		71-43-2		Benzene	NGS	90	<1.2	1.7	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035516		100-47-0		Benzonitrile	NGS	88	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035516		123-72-8		Butanal	NGS	100	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035516		109-74-0		Butanenitrile	NGS	97	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035516		56-23-5		Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035516		108-90-7		Chlorobenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		75-00-3		Chloroethane	NGS	87	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035516		67-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		110-82-7		Cyclohexane	NGS	92	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035516		124-18-5		Decane	NGS	79	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035516		84-17-5		Ethanol	NGS	100	<1.4	57	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035516		141-78-6		Ethyl acetate	NGS	81	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		100-41-4		Ethylbenzene	NGS	90	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		110-00-9		Furan	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035516		110-54-3		Hexane	NGS	85	<1.7	4.3	n/a	n/a	n/a	n/a	1.7	n/a	J
S16T035516		828-73-9		Hexanenitrile	NGS	91	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		126-98-7		Methacrylonitrile	NGS	97	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035516		75-09-2		Methylene Chloride	NGS	90	<2.7	8.6	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035516		91-20-3		Naphthalene	NGS	88	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035516		98-95-3		Nitrobenzene	NGS	89	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035516		110-59-8		Pentanitrile	NGS	86	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035516		107-12-0		Propanenitrile	NGS	95	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035516		110-96-1		Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035516		100-42-5		Styrene	NGS	94	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035516		127-18-4		Tetrachloroethene	NGS	99	<1.6	6.2	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035516		108-88-3		Toluene	NGS	85	<1.5	4.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035516		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035516		75-69-4		Trichlorofluoromethane	NGS	93	<1.6	4.8	n/a	n/a	n/a	n/a	1.6	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163066

SDG Number:

Customer Sample ID: 16-08765-2-IN-G

Customer Sample ID: 16-08765-2-IN-G

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035516			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035516			123-86-4	n-Butyl acetate	NGS	74	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035516			142-82-5	n-Heptane	NGS	84	<1.4	5.4	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035516			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
 Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-A

Customer Sample ID: 16-08765-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035494			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
S16T035494			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
S16T035494			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035494			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
S16T035494			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
S16T035494			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
S16T035494			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
S16T035494			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
S16T035494			71-36-3	1-Butanol	NGS	140	<8.9	9.1	n/a	n/a	n/a	n/a	8.9	n/a	JYa
S16T035494			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035494			71-23-8	1-Propanol	NGS	120	<3.0	17	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035494			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
S16T035494			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
S16T035494			78-93-3	2-Butanone	NGS	94	<1.9	2.0	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035494			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			591-78-6	2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035494			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035494			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
S16T035494			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035494			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035494			108-10-1	4-Methyl-2-pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035494			67-64-1	Acetone	NGS	88	<4.3	4.8	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035494			75-05-8	Acetonitrile	NGS	84	<1.8	1.0E+03	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T035494			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035494			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035494			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035494			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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 L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-A
Customer Sample ID: 16-08765-2-EFF-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035494			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035494			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035494			123-72-8	Butanal	NGS	110	<2.1	2.4	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035494			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035494			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035494			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035494			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035494			64-17-5	Ethanol	NGS	120	<7.4	<7.4	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035494			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035494			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	LU
S16T035494			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035494			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035494			110-59-8	Pentanitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035494			110-96-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035494			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			127-18-4	Tetrachloroethene	NGS	100	<1.6	35	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035494			108-88-3	Toluene	NGS	92	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035494			79-01-5	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035494			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-A

Customer Sample ID: 16-08765-2-EFF-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035494			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035494			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035494			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035494			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-B
Customer Sample ID: 16-08765-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035495		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
S16T035495		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
S16T035495		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035495		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
S16T035495		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
S16T035495		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
S16T035495		108-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035495		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
S16T035495		71-36-3		1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035495		111-70-6		1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035495		71-23-8		1-Propanol	NGS	120	<3.0	15	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035495		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
S16T035495		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
S16T035495		78-93-3		2-Butanone	NGS	94	<1.9	2.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035495		110-43-0		2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495		591-78-6		2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035495		534-22-5		2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035495		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
S16T035495		106-35-4		3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495		106-68-3		3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035495		105-42-0		4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035495		108-10-1		4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035495		67-64-1		Acetone	NGS	88	<4.3	7.2	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035495		75-05-8		Acetonitrile	NGS	84	<1.8	15	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035495		98-86-2		Acetophenone	NGS	91	<2.6	2.9	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035495		107-13-1		Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035495		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035495		107-05-1		Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-B
Customer Sample ID: 16-08765-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035495			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035495			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035495			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035495			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035495			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035495			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035495			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035495			64-17-5	Ethanol	NGS	120	<7.4	19	n/a	n/a	n/a	n/a	7.4	n/a	J
S16T035495			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035495			828-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	LU
S16T035495			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035495			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035495			110-59-8	Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035495			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035495			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			127-18-4	Tetrachloroethene	NGS	100	<1.6	29	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035495			108-88-3	Toluene	NGS	92	<1.5	3.1	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035495			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035495			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-2-EFF-B
 Customer Sample ID: 16-08765-2-EFF-B

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035495			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035495			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035495			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035495			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-C
Customer Sample ID: 16-08765-2-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035496			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
S16T035496			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
S16T035496			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035496			75-35-4	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035496			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
S16T035496			542-75-6	1,3-Dichloropropene (Total)	NGS			<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035496			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
S16T035496			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
S16T035496			71-36-3	1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035496			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035496			71-23-8	1-Propanol	NGS	120	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035496			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
S16T035496			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
S16T035496			78-93-3	2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035496			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035496			591-78-6	2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035496			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035496			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
S16T035496			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035496			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035496			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035496			108-10-1	4-Methyl-2-pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035496			67-64-1	Acetone	NGS	88	<4.3	13	n/a	n/a	n/a	n/a	4.3	n/a	
S16T035496			75-05-8	Acetonitrile	NGS	84	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035496			98-86-2	Acetophenone	NGS	91	<2.6	3.3	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035496			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035496			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035496			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-C
Customer Sample ID: 16-08765-2-EFF-C

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035496			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035496			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035496			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T035496			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035496			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035496			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035496			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T035496			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T035496			64-17-5	Ethanol	NGS	120	<7.4	54	n/a	n/a	n/a	n/a	7.4		n/a
S16T035496			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035496			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T035496			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035496			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T035496			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T035496			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T035496			110-59-8	Pentanitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035496			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T035496			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T035496			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035496			127-18-4	Tetrachloroethene	NGS	100	<1.6	35	n/a	n/a	n/a	n/a	1.6		n/a
S16T035496			108-88-3	Toluene	NGS	92	<1.5	3.6	n/a	n/a	n/a	n/a	1.5		n/a J
S16T035496			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035496			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	2.0	n/a	n/a	n/a	n/a	1.6		n/a J

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-C
Customer Sample ID: 16-08765-2-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035496			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035496			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035496			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035496			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected
N - Named TIC
L - LLS Outside Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-D

Customer Sample ID: 16-08765-2-EFF-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035497			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
S16T035497			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
S16T035497			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035497			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
S16T035497			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
S16T035497			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
S16T035497			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
S16T035497			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
S16T035497			71-36-3	1-Butanol	NGS	140	<8.9	11	n/a	n/a	n/a	n/a	8.9	n/a	Y a
S16T035497			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035497			71-23-8	1-Propanol	NGS	120	<3.0	18	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035497			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
S16T035497			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
S16T035497			78-93-3	2-Butanone	NGS	94	<1.9	2.7	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035497			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			591-78-6	2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035497			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035497			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
S16T035497			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035497			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035497			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035497			67-64-1	Acetone	NGS	88	<4.3	6.3	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035497			75-05-8	Acetonitrile	NGS	84	<1.8	7.8	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035497			98-86-2	Acetophenone	NGS	91	<2.6	2.7	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035497			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035497			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035497			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-D
Customer Sample ID: 16-08765-2-EFF-D

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035497			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035497			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035497			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035497			108-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035497			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035497			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035497			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035497			64-17-5	Ethanol	NGS	120	<7.4	58	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035497			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035497			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035497			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035497			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035497			110-59-8	Pentanitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035497			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035497			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			127-18-4	Tetrachloroethene	NGS	100	<1.6	28	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035497			108-88-3	Toluene	NGS	92	<1.5	2.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035497			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035497			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	2.2	n/a	n/a	n/a	n/a	1.6	n/a	J

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N - Named TIC
L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-D
Customer Sample ID: 16-08765-2-EFF-D

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035497			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035497			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035497			142-92-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035497			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

Y - Comment
a - LCS Outside Range

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J - Estimated

U - Less Than Detection Limit
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected
N - Named TIC
L - ILS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-E
Customer Sample ID: 16-08765-2-EFF-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035498			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
S16T035498			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
S16T035498			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035498			75-35-4	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035498			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
S16T035498			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
S16T035498			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
S16T035498			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
S16T035498			71-36-3	1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035498			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035498			71-23-8	1-Propanol	NGS	120	<3.0	17	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035498			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
S16T035498			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
S16T035498			78-93-3	2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035498			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			591-78-6	2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035498			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035498			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
S16T035498			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035498			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035498			108-10-1	4-Methyl-2-pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035498			87-64-1	Acetone	NGS	88	<4.3	5.8	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035498			75-05-8	Acetonitrile	NGS	84	<1.8	9.4	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035498			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035498			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035498			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035498			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-E
Customer Sample ID: 16-08765-2-EFF-E

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035498			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035498			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035498			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035498			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035498			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035498			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035498			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035498			64-17-5	Ethanol	NGS	120	<7.4	89	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035498			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035498			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	LU
S16T035498			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035498			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035498			110-59-8	Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035498			110-96-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035498			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			127-18-4	Tetrachloroethene	NGS	100	<1.6	27	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035498			108-88-3	Toluene	NGS	92	<1.5	2.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035498			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035498			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	4.2	n/a	n/a	n/a	n/a	1.6	n/a	J

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L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-E
Customer Sample ID: 16-08765-2-EFF-E

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035498			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035498			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035498			142-92-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035498			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-F
Customer Sample ID: 16-08765-2-EFF-F

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035499			79-34-5	1,1,2,2-Tetrachloroethane	NGS	97	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035499			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
S16T035499			75-34-3	1,1-Dichloroethane	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035499			75-35-4	1,1-Dichloroethene	NGS	93	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035499			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
S16T035499			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
S16T035499			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
S16T035499			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
S16T035499			71-36-3	1-Butanol	NGS	130	<8.9	24	n/a	n/a	n/a	n/a	8.9	n/a	Y
S16T035499			111-70-6	1-Heptanol	NGS	78	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035499			71-23-8	1-Propanol	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035499			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
S16T035499			1708-29-8	2,5-Dihydrofuran	NGS	99	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035499			78-93-3	2-Butanone	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035499			110-43-0	2-Heptanone	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			591-78-6	2-Hexanone	NGS	86	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035499			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035499			78-94-4	3-Buten-2-one	NGS	87	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035499			106-35-4	3-Heptanone	NGS	89	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			106-68-3	3-Octanone	NGS	90	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035499			105-42-0	4-Methyl-2-hexanone	NGS	88	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035499			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
S16T035499			67-64-1	Acetone	NGS	84	<4.3	13	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035499			75-05-8	Acetonitrile	NGS	83	<1.8	470	n/a	n/a	n/a	n/a	1.8	n/a	E
S16T035499			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035499			107-13-1	Acrylonitrile	NGS	90	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035499			107-18-6	Allyl Alcohol	NGS	100	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035499			107-05-1	Allyl Chloride	NGS	88	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-F
Customer Sample ID: 16-08765-2-EFF-F

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035499			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035499			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035499			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035499			109-74-0	Butanenitrile	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035499			56-23-5	Carbon tetrachloride	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			75-00-3	Chloroethane	NGS	93	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035499			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035499			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035499			64-17-5	Ethanol	NGS	100	<7.4	94	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035499			141-78-6	Ethyl acetate	NGS	80	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			100-41-4	Ethylbenzene	NGS	97	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			110-54-3	Hexane	NGS	91	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035499			628-73-9	Hexanenitrile	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			126-98-7	Methacrylonitrile	NGS	96	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			75-09-2	Methylene Chloride	NGS	97	8.8	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035499			91-20-3	Naphthalene	NGS	94	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035499			98-95-3	Nitrobenzene	NGS	95	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035499			110-59-8	Pentanitrile	NGS	88	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			107-12-0	Propanenitrile	NGS	93	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035499			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035499			100-42-5	Styrene	NGS	99	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			127-18-4	Tetrachloroethene	NGS	100	<1.6	15	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035499			108-88-3	Toluene	NGS	93	<1.5	2.2	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035499			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035499			75-69-4	Trichlorofluoromethane	NGS	100	<1.6	4.7	n/a	n/a	n/a	n/a	1.6	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-F
Customer Sample ID: 16-08765-2-EFF-F

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035499			10061-01-5	dis-1,3-Dichloropropene	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035499			123-86-4	n-Butyl acetate	NGS	75	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035499			142-82-5	n-Heptane	NGS	87	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035499			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-G
Customer Sample ID: 16-08765-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035500		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
S16T035500		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
S16T035500		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035500		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
S16T035500		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
S16T035500		542-75-6		1,3-Dichloropropene (Total)	NGS			<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035500		108-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035500		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
S16T035500		71-36-3		1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035500		111-70-6		1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035500		71-23-8		1-Propanol	NGS	120	<3.0	14	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035500		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
S16T035500		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
S16T035500		78-93-3		2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035500		110-43-0		2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035500		591-78-6		2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035500		534-22-5		2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035500		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
S16T035500		106-35-4		3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035500		106-68-3		3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035500		105-42-0		4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035500		108-10-1		4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035500		67-64-1		Acetone	NGS	88	<4.3	5.9	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035500		75-05-8		Acetonitrile	NGS	84	<1.8	11	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035500		98-86-2		Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035500		107-13-1		Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035500		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035500		107-05-1		Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-G
Customer Sample ID: 16-08765-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035500		71-43-2		Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035500		100-47-0		Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035500		123-72-8		Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1		n/a U
S16T035500		109-74-0		Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2		n/a U
S16T035500		56-23-5		Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035500		108-90-7		Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		75-00-3		Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9		n/a U
S16T035500		87-66-3		Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		110-82-7		Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8		n/a U
S16T035500		124-18-5		Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8		n/a U
S16T035500		64-17-5		Ethanol	NGS	120	<7.4	110	n/a	n/a	n/a	n/a	7.4		n/a
S16T035500		141-78-6		Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		100-41-4		Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		110-00-9		Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035500		110-54-3		Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7		n/a U
S16T035500		628-73-9		Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		126-98-7		Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035500		75-09-2		Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7		n/a U
S16T035500		91-20-3		Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7		n/a U
S16T035500		98-95-3		Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6		n/a U
S16T035500		110-59-8		Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035500		107-12-0		Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4		n/a U
S16T035500		110-86-1		Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8		n/a U
S16T035500		100-42-5		Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6		n/a U
S16T035500		127-18-4		Tetrachloroethene	NGS	100	<1.6	14	n/a	n/a	n/a	n/a	1.6		n/a
S16T035500		108-88-3		Toluene	NGS	92	<1.5	2.7	n/a	n/a	n/a	n/a	1.5		n/a J
S16T035500		79-01-6		Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5		n/a U
S16T035500		75-69-4		Trichlorofluoromethane	NGS	110	<1.6	7.0	n/a	n/a	n/a	n/a	1.6		n/a J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-G
Customer Sample ID: 16-08765-2-EFF-G

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035500			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035500			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035500			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035500			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-H
Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035501		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
S16T035501		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
S16T035501		75-34-3		1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035501		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
S16T035501		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
S16T035501		542-75-6		1,3-Dichloropropene (Total)	NGS		<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035501		108-46-7		1,4-Dichlorobenzene	NGS	100	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035501		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
S16T035501		71-36-3		1-Butanol	NGS	140	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	UYa
S16T035501		111-70-6		1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035501		71-23-8		1-Propanol	NGS	120	<3.0	13	n/a	n/a	n/a	n/a	3.0	n/a	J
S16T035501		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
S16T035501		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
S16T035501		78-93-3		2-Butanone	NGS	94	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035501		110-43-0		2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501		591-78-6		2-Hexanone	NGS	90	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035501		534-22-5		2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035501		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
S16T035501		106-35-4		3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501		106-68-3		3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035501		105-42-0		4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035501		108-10-1		4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035501		67-64-1		Acetone	NGS	88	<4.3	7.2	n/a	n/a	n/a	n/a	4.3	n/a	J
S16T035501		75-05-8		Acetonitrile	NGS	84	<1.8	25	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035501		98-86-2		Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035501		107-13-1		Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035501		107-18-6		Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035501		107-05-1		Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-H

Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035501			71-43-2	Benzene	NGS	95	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035501			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035501			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035501			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035501			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035501			87-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035501			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035501			64-17-5	Ethanol	NGS	120	<7.4	100	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035501			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			110-54-3	Hexane	NGS	95	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035501			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035501			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035501			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035501			110-59-8	Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			107-12-0	Propanenitrile	NGS	96	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035501			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035501			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			127-18-4	Tetrachloroethene	NGS	100	<1.6	10	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035501			108-88-3	Toluene	NGS	92	<1.5	1.7	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035501			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035501			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	9.2	n/a	n/a	n/a	n/a	1.6	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-H
Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035501			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035501			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035501			142-82-5	n-Heptane	NGS	92	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035501			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-IN-A

Customer Sample ID: 16-08765-2-IN-A

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035502			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
S16T035502			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
S16T035502			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035502			75-35-4	1,1-Dichloroethane	NGS	95	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035502			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
S16T035502			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
S16T035502			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
S16T035502			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
S16T035502			71-36-3	1-Butanol	NGS	140	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035502			111-70-6	1-Heptanol	NGS	91	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035502			71-23-8	1-Propanol	NGS	120	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035502			108-47-4	2,4-Dimethylpyridine	NGS	100	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035502			1708-29-8	2,5-Dihydrofuran	NGS	94	<1.9	8.8	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035502			78-93-3	2-Butanone	NGS	91	<1.6	2.6	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035502			110-43-0	2-Heptanone	NGS	90	<1.2	2.0	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035502			591-78-6	2-Hexanone	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035502			534-22-5	2-Methylfuran	NGS	89	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035502			78-94-4	3-Buten-2-one	NGS	93	<1.5	2.4	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035502			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035502			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035502			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	4.2	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035502			67-64-1	Acetone	NGS	88	<4.3	70	n/a	n/a	n/a	n/a	4.3	n/a	
S16T035502			75-05-8	Acetonitrile	NGS	84	<1.8	25	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035502			98-86-2	Acetophenone	NGS	91	<2.6	3.0	n/a	n/a	n/a	n/a	2.6	n/a	J
S16T035502			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035502			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035502			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
 SDG Number:
 Customer Sample ID: 16-08765-2-IN-A
 Customer Sample ID: 16-08765-2-IN-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035502			71-43-2	Benzene	NGS	95	<1.2	2.8	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035502			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035502			123-72-8	Butanal	NGS	110	<2.1	5.2	n/a	n/a	n/a	n/a	2.1	n/a	J
S16T035502			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035502			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035502			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035502			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035502			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035502			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035502			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035502			64-17-5	Ethanol	NGS	120	<7.4	210	n/a	n/a	n/a	n/a	7.4	n/a	
S16T035502			141-78-6	Ethyl acetate	NGS	82	<1.5	1.9	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035502			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035502			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035502			110-54-3	Hexane	NGS	95	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	
S16T035502			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035502			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035502			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	LU
S16T035502			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035502			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035502			110-59-8	Pentanenitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035502			107-12-0	Propanenitrile	NGS	96	<1.4	2.2	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035502			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035502			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035502			127-18-4	Tetrachloroethene	NGS	100	<1.6	34	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035502			108-88-3	Toluene	NGS	92	<1.5	6.3	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035502			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035502			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	14	n/a	n/a	n/a	n/a	1.6	n/a	

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-IN-A
Customer Sample ID: 16-08765-2-IN-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035502			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035502			123-96-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035502			142-82-5	n-Heptane	NGS	92	<1.4	15	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035502			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-IN-H

Customer Sample ID: 16-08765-2-IN-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035503			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
S16T035503			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
S16T035503			75-34-3	1,1-Dichloroethane	NGS	98	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035503			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
S16T035503			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
S16T035503			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
S16T035503			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
S16T035503			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
S16T035503			71-36-3	1-Butanol	NGS	140	<8.9	320	n/a	n/a	n/a	n/a	8.9	n/a	Ya
S16T035503			111-70-6	1-Heptanol	NGS	91	<5.6	<5.6	n/a	n/a	n/a	n/a	5.6	n/a	U
S16T035503			71-23-8	1-Propanol	NGS	120	<3.0	30	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035503			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
S16T035503			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
S16T035503			78-93-3	2-Butanone	NGS	94	<1.9	7.5	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035503			110-43-0	2-Heptanone	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			591-78-6	2-Hexanone	NGS	90	<1.2	1.2	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035503			534-22-5	2-Methylfuran	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035503			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
S16T035503			106-35-4	3-Heptanone	NGS	93	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			106-68-3	3-Octanone	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035503			105-42-0	4-Methyl-2-hexanone	NGS	90	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035503			108-10-1	4-Methyl-2-Pentanone	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035503			67-64-1	Acetone	NGS	88	<4.3	26	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035503			75-05-8	Acetonitrile	NGS	84	<1.8	27	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035503			98-86-2	Acetophenone	NGS	91	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035503			107-13-1	Acrylonitrile	NGS	92	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035503			107-18-6	Allyl Alcohol	NGS	110	<3.9	<3.9	n/a	n/a	n/a	n/a	3.9	n/a	U
S16T035503			107-05-1	Allyl Chloride	NGS	89	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-IN-H
Customer Sample ID: 16-08765-2-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035503			71-43-2	Benzene	NGS	95	<1.2	2.1	n/a	n/a	n/a	n/a	1.2	n/a	J
S16T035503			100-47-0	Benzonitrile	NGS	92	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035503			123-72-8	Butanal	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035503			109-74-0	Butanenitrile	NGS	99	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U
S16T035503			56-23-5	Carbon tetrachloride	NGS	120	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			108-90-7	Chlorobenzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			75-00-3	Chloroethane	NGS	95	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035503			67-66-3	Chloroform	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			110-82-7	Cyclohexane	NGS	100	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035503			124-18-5	Decane	NGS	84	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035503			64-17-5	Ethanol	NGS	120	<7.4	200	n/a	n/a	n/a	n/a	7.4	n/a	U
S16T035503			141-78-6	Ethyl acetate	NGS	82	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			100-41-4	Ethylbenzene	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			110-00-9	Furan	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			110-54-3	Hexane	NGS	95	<1.7	15	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035503			628-73-9	Hexanenitrile	NGS	96	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			126-98-7	Methacrylonitrile	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			75-09-2	Methylene Chloride	NGS	97	3.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	LU
S16T035503			91-20-3	Naphthalene	NGS	91	<3.7	<3.7	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035503			98-95-3	Nitrobenzene	NGS	92	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035503			110-59-8	Pentanitrile	NGS	91	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			107-12-0	Propanenitrile	NGS	96	<1.4	2.0	n/a	n/a	n/a	n/a	1.4	n/a	J
S16T035503			110-86-1	Pyridine	NGS	130	<3.8	<3.8	n/a	n/a	n/a	n/a	3.8	n/a	U
S16T035503			100-42-5	Styrene	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035503			127-18-4	Tetrachloroethene	NGS	100	<1.6	4.5	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035503			108-88-3	Toluene	NGS	92	<1.5	4.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035503			79-01-6	Trichloroethene	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035503			75-69-4	Trichlorofluoromethane	NGS	110	<1.6	12	n/a	n/a	n/a	n/a	1.6	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-IN-H
Customer Sample ID: 16-08765-2-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035503			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035503			123-86-4	n-Butyl acetate	NGS	78	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035503			142-82-5	n-Heptane	NGS	92	<1.4	14	n/a	n/a	n/a	n/a	1.4	n/a	
S16T035503			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<1.2	<1.2	n/a	n/a	n/a	n/a	1.2	n/a	U

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VOA3_Comments

DSR.Jar v. 3.0.12
2.7.32

Cartidge Evaluation
12/7/2016 2:13:12PM

Verification QC Analysis Comments
Analysis: S1610060049-000 Method: VAPOR-TDU VOA #2
Matrix: VAPOR Replicate: 0
Y = 1-Butanol failed the % criteria in the MDL study.
Analysis: S1610110017-000 Method: VAPOR-TDU VOA #2
Matrix: VAPOR Replicate: 0
Y = 1-Butanol failed the % criteria in the MDL study.
Analysis: S1610110018-000 Method: VAPOR-TDU VOA #2
Matrix: VAPOR Replicate: 0
Y = 1-Butanol MDL Failure

Verification Sample Comments
Sample: S16T035494 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035495 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035496 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035497 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035498 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035499 Group: 20163065
Y = 1-Butanol MDL Failure
Sample: S16T035500 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035501 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035502 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.
Sample: S16T035503 Group: 20163065
Y = 1-Butanol failed the % criteria in the MDL study.

John Dug
12/8/16

Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-A

Customer Sample ID: 16-08765-2-EFF-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035494				Unknown-1	-	4.72	NGS	34 JT	
S16T035494				Unknown-2	-	8.31	NGS	150 JT	
S16T035494				Unknown-3	-	9.08	NGS	26 JT	
S16T035494				Limonene	138-86-3	22.61	NGS	27 JNT	
S16T035494				Unknown-4	-	24.22	NGS	95 JT	
S16T035494				Dodecane	112-40-3	25.26	NGS	12 JNT	
S16T035494				Benzothiazole	95-16-9	26.33	NGS	48 JNT	
S16T035494				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.43	NGS	14 JNT	
S16T035494			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035494			BLNK	Unknown-2	-	25.22	NGS	54	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-B

Customer Sample ID: 16-08765-2-EFF-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035495				Unknown-1	-	8.29	NGS	150 JT	
S16T035495				Limonene	138-86-3	22.61	NGS	35 JNT	
S16T035495				Unknown-2	-	24.22	NGS	100 JT	
S16T035495				Dodecane	112-40-3	25.25	NGS	18 JNT	
S16T035495				2-Propenoic acid, octyl ester	2499-59-4	25.99	NGS	32 JNT	
S16T035495				Methanamine	100-97-0	26.21	NGS	15 JNT	
S16T035495				Benzothiazole	95-16-9	26.33	NGS	64 JNT	
S16T035495				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.42	NGS	28 JNT	
S16T035495				2,2,4-Trimethyl-1,3-pentanediol	6846-50-0	26.56	NGS	80 JNT	
S16T035495			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035495			BLNK	Unknown-2	-	25.22	NGS	54	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-C

Customer Sample ID: 16-08765-2-EFF-C

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035496				Unknown-1	-	8.28	NGS	110 JT	
S16T035496				Limonene	138-86-3	22.61	NGS	35 JNT	
S16T035496				Unknown-2	-	24.23	NGS	130 JT	
S16T035496				Dodecane	112-40-3	25.25	NGS	29 JNT	
S16T035496				Unknown-3	-	26.00	NGS	130 JT	
S16T035496				Methenamine	100-97-0	26.22	NGS	45 JNT	
S16T035496				Benzothiazole	95-16-9	26.34	NGS	84 JNT	
S16T035496				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.43	NGS	26 JNT	
S16T035496				2,2,4-Trimethyl-1,3-pentanediol	6846-50-0	26.55	NGS	67 JNT	
S16T035496			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035496			BLNK	Unknown-2	-	25.22	NGS	54	

Y - Comment
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U - Less Than Detection Limit
T - Tentatively Identified Compound

NA = Not Analyzed, ND = Not Detected
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L - ILS Outside Range

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-D

Customer Sample ID: 16-08765-2-EFF-D

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035497				Unknown-1	-	8.30	NGS	220 JT	
S16T035497				Limonene	138-86-3	22.61	NGS	28 JNT	
S16T035497				Unknown-2	-	24.22	NGS	78 JT	
S16T035497				Dodecane	112-40-3	25.26	NGS	9.1 JNT	
S16T035497				Methanamine	100-97-0	26.21	NGS	25 JNT	
S16T035497				Benzothiazole	95-16-9	26.33	NGS	44 JNT	
S16T035497				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.42	NGS	14 JNT	
S16T035497				Unknown-3	-	26.56	NGS	39 JT	
S16T035497			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035497			BLNK	Unknown-2	-	25.22	NGS	54	

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L - LLS Outside Range

U - Less Than Detection Limit
T - Tentatively Identified Compound

E - Outside Calibration Range
J - Estimated

Y - Comment
a - LCS Outside Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-E

Customer Sample ID: 16-08765-2-EFF-E

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035498				Methyl formate	107-31-3	4.73	NGS	44	JNT
S16T035498				Unknown-1	-	8.31	NGS	240	JT
S16T035498				Limonene	138-86-3	22.61	NGS	30	JNT
S16T035498				Unknown-2	-	24.23	NGS	85	JT
S16T035498				Dodecane	112-40-3	25.25	NGS	14	JNT
S16T035498				Methenamine	100-97-0	26.22	NGS	95	JNT
S16T035498				Benzothiazole	95-16-9	26.35	NGS	69	JNT
S16T035498				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.43	NGS	23	JNT
S16T035498				Unknown-3	-	26.56	NGS	44	JT
S16T035498		BLNK		Unknown-1	-	25.05	NGS	46	
S16T035498		BLNK		Unknown-2	-	25.22	NGS	54	

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L - LLS Outside Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20163065
SDG Number:
Customer Sample ID: 16-08765-2-EFF-F
Customer Sample ID: 16-08765-2-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035499				Methyl formate	107-31-3	4.72	NGS	90 JNT	
S16T035499				Unknown-1	-	8.31	NGS	300 JT	
S16T035499				Decane, 2,4,6-trimethyl-	62108-27-4	22.97	NGS	6.0 JNT	
S16T035499				Undecane	1120214	23.71	NGS	8.8 JNT	
S16T035499				Unknown-2	-	24.22	NGS	85 JT	
S16T035499				Dodecane	112-40-3	25.25	NGS	16 JNT	
S16T035499				Unknown-3	-	26.01	NGS	38 JT	
S16T035499				Methenamine	100-97-0	26.22	NGS	180 JNT	
S16T035499				Benzothiazole	95-16-9	26.35	NGS	49 JNT	
S16T035499				Dodecane, 4,6-dimethyl-	61141728	26.43	NGS	16 JNT	
S16T035499				Tetradecane	629594	27.01	NGS	7.8 JNT	
S16T035499			BLNK	Unknown-1	-	25.07	NGS	31	

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-G

Customer Sample ID: 16-08765-2-EFF-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035500				Methyl formate	107-31-3	4.73	NGS	59	JNT
S16T035500				Unknown-1	-	8.28	NGS	120	JT
S16T035500				Unknown-2	-	20.43	NGS	73	JT
S16T035500				Limonene	138-86-3	22.61	NGS	34	JNT
S16T035500				Undecane	1120-21-4	22.97	NGS	86	JNT
S16T035500				Decane, 2-methyl-	6975-98-0	23.12	NGS	34	JNT
S16T035500				Undecane, 4,7-dimethyl-	17301-32-5	23.83	NGS	77	JNT
S16T035500				Undecane, 5,7-dimethyl-	17312-83-3	23.93	NGS	32	JNT
S16T035500				Unknown-3	-	24.04	NGS	29	JT
S16T035500				Unknown-4	-	24.22	NGS	130	JT
S16T035500				Dodecane	112-40-3	25.25	NGS	29	JNT
S16T035500				Methenamine	100-97-0	26.20	NGS	290	JNT
S16T035500				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.42	NGS	28	JNT
S16T035500		BLNK		Unknown-1	-	25.05	NGS	46	
S16T035500		BLNK		Unknown-2	-	25.22	NGS	54	

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Cartridge Evaluation Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-EFF-H

Customer Sample ID: 16-08765-2-EFF-H

Sample#	R	Al#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035501				Methyl formate	107-31-3	4.73	NGS	60	JNT
S16T035501				Unknown-1	--	8.29	NGS	140	JT
S16T035501				Unknown-2	--	24.22	NGS	54	JT
S16T035501				Methenamine	100-97-0	26.22	NGS	280	JNT
S16T035501				Benzothiazole	95-16-9	26.34	NGS	39	JNT
S16T035501				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.43	NGS	7.7	JNT
S16T035501			BLNK	Unknown-1	--	25.05	NGS	46	
S16T035501			BLNK	Unknown-2	--	25.22	NGS	54	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-IN-A

Customer Sample ID: 16-08765-2-IN-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035502				Unknown-1	-	4.72	NGS	110 JT	
S16T035502				Unknown-2	-	8.29	NGS	130 JT	
S16T035502				Tetrahydrofuran	109-99-9	11.98	NGS	20 JNT	
S16T035502				N-Nitrosodimethylamine	62-75-9	15.69	NGS	28 JNT	
S16T035502				Unknown-3	-	20.44	NGS	27 JT	
S16T035502				D-Limonene	5989-27-5	22.61	NGS	35 JNT	
S16T035502				Unknown-4	-	24.23	NGS	120 JT	
S16T035502				Dodecane	112-40-3	25.25	NGS	19 JNT	
S16T035502				Methanamine	100-97-0	26.20	NGS	330 JNT	
S16T035502				Benzothiazole	95-16-9	26.33	NGS	45 JNT	
S16T035502				Dodecane, 2,6,11-trimethyl-	31295-56-4	26.42	NGS	19 JNT	
S16T035502				Unknown-5	-	26.56	NGS	37 JT	
S16T035502			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035502			BLNK	Unknown-2	-	25.22	NGS	54	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163065

SDG Number:

Customer Sample ID: 16-08765-2-IN-H
Customer Sample ID: 16-08765-2-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035503				Methyl formate	107-31-3	4.72	NGS	78	JNT
S16T035503				Unknown-1	-	8.28	NGS	130	JT
S16T035503				Tetrahydrofuran	109-99-9	11.97	NGS	17	JNT
S16T035503				N-Nitrosodimethylamine	62-75-9	15.69	NGS	38	JNT
S16T035503				Unknown-2	-	24.22	NGS	53	JT
S16T035503				Dodecane	112-40-3	25.25	NGS	12	JNT
S16T035503				Methenamine	100-97-0	26.21	NGS	240	JNT
S16T035503				Benzothiazole	95-16-9	26.34	NGS	32	JNT
S16T035503				Unknown-3	-	26.55	NGS	57	JT
S16T035503			BLNK	Unknown-1	-	25.05	NGS	46	
S16T035503			BLNK	Unknown-2	-	25.22	NGS	54	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-A

Customer Sample ID: 16-08766-2-EFF-A

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Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035530			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035530			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035530			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035530			75-35-4	1,1-Dichloroethene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035530			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035530			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035530			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035530			71-36-3	1-Butanol	NGS	120	<4.3	5.7	n/a	n/a	n/a	n/a	4.3	n/a	JL
S16T035530			111-70-6	1-Heptanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035530			71-23-8	1-Propanol	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035530			108-47-4	2,4-Dimethylpyridine	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035530			1708-29-8	2,5-Dihydrofuran	NGS	130	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035530			78-93-3	2-Butanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035530			110-43-0	2-Heptanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035530			591-78-6	2-Hexanone	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035530			534-22-5	2-Methylfuran	NGS	100	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035530			78-94-4	3-Buten-2-one	NGS	98	<2.7	4.6	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035530			106-35-4	3-Heptanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035530			106-68-3	3-Octanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035530			105-42-0	4-Methyl-2-hexanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035530			108-10-1	4-Methyl-2-pentanone	NGS	97	<2.8	5.4	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035530			67-64-1	Acetone	NGS	100	<1.6	7.1E+03	n/a	n/a	n/a	n/a	1.6	n/a	EY
S16T035530			75-05-8	Acetonitrile	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035530			98-86-2	Acetophenone	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035530			107-13-1	Acrylonitrile	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035530			107-18-6	Allyl Alcohol	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035530			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-A

Customer Sample ID: 16-08766-2-EFF-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035530			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035530			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035530			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035530			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035530			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035530			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035530			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035530			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035530			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035530			64-17-5	Ethanol	NGS	110	<3.7	10	n/a	n/a	n/a	n/a	3.7	n/a	J
S16T035530			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035530			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035530			110-54-3	Hexane	NGS	100	<1.3	3.0	n/a	n/a	n/a	n/a	1.3	n/a	J
S16T035530			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035530			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			75-09-2	Methylene Chloride	NGS	100	<4.1	16	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035530			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035530			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035530			110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035530			107-12-0	Propanenitrile	NGS	110	<2.8	3.2	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035530			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035530			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035530			127-18-4	Tetrachloroethene	NGS	110	<1.8	17	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			108-88-3	Toluene	NGS	100	<2.2	3.2	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T035530			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035530			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-A

Customer Sample ID: 16-08766-2-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035530			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035530			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035530			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035530			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

E - Outside Calibration Range
J - Estimated

T - Tentatively Identified Compound
N - Named TIC

U - Less Than Detection Limit
Y - Comment

NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-B

Customer Sample ID: 16-08766-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035531			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035531			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035531			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035531			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035531			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035531			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035531			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035531			71-36-3	1-Butanol	NGS	120	<4.3	5.4	n/a	n/a	n/a	n/a	4.3	n/a	JL
S16T035531			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035531			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035531			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035531			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035531			78-93-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035531			110-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035531			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035531			534-22-5	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035531			78-94-4	3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035531			106-35-4	3-Heptanone	NGS	100	<2.7	4.7	n/a	n/a	n/a	n/a	2.7	n/a	J
S16T035531			106-68-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035531			105-42-0	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035531			108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035531			67-84-1	Acetone	NGS	97	<2.8	19	n/a	n/a	n/a	n/a	2.8	n/a	
S16T035531			75-05-8	Acetonitrile	NGS	100	<1.6	49	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035531			98-86-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035531			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035531			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035531			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-B

Customer Sample ID: 16-08766-2-EFF-B

Sample#	R	AF	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035531			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035531			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035531			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035531			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035531			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035531			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035531			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035531			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035531			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035531			64-17-5	Ethanol	NGS	110	<3.7	25	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035531			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035531			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035531			110-54-3	Hexane	NGS	100	<1.3	2.2	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035531			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035531			128-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			75-09-2	Methylene Chloride	NGS	100	<4.1	9.5	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035531			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035531			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035531			110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035531			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035531			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035531			127-18-4	Tetrachloroethene	NGS	110	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			108-88-3	Toluene	NGS	100	<2.2	2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035531			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035531			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	2.2	n/a	n/a	n/a	n/a	1.9	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-B
Customer Sample ID: 16-08766-2-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035531			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035531			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035531			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035531			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-C

Customer Sample ID: 16-08766-2-EFF-C

Sample#	R	AW	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035532			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035532			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035532			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035532			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035532			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035532			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035532			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035532			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	LU
S16T035532			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035532			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035532			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035532			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035532			78-93-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035532			110-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035532			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035532			534-22-5	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035532			78-94-4	3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035532			106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035532			106-68-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035532			105-42-0	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035532			108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035532			67-84-1	Acetone	NGS	97	<2.8	3.7	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035532			75-05-8	Acetonitrile	NGS	100	<1.6	40	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035532			98-86-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035532			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035532			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035532			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-C

Customer Sample ID: 16-08766-2-EFF-C

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035532			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035532			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035532			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035532			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035532			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035532			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035532			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035532			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035532			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035532			64-17-5	Ethanol	NGS	110	<3.7	43	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035532			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035532			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035532			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035532			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035532			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035532			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035532			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035532			110-59-8	Pentanitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035532			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035532			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035532			127-18-4	Tetrachloroethene	NGS	110	<1.8	20	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035532			108-88-3	Toluene	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035532			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035532			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	4.1	n/a	n/a	n/a	n/a	1.9	n/a	J

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L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-C
Customer Sample ID: 16-08766-2-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035532			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035532			123-98-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035532			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035532			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Y - Comment
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L - LLS Outside Range

Cartridge Evaluation
Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-D
Customer Sample ID: 16-08766-2-EFF-D

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035533		79-34-5		1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035533		79-00-5		1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035533		75-34-3		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035533		75-35-4		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035533		107-06-2		1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035533		542-75-6		1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533		106-46-7		1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035533		123-91-1		1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035533		71-36-3		1-Butanol	NGS	120	<4.3	6.4	n/a	n/a	n/a	n/a	4.3	n/a	JL
S16T035533		111-70-6		1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035533		71-23-8		1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035533		108-47-4		2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035533		1708-29-8		2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035533		78-93-3		2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035533		110-43-0		2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035533		591-78-6		2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035533		534-22-5		2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035533		78-94-4		3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035533		106-35-4		3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035533		106-88-3		3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035533		105-42-0		4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035533		108-10-1		4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035533		67-84-1		Acetone	NGS	97	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035533		75-05-8		Acetonitrile	NGS	100	<1.6	62	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035533		98-96-2		Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035533		107-13-1		Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035533		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035533		107-05-1		Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-D
Customer Sample ID: 16-08766-2-EFF-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035533			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035533			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035533			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035533			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035533			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035533			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035533			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035533			87-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035533			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035533			64-17-5	Ethanol	NGS	110	<3.7	58	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035533			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035533			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035533			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035533			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035533			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035533			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035533			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035533			110-59-8	Pentanitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035533			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035533			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035533			127-18-4	Tetrachloroethene	NGS	110	<1.8	16	n/a	n/a	n/a	n/a	1.8	n/a	
S16T035533			108-88-3	Toluene	NGS	100	<2.2	2.6	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T035533			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035533			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	5.4	n/a	n/a	n/a	n/a	1.9	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-D

Customer Sample ID: 16-08766-2-EFF-D

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035533			10061-01-5	dis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035533			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035533			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035533			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-E

Customer Sample ID: 16-08766-2-EFF-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035534			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035534			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035534			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035534			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035534			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035534			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035534			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035534			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035534			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035534			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035534			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035534			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035534			78-93-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035534			110-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035534			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035534			534-22-5	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035534			78-94-4	3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035534			106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035534			106-68-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035534			105-42-0	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035534			108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035534			67-64-1	Acetone	NGS	97	<2.8	4.4	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035534			75-05-8	Acetonitrile	NGS	100	<1.6	86	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035534			98-96-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035534			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035534			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035534			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-E

Customer Sample ID: 16-08766-2-EFF-E

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035534			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035534			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035534			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035534			108-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035534			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035534			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035534			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035534			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035534			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035534			64-17-5	Ethanol	NGS	110	<3.7	41	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035534			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035534			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035534			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035534			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035534			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035534			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035534			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035534			110-59-8	Pentanitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035534			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035534			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035534			127-18-4	Tetrachloroethene	NGS	110	<1.8	11	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035534			108-88-3	Toluene	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035534			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035534			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	4.4	n/a	n/a	n/a	n/a	1.9	n/a	J

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NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-E
Customer Sample ID: 16-08766-2-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035534			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035534			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035534			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035534			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-F
Customer Sample ID: 16-08766-2-EFF-F

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035535		79-34-5		1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035535		79-00-5		1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035535		75-34-3		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035535		75-35-4		1,2-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035535		107-06-2		1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035535		542-75-6		1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535		106-46-7		1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035535		123-91-1		1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035535		71-38-3		1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035535		111-70-6		1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035535		71-23-8		1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035535		108-47-4		2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035535		1708-29-8		2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035535		78-93-3		2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035535		110-43-0		2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035535		591-78-6		2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035535		534-22-5		2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035535		78-94-4		3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035535		106-35-4		3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035535		106-68-3		3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035535		105-42-0		4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035535		108-10-1		4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035535		67-64-1		Acetone	NGS	97	<2.8	12	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035535		75-05-8		Acetonitrile	NGS	100	<1.6	120	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035535		98-86-2		Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035535		107-13-1		Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035535		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035535		107-05-1		Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-F

Customer Sample ID: 16-08766-2-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035535			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035535			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035535			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035535			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035535			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035535			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035535			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035535			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035535			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035535			64-17-5	Ethanol	NGS	110	<3.7	61	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035535			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035535			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035535			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035535			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035535			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035535			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035535			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035535			110-59-8	Pentanitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035535			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035535			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035535			127-18-4	Tetrachloroethene	NGS	110	<1.8	8.3	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035535			108-88-3	Toluene	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035535			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035535			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	6.4	n/a	n/a	n/a	n/a	1.9	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-F
Customer Sample ID: 16-08766-2-EFF-F

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TOU VOA #2															
S16T035535			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035535			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035535			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035535			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-G
Customer Sample ID: 16-08766-2-EFF-G

Sample#	R	AP	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035536			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035536			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035536			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035536			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035536			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035536			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035536			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035536			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035536			71-36-3	1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	U
S16T035536			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035536			71-23-8	1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035536			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035536			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035536			78-93-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035536			110-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035536			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035536			534-22-5	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035536			78-94-4	3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035536			106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035536			106-68-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035536			105-42-0	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035536			108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035536			67-64-1	Acetone	NGS	97	<2.8	13	n/a	n/a	n/a	n/a	2.8	n/a	
S16T035536			75-05-8	Acetonitrile	NGS	100	<1.6	86	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035536			98-86-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035536			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035536			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035536			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-G
Customer Sample ID: 16-08766-2-EFF-G

Sample#	R	Ad	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035536			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035536			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035536			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035536			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035536			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035536			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035536			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035536			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035536			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035536			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035536			64-17-5	Ethanol	NGS	110	<3.7	52	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035536			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035536			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035536			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035536			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035536			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035536			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035536			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035536			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035536			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035536			110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035536			107-12-0	Propanenitrile	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035536			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035536			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035536			127-18-4	Tetrachloroethene	NGS	110	<1.8	6.0	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035536			108-88-3	Toluene	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035536			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035536			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	5.8	n/a	n/a	n/a	n/a	1.9	n/a	J

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-G
Customer Sample ID: 16-08766-2-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035536			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035536			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035536			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035536			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-H
Customer Sample ID: 16-08766-2-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035537		79-34-5		1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035537		79-00-5		1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035537		75-34-3		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035537		75-35-4		1,1-Dichloroethene	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035537		107-06-2		1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035537		542-75-6		1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537		106-46-7		1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035537		123-91-1		1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035537		71-36-3		1-Butanol	NGS	120	<4.3	<4.3	n/a	n/a	n/a	n/a	4.3	n/a	LU
S16T035537		111-70-6		1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035537		71-23-8		1-Propanol	NGS	110	<8.9	<8.9	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035537		108-47-4		2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035537		1708-29-8		2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035537		78-93-3		2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035537		110-43-0		2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035537		591-78-6		2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035537		534-22-5		2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035537		78-94-4		3-Buten-2-one	NGS	98	<1.9	<1.9	n/a	n/a	n/a	n/a	1.9	n/a	U
S16T035537		106-35-4		3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035537		106-68-3		3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035537		105-42-0		4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035537		108-10-1		4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035537		67-84-1		Acetone	NGS	97	<2.8	3.4	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035537		75-05-8		Acetonitrile	NGS	100	<1.6	56	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035537		98-96-2		Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035537		107-13-1		Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035537		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035537		107-05-1		Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-H
Customer Sample ID: 16-08766-2-EFF-H

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035537			71-43-2	Benzene	NGS	100	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035537			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035537			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035537			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035537			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035537			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035537			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035537			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035537			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035537			64-17-5	Ethanol	NGS	110	<3.7	76	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035537			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035537			110-00-9	Furan	NGS	92	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035537			110-54-3	Hexane	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035537			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035537			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035537			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035537			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035537			110-59-8	Pentanitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035537			107-12-0	Propanenitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			110-86-1	Pyridine	NGS	110	<2.8	<2.8	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035537			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035537			127-18-4	Tetrachloroethene	NGS	110	<1.8	8.0	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			108-88-3	Toluene	NGS	100	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035537			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035537			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	8.0	n/a	n/a	n/a	n/a	1.9	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-EFF-H
Customer Sample ID: 16-08766-2-EFF-H

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035537			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035537			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035537			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035537			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-A

Customer Sample ID: 16-08766-2-IN-A

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035538			79-34-5	1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035538			79-00-5	1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035538			75-34-3	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035538			75-35-4	1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035538			107-06-2	1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	1.7	n/a	U
S16T035538			542-75-6	1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035538			106-46-7	1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035538			123-91-1	1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	2.0	n/a	U
S16T035538			71-36-3	1-Butanol	NGS	120	<4.3	310	n/a	n/a	n/a	n/a	4.3	n/a	L
S16T035538			111-70-6	1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	9.1	n/a	U
S16T035538			71-23-8	1-Propanol	NGS	110	<8.9	25	n/a	n/a	n/a	n/a	8.9	n/a	U
S16T035538			108-47-4	2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035538			1708-29-8	2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035538			78-93-3	2-Butanone	NGS	100	<3.1	<3.1	n/a	n/a	n/a	n/a	3.1	n/a	U
S16T035538			110-43-0	2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035538			591-78-6	2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035538			534-22-5	2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035538			78-94-4	3-Buten-2-one	NGS	98	<1.9	11	n/a	n/a	n/a	n/a	1.9	n/a	J
S16T035538			106-35-4	3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035538			106-68-3	3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035538			105-42-0	4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035538			108-10-1	4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	2.2	n/a	U
S16T035538			67-84-1	Acetone	NGS	97	<2.8	89	n/a	n/a	n/a	n/a	2.8	n/a	U
S16T035538			75-05-8	Acetonitrile	NGS	100	<1.6	110	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035538			98-86-2	Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	6.2	n/a	U
S16T035538			107-13-1	Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035538			107-18-6	Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	2.3	n/a	U
S16T035538			107-05-1	Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-A

Customer Sample ID: 16-08766-2-IN-A

Sample#	R	AI	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035538			71-43-2	Benzene	NGS	100	<1.5	3.0	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035538			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035538			123-72-8	Butanal	NGS	110	<3.0	4.4	n/a	n/a	n/a	n/a	3.0	n/a	JU
S16T035538			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035538			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035538			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035538			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035538			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035538			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035538			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035538			64-17-5	Ethanol	NGS	110	<3.7	330	n/a	n/a	n/a	n/a	3.7	n/a	
S16T035538			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035538			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035538			110-00-9	Furan	NGS	92	<1.6	5.9	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035538			110-54-3	Hexane	NGS	100	<1.3	21	n/a	n/a	n/a	n/a	1.3	n/a	
S16T035538			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035538			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035538			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035538			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035538			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035538			110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035538			107-12-0	Propanenitrile	NGS	110	<2.8	2.6	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035538			110-86-1	Pyridine	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035538			100-42-5	Styrene	NGS	110	<1.8	4.7	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035538			127-18-4	Tetrachloroethene	NGS	110	<1.8	7.6	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035538			108-88-3	Toluene	NGS	100	<2.2	2.6	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T035538			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035538			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	15	n/a	n/a	n/a	n/a	1.9	n/a	

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J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-A

Customer Sample ID: 16-08766-2-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035538			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035538			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035538			142-82-5	n-Heptane	NGS	100	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035538			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Y - Comment

NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-H

Customer Sample ID: 16-08766-2-IN-H

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR:TDU VOA #2															
S16T035539		79-34-5		1,1,2,2-Tetrachloroethane	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		79-00-5		1,1,2-Trichloroethane	NGS	110	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		75-34-3		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		75-35-4		1,1-Dichloroethane	NGS	100	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		107-06-2		1,2-Dichloroethane	NGS	110	<1.7	<1.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		542-75-6		1,3-Dichloropropene (Total)	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		108-46-7		1,4-Dichlorobenzene	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		123-91-1		1,4-Dioxane	NGS	110	<2.0	<2.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		71-36-3		1-Butanol	NGS	120	<4.3	290	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		111-70-6		1-Heptanol	NGS	110	<9.1	<9.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		71-23-8		1-Propanol	NGS	110	<8.9	17	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		108-47-4		2,4-Dimethylpyridine	NGS	110	<4.1	<4.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		1708-29-8		2,5-Dihydrofuran	NGS	130	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		78-93-3		2-Butanone	NGS	100	<3.1	6.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		110-43-0		2-Heptanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		591-78-6		2-Hexanone	NGS	100	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		534-22-5		2-Methylfuran	NGS	100	<1.3	<1.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		78-94-4		3-Buten-2-one	NGS	98	<1.9	9.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		106-35-4		3-Heptanone	NGS	100	<2.7	<2.7	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		106-68-3		3-Octanone	NGS	100	<3.3	<3.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		105-42-0		4-Methyl-2-hexanone	NGS	100	<2.6	<2.6	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		108-10-1		4-Methyl-2-Pentanone	NGS	110	<2.2	<2.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		67-64-1		Acetone	NGS	97	<2.8	31	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		75-05-8		Acetonitrile	NGS	100	<1.6	140	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		98-86-2		Acetophenone	NGS	110	<6.2	<6.2	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		107-13-1		Acrylonitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		107-18-6		Allyl Alcohol	NGS	120	<2.3	<2.3	n/a	n/a	n/a	n/a	n/a	n/a	n/a
S16T035539		107-05-1		Allyl Chloride	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a

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Y - Comment

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L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-H

Customer Sample ID: 16-08766-2-IN-H

Sample#	R	AI#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035539			71-43-2	Benzene	NGS	100	<1.5	3.5	n/a	n/a	n/a	n/a	1.5	n/a	J
S16T035539			100-47-0	Benzonitrile	NGS	100	<4.2	<4.2	n/a	n/a	n/a	n/a	4.2	n/a	U
S16T035539			123-72-8	Butanal	NGS	110	<3.0	<3.0	n/a	n/a	n/a	n/a	3.0	n/a	U
S16T035539			109-74-0	Butanenitrile	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U
S16T035539			56-23-5	Carbon tetrachloride	NGS	110	<1.5	<1.5	n/a	n/a	n/a	n/a	1.5	n/a	U
S16T035539			108-90-7	Chlorobenzene	NGS	110	<2.5	<2.5	n/a	n/a	n/a	n/a	2.5	n/a	U
S16T035539			75-00-3	Chloroethane	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035539			67-66-3	Chloroform	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035539			110-82-7	Cyclohexane	NGS	110	<1.4	<1.4	n/a	n/a	n/a	n/a	1.4	n/a	U
S16T035539			124-18-5	Decane	NGS	110	<3.3	<3.3	n/a	n/a	n/a	n/a	3.3	n/a	U
S16T035539			64-17-5	Ethanol	NGS	110	<3.7	180	n/a	n/a	n/a	n/a	3.7	n/a	U
S16T035539			141-78-6	Ethyl acetate	NGS	90	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035539			100-41-4	Ethylbenzene	NGS	110	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035539			110-00-9	Furan	NGS	92	<1.6	5.7	n/a	n/a	n/a	n/a	1.6	n/a	J
S16T035539			110-54-3	Hexane	NGS	100	<1.3	21	n/a	n/a	n/a	n/a	1.3	n/a	U
S16T035539			628-73-9	Hexanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035539			126-98-7	Methacrylonitrile	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035539			75-09-2	Methylene Chloride	NGS	100	<4.1	<4.1	n/a	n/a	n/a	n/a	4.1	n/a	U
S16T035539			91-20-3	Naphthalene	NGS	110	<5.3	<5.3	n/a	n/a	n/a	n/a	5.3	n/a	U
S16T035539			98-95-3	Nitrobenzene	NGS	120	<4.7	<4.7	n/a	n/a	n/a	n/a	4.7	n/a	U
S16T035539			110-59-8	Pentanenitrile	NGS	110	<2.6	<2.6	n/a	n/a	n/a	n/a	2.6	n/a	U
S16T035539			107-12-0	Propanenitrile	NGS	110	<1.8	2.3	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035539			110-86-1	Pyridine	NGS	110	<2.8	4.5	n/a	n/a	n/a	n/a	2.8	n/a	J
S16T035539			100-42-5	Styrene	NGS	110	<2.7	<2.7	n/a	n/a	n/a	n/a	2.7	n/a	U
S16T035539			127-18-4	Tetrachloroethene	NGS	110	<1.8	2.7	n/a	n/a	n/a	n/a	1.8	n/a	J
S16T035539			108-88-3	Toluene	NGS	100	<2.2	2.8	n/a	n/a	n/a	n/a	2.2	n/a	J
S16T035539			79-01-6	Trichloroethene	NGS	110	<1.6	<1.6	n/a	n/a	n/a	n/a	1.6	n/a	U
S16T035539			75-69-4	Trichlorofluoromethane	NGS	110	<1.9	13	n/a	n/a	n/a	n/a	1.9	n/a	U

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068
SDG Number:
Customer Sample ID: 16-08766-2-IN-H
Customer Sample ID: 16-08766-2-IN-H

Sample#	R	Alt	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
VAPOR-TDU VOA #2															
S16T035539			10061-01-5	cis-1,3-Dichloropropene	NGS	110	<1.8	<1.8	n/a	n/a	n/a	n/a	1.8	n/a	U
S16T035539			123-86-4	n-Butyl acetate	NGS	89	<2.4	<2.4	n/a	n/a	n/a	n/a	2.4	n/a	U
S16T035539			142-82-5	n-Heptane	NGS	100	<1.6	17	n/a	n/a	n/a	n/a	1.6	n/a	
S16T035539			10061-02-6	trans-1,3-Dichloropropene	NGS	110	<2.1	<2.1	n/a	n/a	n/a	n/a	2.1	n/a	U

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-A

Customer Sample ID: 16-08766-2-EFF-A

Sample#	R	Ad	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035530				Unknown-1	-	7.83	NGS	190 JT	
S16T035530				2,2,7,7-Tetramethyloctane	1071-31-4	21.43	NGS	62 JNT	
S16T035530				Octane, 2,3,6,7-tetramethyl-	52670-34-5	22.05	NGS	130 JNT	
S16T035530				Heptane, 2,2,4,6,6-pentamethyl	13475-82-6	22.60	NGS	52 JNT	
S16T035530				Heptane, 4-ethyl-2,2,6,6-tetra	62108-31-0	22.67	NGS	59 JNT	
S16T035530				Undecane, 3-methyl-	1002-43-3	23.02	NGS	41 JNT	
S16T035530				Undecane, 2,6-dimethyl-	17301-23-4	23.59	NGS	13 JNT	
S16T035530				Unknown-2	-	23.77	NGS	68 JT	
S16T035530				Methanamine	100-97-0	25.73	NGS	34 JNT	
S16T035530				Benzothiazole	95-16-9	25.84	NGS	51 JNT	

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J - Estimated

Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-B

Customer Sample ID: 16-08766-2-EFF-B

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035531				Methyl Acetate	79-20-9	7.13	NGS	35 JNT	
S16T035531				Unknown-1	-	7.87	NGS	210 JT	
S16T035531				2,2,6-Trimethyloctane	62016-28-8	19.88	NGS	59 JNT	
S16T035531				2,2-Dimethyldecane	17302-37-3	21.46	NGS	79 JNT	
S16T035531				Dodecane, 2,6,10-trimethyl-	3891-88-3	22.08	NGS	150 JNT	
S16T035531				Decane, 2,4,6-trimethyl-	62108-27-4	22.45	NGS	22 JNT	
S16T035531				Decane, 2,5,9-trimethyl-	62108-22-9	22.62	NGS	61 JNT	
S16T035531				Octane, 3,6-dimethyl-	15869-94-0	22.68	NGS	69 JNT	
S16T035531				Decane, 3,7-dimethyl-	17312-54-8	23.04	NGS	47 JNT	
S16T035531				Heptane, 3,3-dimethyl-	4032-86-4	23.36	NGS	28 JNT	
S16T035531				Unknown-2	-	23.78	NGS	46 JT	
S16T035531				Methanamine	100-97-0	25.74	NGS	47 JNT	
S16T035531				Benzothiazole	95-16-9	25.85	NGS	34 JNT	

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Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-C

Customer Sample ID: 16-08766-2-EFF-C

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035532				Unknown-1	-	7.87	NGS	270 JT	
S16T035532				Unknown-2	-	23.80	NGS	72 JT	
S16T035532				Methanamine	100-97-0	25.76	NGS	34 JNT	
S16T035532				Benzothiazole	95-16-9	25.86	NGS	67 JNT	
S16T035532				Decane, 2,4,6-trimethyl-	82108-27-4	25.96	NGS	18 JNT	

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Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-D

Customer Sample ID: 16-08766-2-EFF-D

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035533				Unknown-1	-	7.87	NGS	280 JT	
S16T035533				Decane, 2,6,6-trimethyl-	82108-24-1	22.08	NGS	45 JNT	
S16T035533				Benzoic acid, 2-(trimethylsil	3789-85-3	23.78	NGS	41 JNT	
S16T035533				Methenamine	100-97-0	25.74	NGS	57 JNT	
S16T035533				Benzothiazole	95-16-9	25.85	NGS	28 JNT	

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-E

Customer Sample ID: 16-08766-2-EFF-E

Sample#	R	Alt	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035534				Unknown-1	-	7.87	NGS	290 JT	
S16T035534				Benzoic acid, 2-(trimethylsilyl	3789-85-3	23.80	NGS	30 JNT	
S16T035534				Methenamine	100-97-0	25.75	NGS	76 JNT	
S16T035534				Benzothiazole	95-16-9	25.86	NGS	38 JNT	

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-F

Customer Sample ID: 16-08766-2-EFF-F

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035535				Methyl Acetate	79-20-9	7.12	NGS	45 JNT	
S16T035535				Unknown-1	-	7.87	NGS	270 JT	
S16T035535				Unknown-2	-	23.78	NGS	47 JT	
S16T035535				Decane, 2,4,6-trimethyl-	82-108-27-4	24.84	NGS	13 JNT	
S16T035535				Methenamine	100-97-0	25.74	NGS	120 JNT	
S16T035535				Benzothiazole	95-16-9	25.85	NGS	43 JNT	

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-G

Customer Sample ID: 16-08766-2-EFF-G

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035536				Methyl Acetate	79-20-9	7.12	NGS	45	JNT
S16T035536				Unknown-1	-	7.86	NGS	250	JT
S16T035536				Cycloletrasiloxane, octamethyl	556-67-2	19.88	NGS	32	JNT
S16T035536				2,6-Dimethyldecane	13150-81-7	22.43	NGS	47	JNT
S16T035536				Decane, 2,4,6-trimethyl-	62108-27-4	22.60	NGS	18	JNT
S16T035536				Undecane, 5,7-dimethyl-	17312-83-3	23.37	NGS	38	JNT
S16T035536				Undecane, 4,7-dimethyl-	17301-32-5	23.48	NGS	25	JNT
S16T035536				Unknown-2	-	23.79	NGS	50	JT
S16T035536				Methenamine	100-97-0	25.74	NGS	200	JNT

E - Outside Calibration Range
J - Estimated

T - Tentatively Identified Compound
N - Named TIC

U - Less Than Detection Limit
Y - Comment

NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-EFF-H

Customer Sample ID: 16-08766-2-EFF-H

Sample#	R	As	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035537				Unknown-1	-	7.85	NGS	200 JT	
S16T035537				Unknown-2	-	23.79	NGS	28 JT	
S16T035537				Methanamine	100-97-0	25.74	NGS	310 JNT	
S16T035537				1,2-Benzisothiazole	272-16-2	25.85	NGS	31 JNT	

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

Cartridge Evaluation
Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-A

Customer Sample ID: 16-08766-2-IN-A

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035538				Formamide	75-12-7	5.87	NGS	54	JNT
S16T035538				Methyl Acetate	79-20-9	7.15	NGS	34	JNT
S16T035538				Unknown-1	-	7.95	NGS	120	JT
S16T035538				Tetrahydrofuran	109-99-9	11.64	NGS	27	JNT
S16T035538				Hexane, 3-methyl-	589-34-4	14.14	NGS	26	JNT
S16T035538				Cyclohexene, 1-methyl-5-(1-met	1461-27-4	21.98	NGS	32	JNT
S16T035538				Unknown-2	-	23.79	NGS	88	JT
S16T035538				Carbamic acid, butylmethyl-, p	54644-61-0	25.39	NGS	33	JNT
S16T035538				Benzothiazole	95-16-9	25.86	NGS	79	JNT
S16T035538				Decane, 2,4,6-trimethyl-	82108-27-4	25.96	NGS	30	JNT
S16T035538				Hydroxylamine, O-decyl-	29812-79-1	26.10	NGS	32	JNT

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

Cartridge Evaluation Data Summary Report

Sample Group: 20163068

SDG Number:

Customer Sample ID: 16-08766-2-IN-H

Customer Sample ID: 16-08766-2-IN-H

Sample#	R	A#	QC Type	Analyte	CAS No.	Retention Time (Minutes)	Unit	Result	Qual Flags
VAPOR-TDU VOA #2									
S16T035539				Unknown-1	-	7.86	NGS	100 JT	
S16T035539				Tetrahydrofuran	109-99-9	11.62	NGS	31 JNT	
S16T035539				Formamide	75-12-7	13.74	NGS	31 JNT	
S16T035539				Unknown-2	-	23.79	NGS	30 JT	
S16T035539				Methanamine	100-97-0	25.74	NGS	180 JNT	
S16T035539				Benzothiazole	95-16-9	25.85	NGS	41 JNT	

E - Outside Calibration Range
J - Estimated

T - Tentatively Identified Compound
N - Named TIC

U - Less Than Detection Limit
Y - Comment

NA = Not Analyzed, ND = Not Detected
L - LLS Outside Range

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Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-BASE-EI:F

Customer Sample ID: 16-08765-3-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035359			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035359			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035359			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035359			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035359			534-22-5	2-Methylfuran	NGS	95	<0.15	0.16	n/a	n/a	n/a	n/a	0.15	n/a	J
S16T035359			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035359			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035359			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035359			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-BASE-IN
Customer Sample ID: 16-08765-3-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035360			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035360			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.49	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035360			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035360			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035360			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035360			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035360			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035360			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035360			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit
J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-BLANK1
Customer Sample ID: 16-08765-3-BLANK1

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035361			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035361			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035361			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035361			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035361			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035361			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035361			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035361			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035361			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-BLANK2
Customer Sample ID: 16-08765-3-BLANK2

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035362			1191-99-7	2,3-Dihydrofuran	NGS	76	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035362			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.65	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035362			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035362			3777-71-7	2-Heptylfuran	NGS	95	<0.38	0.52	n/a	n/a	n/a	n/a	0.38	n/a	J
S16T035362			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035362			3777-69-3	2-Pentylfuran	NGS	91	<0.29	0.41	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035362			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035362			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035362			109-99-9	Tetrahydrofuran	NGS	100	<0.31	0.64	n/a	n/a	n/a	n/a	0.31	n/a	J

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-A

Customer Sample ID: 16-08765-3-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035363			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035363			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035363			825-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035363			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035363			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035363			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035363			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035363			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035363			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-B

Customer Sample ID: 16-08765-3-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035364			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T035364			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T035364			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T035364			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T035364			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T035364			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T035364			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T035364			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T035364			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-C

Customer Sample ID: 16-08765-3-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035365			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035365			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035365			825-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035365			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035365			534-22-5	2-Methylfuran	NGS	95	<0.15	0.31	n/a	n/a	n/a	n/a	0.15	n/a	J
S16T035365			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035365			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035365			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035365			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-EFF-D
Customer Sample ID: 16-08765-3-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035366			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035366			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035366			825-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035366			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035366			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035366			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035366			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035366			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035366			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-E

Customer Sample ID: 16-08765-3-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035367			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035367			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035367			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035367			3771-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035367			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035367			3771-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035367			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035367			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035367			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-F

Customer Sample ID: 16-08765-3-EFF-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035368			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035368			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035368			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035368			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035368			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035368			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035368			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035368			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035368			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-EFF-G
Customer Sample ID: 16-08765-3-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035369			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035369			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035369			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035369			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035369			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035369			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035369			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035369			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035369			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-EFF-H

Customer Sample ID: 16-08765-3-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035370			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035370			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035370			825-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035370			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035370			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035370			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035370			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035370			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035370			109-99-9	Tetrahydrofuran	NGS	100	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061

SDG Number:

Customer Sample ID: 16-08765-3-IN-A

Customer Sample ID: 16-08765-3-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035371			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035371			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.75	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035371			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035371			3777-71-7	2-Hepylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035371			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035371			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035371			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035371			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035371			109-99-9	Tetrahydrofuran	NGS	100	<0.31	27	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
 SDG Number:
 Customer Sample ID: 16-08765-3-IN-B
 Customer Sample ID: 16-08765-3-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035372			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035372			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	1.2	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035372			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035372			3777-71-7	2-Hepylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035372			534-22-5	2-Methylfuran	NGS	95	<0.15	0.15	n/a	n/a	n/a	n/a	0.15	n/a	J
S16T035372			3777-89-3	2-Pentylfuran	NGS	91	<0.29	0.69	n/a	n/a	n/a	n/a	0.29	n/a	J
S16T035372			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035372			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035372			109-99-9	Tetrahydrofuran	NGS	100	<0.31	20	n/a	n/a	n/a	n/a	0.31	n/a	U

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-C
Customer Sample ID: 16-08765-3-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035373			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035373			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035373			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035373			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035373			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035373			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035373			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035373			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035373			109-89-9	Tetrahydrofuran	NGS	100	<0.31	21	n/a	n/a	n/a	n/a	0.31	n/a	U

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-D
Customer Sample ID: 16-08765-3-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035374			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035374			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.47	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035374			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035374			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035374			534-22-5	2-Methylfuran	NGS	95	<0.15	0.17	n/a	n/a	n/a	n/a	0.15	n/a	J
S16T035374			3777-89-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035374			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035374			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035374			109-99-9	Tetrahydrofuran	NGS	100	<0.31	27	n/a	n/a	n/a	n/a	0.31	n/a	U

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-E
Customer Sample ID: 16-08765-3-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans In Vapor Samples by SIM															
S16T035375			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035375			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.48	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035375			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035375			3777-71-7	2-Hepylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035375			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035375			3777-89-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035375			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035375			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035375			109-99-9	Tetrahydrofuran	NGS	100	<0.31	31	n/a	n/a	n/a	n/a	0.31	n/a	

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-F
Customer Sample ID: 16-08765-3-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035376			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035376			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	0.89	n/a	n/a	n/a	n/a	0.45	n/a	J
S16T035376			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035376			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035376			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035376			3777-89-3	2-Pentylfuran	NGS	91	<0.29	0.66	n/a	n/a	n/a	n/a	0.29	n/a	J
S16T035376			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035376			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035376			109-99-9	Tetrahydrofuran	NGS	100	<0.31	26	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

J - Estimated

U - Less Than Detection Limit

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-G
Customer Sample ID: 16-08765-3-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035377			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035377			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035377			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035377			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035377			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035377			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035377			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035377			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035377			109-99-9	Tetrahydrofuran	NGS	100	<0.31	5.6	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163061
SDG Number:
Customer Sample ID: 16-08765-3-IN-H
Customer Sample ID: 16-08765-3-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035378			1191-99-7	2,3-Dihydrofuran	NGS	78	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035378			1708-29-8	2,5-Dihydrofuran	NGS	110	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035378			625-86-5	2,5-Dimethylfuran	NGS	89	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035378			3777-71-7	2-Heptylfuran	NGS	95	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035378			534-22-5	2-Methylfuran	NGS	95	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035378			3777-69-3	2-Pentylfuran	NGS	91	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035378			4229-91-8	2-Propylfuran	NGS	90	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035378			110-00-9	Furan	NGS	100	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035378			109-99-9	Tetrahydrofuran	NGS	100	<0.31	34	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

U - Less Than Detection Limit

J - Estimated

Open
11/29/16

**Cartridge Evaluation
Data Summary Report**

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-BASE-EFF

Customer Sample ID: 16-08766-3-BASE-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035379			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035379			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035379			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035379			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035379			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035379			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035379			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035379			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035379			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-BASE-IN

Customer Sample ID: 16-08766-3-BASE-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035380			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035380			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035380			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035380			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035380			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035380			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035380			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035380			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035380			109-99-9	Tetrahydrofuran	NGS	85	<0.31	0.76	n/a	n/a	n/a	n/a	0.31	n/a	J

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-BLANK-EFF

Customer Sample ID: 16-08766-3-BLANK-EFF

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035381			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035381			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035381			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035381			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035381			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035381			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035381			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035381			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035381			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-BLANK-IN

Customer Sample ID: 16-08766-3-BLANK-IN

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035382			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035382			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035382			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035382			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035382			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035382			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035382			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035382			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035382			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-A

Customer Sample ID: 16-08766-3-EFF-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035383			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035383			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035383			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035383			3777-71-7	2-Heptylfuran	NGS	100	<0.38	0.63	n/a	n/a	n/a	n/a	0.38	n/a	J
S16T035383			534-22-5	2-Methylfuran	NGS	90	<0.15	0.18	n/a	n/a	n/a	n/a	0.15	n/a	J
S16T035383			3777-69-3	2-Pentylfuran	NGS	100	<0.29	0.68	n/a	n/a	n/a	n/a	0.29	n/a	J
S16T035383			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035383			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035383			109-99-9	Tetrahydrofuran	NGS	85	<0.31	0.63	n/a	n/a	n/a	n/a	0.31	n/a	J

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-B

Customer Sample ID: 16-08766-3-EFF-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spt Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035384			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035384			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035384			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035384			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035384			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035384			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035384			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035384			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035384			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-C

Customer Sample ID: 16-08766-3-EFF-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035385			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035385			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035385			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035385			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035385			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035385			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035385			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035385			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035385			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-D

Customer Sample ID: 16-08766-3-EFF-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035386			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T035386			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T035386			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T035386			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T035386			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T035386			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T035386			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T035386			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T035386			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31		n/a U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-E

Customer Sample ID: 16-08766-3-EFF-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035387			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035387			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035387			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035387			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035387			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035387			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035387			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035387			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035387			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-G

Customer Sample ID: 16-08766-3-EFF-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035389			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035389			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035389			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035389			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035389			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035389			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035389			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035389			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035389			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-EFF-H

Customer Sample ID: 16-08766-3-EFF-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035390			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035390			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035390			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035390			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035390			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035390			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035390			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035390			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035390			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-A

Customer Sample ID: 16-08766-3-IN-A

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035391			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035391			1708-29-8	2,5-Dihydrofuran	NGS	88	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035391			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035391			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035391			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035391			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035391			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035391			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035391			109-99-9	Tetrahydrofuran	NGS	85	<0.31	<0.31	n/a	n/a	n/a	n/a	0.31	n/a	U

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-B

Customer Sample ID: 16-08766-3-IN-B

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035392			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	UY
S16T035392			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	UY
S16T035392			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	UY
S16T035392			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	UY
S16T035392			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	UY
S16T035392			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	UY
S16T035392			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	UY
S16T035392			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	UY
S16T035392			109-99-9	Tetrahydrofuran	NGS	85	<0.31	29	n/a	n/a	n/a	n/a	0.31	n/a	Y

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-C

Customer Sample ID: 16-08766-3-IN-C

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035393			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035393			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035393			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035393			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035393			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035393			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035393			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035393			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035393			109-99-9	Tetrahydrofuran	NGS	85	<0.31	26	n/a	n/a	n/a	n/a	0.31	n/a	

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-D

Customer Sample ID: 16-08766-3-IN-D

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035394			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32		n/a U
S16T035394			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45		n/a U
S16T035394			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26		n/a U
S16T035394			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38		n/a U
S16T035394			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15		n/a U
S16T035394			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29		n/a U
S16T035394			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21		n/a U
S16T035394			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58		n/a U
S16T035394			109-99-9	Tetrahydrofuran	NGS	85	<0.31	33	n/a	n/a	n/a	n/a	0.31		n/a

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation
Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-E

Customer Sample ID: 16-08766-3-IN-E

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035395			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035395			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035395			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035395			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035395			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035395			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035395			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035395			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035395			109-99-9	Tetrahydrofuran	NGS	85	<0.31	34	n/a	n/a	n/a	n/a	0.31	n/a	

Y - Comment

U - Less Than Detection Limit

J - Estimated

NA = Not Analyzed, ND = Not Detected

Cartridge Evaluation Data Summary Report

Sample Group: 20163062

SDG Number:

Customer Sample ID: 16-08766-3-IN-F

Customer Sample ID: 16-08766-3-IN-F

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035396			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035396			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035396			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035396			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035396			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035396			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035396			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035396			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035396			109-99-9	Tetrahydrofuran	NGS	85	<0.31	28	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163062
SDG Number:
Customer Sample ID: 16-08766-3-IN-G
Customer Sample ID: 16-08766-3-IN-G

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035397			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035397			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035397			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035397			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035397			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035397			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035397			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035397			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035397			109-99-9	Tetrahydrofuran	NGS	85	<0.31	34	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

Cartridge Evaluation Data Summary Report

Sample Group: 20163062
SDG Number:
Customer Sample ID: 16-08766-3-IN-H
Customer Sample ID: 16-08766-3-IN-H

Sample#	R	A#	CAS #	Analyte	Unit	STD %	Blank	Result	Duplicate	Average	RPD %	Spk Rec %	Det Limit	Cnt Err %	Qual Flags
Furans in Vapor Samples by SIM															
S16T035398			1191-99-7	2,3-Dihydrofuran	NGS	65	<0.32	<0.32	n/a	n/a	n/a	n/a	0.32	n/a	U
S16T035398			1708-29-8	2,5-Dihydrofuran	NGS	89	<0.45	<0.45	n/a	n/a	n/a	n/a	0.45	n/a	U
S16T035398			625-86-5	2,5-Dimethylfuran	NGS	88	<0.26	<0.26	n/a	n/a	n/a	n/a	0.26	n/a	U
S16T035398			3777-71-7	2-Heptylfuran	NGS	100	<0.38	<0.38	n/a	n/a	n/a	n/a	0.38	n/a	U
S16T035398			534-22-5	2-Methylfuran	NGS	90	<0.15	<0.15	n/a	n/a	n/a	n/a	0.15	n/a	U
S16T035398			3777-69-3	2-Pentylfuran	NGS	100	<0.29	<0.29	n/a	n/a	n/a	n/a	0.29	n/a	U
S16T035398			4229-91-8	2-Propylfuran	NGS	100	<0.21	<0.21	n/a	n/a	n/a	n/a	0.21	n/a	U
S16T035398			110-00-9	Furan	NGS	90	<0.58	<0.58	n/a	n/a	n/a	n/a	0.58	n/a	U
S16T035398			109-99-9	Tetrahydrofuran	NGS	85	<0.31	31	n/a	n/a	n/a	n/a	0.31	n/a	

NA = Not Analyzed, ND = Not Detected

Y - Comment

U - Less Than Detection Limit

J - Estimated

C.3.4 Amines



ANALYTICAL REPORT

Report Date: October 19, 2016

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

Phone: (509) 373-1262

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20163059

Workorder: **34-1627934**

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

Analytical Results

Sample ID: S16T035274		Collected: 10/01/2016		
Lab ID: 1627934001		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
		Analyzed: 10/17/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035275		Collected: 10/01/2016		
Lab ID: 1627934002		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 10/17/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035276		Collected: 10/01/2016		
Lab ID: 1627934003		Received: 10/05/2016		
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
		Analyzed: 10/17/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

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ANALYTICAL REPORT

Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035277		Collected: 10/01/2016		
Lab ID: 1627934004		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]		
Analyzed: 10/17/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035278		Collected: 10/01/2016		
Lab ID: 1627934005		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
Analyzed: 10/17/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035279		Collected: 10/01/2016		
Lab ID: 1627934006		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
Analyzed: 10/17/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035280		Collected: 10/01/2016		
Lab ID: 1627934007		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube		
		50/100mg [(NBD) Chloride]		
Analyzed: 10/17/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035281		Collected: 10/01/2016		
Lab ID: 1627934008	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035282		Collected: 10/01/2016		
Lab ID: 1627934009	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035283		Collected: 10/01/2016		
Lab ID: 1627934010	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035284		Collected: 10/01/2016		
Lab ID: 1627934011	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035285		Collected: 10/01/2016		
Lab ID: 1627934012	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035286		Collected: 10/01/2016		
Lab ID: 1627934013	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	0.73	NA	NA	0.10

Sample ID: S16T035287		Collected: 10/01/2016		
Lab ID: 1627934014	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	2.1	NA	NA	0.10

Sample ID: S16T035288		Collected: 10/01/2016		
Lab ID: 1627934015	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	5.4	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035289		Collected: 10/01/2016		
Lab ID: 1627934016	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	3.1	NA	NA	0.10
Methylamine	6.4	NA	NA	0.10

Sample ID: S16T035290		Collected: 10/01/2016		
Lab ID: 1627934017	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	5.5	NA	NA	0.10

Sample ID: S16T035291		Collected: 10/01/2016		
Lab ID: 1627934018	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	5.2	NA	NA	0.10

Sample ID: S16T035292		Collected: 10/01/2016		
Lab ID: 1627934019	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



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Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035293		Collected: 10/01/2016		
Lab ID: 1627934020	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	3.0	NA	NA	0.10
Methylamine	2.3	NA	NA	0.10

Sample ID: S16T035294		Collected: 10/02/2016		
Lab ID: 1627934021	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/17/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035295		Collected: 10/02/2016		
Lab ID: 1627934022	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035296		Collected: 10/02/2016		
Lab ID: 1627934023	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



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Workorder: 34-1627934

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Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035297		Collected: 10/02/2016		
Lab ID: 1627934024	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035298		Collected: 10/02/2016		
Lab ID: 1627934025	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035299		Collected: 10/02/2016		
Lab ID: 1627934026	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035300		Collected: 10/02/2016		
Lab ID: 1627934027	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



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Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035301		Collected: 10/02/2016		
Lab ID: 1627934028	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035302		Collected: 10/02/2016		
Lab ID: 1627934029	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035303		Collected: 10/02/2016		
Lab ID: 1627934030	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035304		Collected: 10/02/2016		
Lab ID: 1627934031	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035305		Collected: 10/02/2016		
Lab ID: 1627934032	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	<0.10	NA	NA	0.10

Sample ID: S16T035306		Collected: 10/02/2016		
Lab ID: 1627934033	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	2.2	NA	NA	0.10

Sample ID: S16T035307		Collected: 10/02/2016		
Lab ID: 1627934034	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	3.4	NA	NA	0.10

Sample ID: S16T035308		Collected: 10/02/2016		
Lab ID: 1627934035	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	2.6	NA	NA	0.10
Methylamine	5.3	NA	NA	0.10



ANALYTICAL REPORT

Workorder: 34-1627934

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035309		Collected: 10/02/2016		
Lab ID: 1627934036	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	2.9	NA	NA	0.10
Methylamine	7.1	NA	NA	0.10

Sample ID: S16T035310		Collected: 10/02/2016		
Lab ID: 1627934037	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	0.16	NA	NA	0.10
Ethylamine	2.0	NA	NA	0.10
Methylamine	5.9	NA	NA	0.10

Sample ID: S16T035311		Collected: 10/02/2016		
Lab ID: 1627934038	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	4.3	NA	NA	0.10

Sample ID: S16T035312		Collected: 10/02/2016		
Lab ID: 1627934039	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	4.3	NA	NA	0.10



ANALYTICAL REPORT

Workorder: **34-1627934**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035313		Collected: 10/02/2016		
Lab ID: 1627934040	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: Amines-VOA Aliphatic VAA-1		Media: SKC 226-96, XAD-7 Tube 50/100mg [(NBD) Chloride]	Analyzed: 10/18/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Dimethylamine	<0.10	NA	NA	0.10
Ethylamine	<0.10	NA	NA	0.10
Methylamine	3.6	NA	NA	0.10

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

Method	Analyst	Peer Review
Amines-VOA Aliphatic VAA-1	/S/ Christopher Winter 10/18/2016 16:48	/S/ Thomas Bosch 10/19/2016 10:33

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1627934**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627934

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH Aliphatic Amines
Batch: ILC/12907 (HBN: 178564)
Analyzed By: Christopher Winter

Blank

LMB: 522670			
Analyzed: 10/17/2016 16:39			
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: 522671					LCSD: 522672			
Analyzed: 10/17/2016 16:55					Analyzed: 10/17/2016 17:10			
Dilution: 1					Dilution: 1			
Units: ug/sample					Units: ug/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Dimethylamine	4.02	4.00	100	60.4 134.6	4.12	103	2.68	0.0 20.0
Ethylamine	4.48	4.00	112	40.0 160.0	4.76	119	6.09	0.0 20.0
Methylamine	4.42	4.00	111	40.0 160.0	4.40	110	0.567	0.0 20.0

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

Analyst	Peer Review
/S/ Christopher Winter 10/18/2016 16:28	/S/ Thomas Bosch 10/19/2016 10:29

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: 1627934

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH Aliphatic Amines
Batch: ILC/12908 (HBN: 178565)
Analyzed By: Christopher Winter

Blank

LMB: 522673 Analyzed: 10/17/2016 23:04 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: 522674 Analyzed: 10/17/2016 23:19 Dilution: 1 Units: ug/sample					LCSD: 522675 Analyzed: 10/17/2016 23:34 Dilution: 1 Units: ug/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Dimethylamine	4.03	4.00	101	60.4 134.6	4.00	99.9	0.822	0.0 20.0
Ethylamine	4.50	4.00	112	40.0 160.0	4.53	113	0.709	0.0 20.0
Methylamine	4.33	4.00	108	40.0 160.0	4.37	109	0.896	0.0 20.0

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

Analyst	Peer Review
/S/ Christopher Winter 10/18/2016 16:48	/S/ Thomas Bosch 10/19/2016 10:33

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



1627934

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A		C.O.C. No. 20163059		Page 1 of 4					
Collector JONES		Contact/Requestor CARL HOWARD IV		Telephone No. 373-6861		MSIN 76-05 FAX 372-1878			
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 233003/C920					
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A		Ice Chest No. WTS-047		Temp. 60 INE			
Shipped To (Lab) ALS		Method of Shipment		Bill of Lading/Air Bill No. 7773 8817 9518					
Protocol N/A		Data Turnaround 10 DAYS		Parts and Return No. 41402					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
1	S16T035274	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EASE-EFF	N/A			
2	S16T035275	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EASE-IN	N/A			
3	S16T035276	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-BLANK1	N/A			
4	S16T035277	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-BLANK2	N/A			
5	S16T035278	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-A	N/A			
6	S16T035279	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-B	N/A			
7	S16T035280	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-C	N/A			
8	S16T035281	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-D	N/A			
9	S16T035282	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-E	N/A			
10	S16T035283	VA	10/01/16	XAD-7-NBD	AMINES 16-08765-4-EFF-F	N/A			

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
Send Results to Carl Howard IV & Greg
Scanlan howardiv@rl.gov and
Gregory_L_Scanlan@rl.gov see SOX for email
CONTRACT 55502

Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
TERESA FORRESTER			10/14/16 1400	Re Received By			10/14/16 10:00	S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid WI = Wipe SL = Sludge L = Liquid W = Water V = Vegetation VA = Vapor X = Other DS = Drum Solids
Relinquished By			10/14/16 1400	Received By			10/14/16 1400	
Relinquished By			10/14/16 1400	Received By			10/14/16 1400	
Relinquished By			10/14/16 1400	Received By			10/14/16 1400	

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By
Emilie R Pratt

Date/Time
10/13/16 17:00

A-6003-962 (03/05)

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20163059	
Collector JONES		Contact/Requestor CARL HOWARD IV		Telephone No. 373-6861		Page 2 of 4	
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 203003/0920		MSIN 76-05 FAX 372-1878	
Project Title CARTRIDGE EVALUATION		Logbook Work Package No. N/A		Ice Chest No. 45047		Temp. 04 ICE	
Shipped To (Lab) ALS		Method of Shipment		Bill of Lading/Air Bill No. 7773 8817 9518			
Protocol N/A		Data Turnaround 10 DAYS		Parts and Return No. 41402			
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
11	S16T035284	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-EFF-G	N/A	
12	S16T035285	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-EFF-H	N/A	
13	S16T035286	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-A	N/A	
14	S16T035287	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-B	N/A	
15	S16T035288	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-C	N/A	
16	S16T035289	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-D	N/A	
17	S16T035290	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-E	N/A	
18	S16T035291	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-F	N/A	
19	S16T035292	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-G	N/A	
20	S16T035293	VA 10/01/16		XAD-7-NBD	AMINES 16-08765-4-IN-H	N/A	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV & Greg Scanlan howaldg1.gov and gregory_l_scanlan@1.gov see SOW for email CONTRACT 55502 Hold Time							
Relinquished By TERESA FORRESTER	Print TERESA FORRESTER	Sign TERESA FORRESTER	Date/Time 10/4/16 10:00	Received By RECEIVED	Sign RECEIVED	Date/Time 10/4/16 10:00	Matrix* S = Soil DL = Drum Liquids SE = Sediment T = Tissue SL = Sludge W = Wipe W = Water L = Liquid O = Oil V = Vegetation A = Air VA = Vapor DS = Drum Solids X = Other
Relinquished By TERESA FORRESTER	Print TERESA FORRESTER	Sign TERESA FORRESTER	Date/Time 10/4/16 1400	Received By RECEIVED	Sign RECEIVED	Date/Time 10/4/16 10:30	
Relinquished By TERESA FORRESTER	Print TERESA FORRESTER	Sign TERESA FORRESTER	Date/Time 10/4/16 1400	Received By RECEIVED	Sign RECEIVED	Date/Time 10/4/16 10:30	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)							Date/Time 10/13/16 17:00

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20163059	
		Telephone No. 373-6861		MSIN 76-05		Page 3 of 4	
Collector JONES		Contact/Requestor CARL HOWARD IV		Purchase Order/Charge Code 203003/CB20		FAX 372-1878	
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION		Ice Chest No. <i>WTS-047</i>		Temp. <i>ON ICE</i>	
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A		Bill of Lading/Air Bill No. <i>7773 8817 9518</i>			
Shipped To (Lab) ALS		Method of Shipment		Parts and Return No. <i>41402</i>			
Protocol N/A		Data Turnaround 10 DAYS					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
21	S16T035294	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-BASE-EFF	N/A	
22	S16T035295	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-BASE-IN	N/A	
23	S16T035296	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-BLANK-EFF	N/A	
24	S16T035297	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-BLANK-IN	N/A	
25	S16T035298	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-A	N/A	
26	S16T035299	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-B	N/A	
27	S16T035300	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-C	N/A	
28	S16T035301	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-D	N/A	
29	S16T035302	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-E	N/A	
30	S16T035303	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-F	N/A	

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
Send Results to Carl Howard IV & Greg
Carl Howard IV
Gregory L. Scanlan
Gregory L. Scanlan@rl.gov see SOW for email
CONTRACT 55502

Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
TERESA FORRESTER	<i>[Signature]</i>	<i>[Signature]</i>	10-4-16 1000	RE FORRESTER	<i>[Signature]</i>	<i>[Signature]</i>	10/4/16 10:00	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water V = Vegetation O = Oil X = Air DS = Drum Solids
Relinquished By WVRES	<i>[Signature]</i>	<i>[Signature]</i>	10/4/16 1400	Received By TAMARA TASEL	<i>[Signature]</i>	<i>[Signature]</i>	10-5-16 10:30	DL = Drum Liquids T = Tissue WM = Wipe L = Liquid VA = Vapor X = Other
Relinquished By		<i>[Signature]</i>		Received By				

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By *[Signature]* Date/Time 10/17/16 17:40

FINAL SAMPLE DISPOSITION

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-8003-982 (03/05)

Assembler N/A		C.O.C. No. 20163059			
Collector JONES		Page 4 of 4			
SAF No. N/A		Telephone No. 373-6861 MSIN 76-05 FAX 372-1878			
Project Title CARTRIDGE EVALUATION		Purchase Order/Charge Code 203003/G920			
Shipped To (Lab) ALS		Ice Chest No. 245-947 Temp. 9.2 ICE			
Protocol N/A		Bill of Lading/Air Bill No. 7723 8817 9518			
		Parts and Return No. 41402			

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
31	S16T035304	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-G	N/A
32	S16T035305	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-EFF-H	N/A
33	S16T035306	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-A	N/A
34	S16T035307	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-B	N/A
35	S16T035308	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-C	N/A
36	S16T035309	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-D	N/A
37	S16T035310	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-E	N/A
38	S16T035311	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-F	N/A
39	S16T035312	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-G	N/A
40	S16T035313	VA 10/02/16		XAD-7-NBD	AMINES 16-08766-4-IN-H	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
Send Results to Carl Howald IV & Greg
Scutian Howald@rl.gov and
Gregory_L_Scannia@rl.gov see SCW for email
CONTRACT 55502

Hold Time

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
TEAGLE, ROBERTA			10-4-16 1000	RECEIVED BY			10/4/16 10:00	S = Soil DL = Drum Liquids SE = Sediment T = Tissue SO = Solid WI = Wipe SL = Sludge L = Liquid W = Water V = Vegetation VA = Vapor X = Other DS = Drum Solids
Relinquished By			10/4/16 1200	Received By			10/4/16 10:30	
Relinquished By			10/4/16 1200	Received By			10/4/16 10:30	
Relinquished By			10/4/16 1200	Received By			10/4/16 10:30	

Disposal Method (e.g., Return to customer, per lab procedure, used in process)

Disposed By: [Signature]

DATE/TIME: 10/13/16 17:40

FINAL SAMPLE DISPOSITION

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

C.3.5 Acetonitrile



ANALYTICAL REPORT

Report Date: October 11, 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
20163057

Workorder: **34-1627926**

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

Analytical Results

Sample ID: S16T0353193		Collected: 10/01/2016		
Lab ID: 1627926001		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube		
		400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyzed: 10/07/2016				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353194		Collected: 10/01/2016		
Lab ID: 1627926002		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube		
		400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyzed: 10/07/2016				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353195		Collected: 10/01/2016		
Lab ID: 1627926003		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

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ALS GROUP USA, CORP., An ALS Limited Company

Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353196		Collected: 10/01/2016	
Lab ID: 1627926004	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353197		Collected: 10/01/2016	
Lab ID: 1627926005	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353198		Collected: 10/01/2016	
Lab ID: 1627926006	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353199		Collected: 10/01/2016	
Lab ID: 1627926007	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010

Sample ID: S16T0353200		Collected: 10/01/2016	
Lab ID: 1627926008	Sampling Location: CARTRIDGE EVALUATION	Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
Acetonitrile	<0.010	NA	NA 0.010



ANALYTICAL REPORT

Workorder: 34-1627926

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353201		Collected: 10/01/2016		
Lab ID: 1627926009		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353202		Collected: 10/01/2016		
Lab ID: 1627926010		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353203		Collected: 10/01/2016		
Lab ID: 1627926011		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353204		Collected: 10/01/2016		
Lab ID: 1627926012		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353205		Collected: 10/01/2016		
Lab ID: 1627926013		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353206		Collected: 10/01/2016		
Lab ID: 1627926014		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353207		Collected: 10/01/2016		
Lab ID: 1627926015		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353208		Collected: 10/01/2016		
Lab ID: 1627926016		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353209		Collected: 10/01/2016		
Lab ID: 1627926017		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353210		Collected: 10/01/2016		
Lab ID: 1627926018		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353211		Collected: 10/01/2016		
Lab ID: 1627926019		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353212		Collected: 10/01/2016		
Lab ID: 1627926020		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353213		Collected: 10/02/2016		
Lab ID: 1627926021		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353214		Collected: 10/02/2016		
Lab ID: 1627926022		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353215		Collected: 10/02/2016		
Lab ID: 1627926023		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353216		Collected: 10/02/2016		
Lab ID: 1627926024		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353217		Collected: 10/02/2016		
Lab ID: 1627926025		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353218		Collected: 10/02/2016		
Lab ID: 1627926026		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353219		Collected: 10/02/2016		
Lab ID: 1627926027		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353220		Collected: 10/02/2016		
Lab ID: 1627926028		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353221		Collected: 10/02/2016		
Lab ID: 1627926029		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353222		Collected: 10/02/2016		
Lab ID: 1627926030		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353223		Collected: 10/02/2016		
Lab ID: 1627926031		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353224		Collected: 10/02/2016		
Lab ID: 1627926032		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353225		Collected: 10/02/2016		
Lab ID: 1627926033		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353226		Collected: 10/02/2016		
Lab ID: 1627926034		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353227		Collected: 10/02/2016		
Lab ID: 1627926035		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353228		Collected: 10/02/2016		
Lab ID: 1627926036		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353229		Collected: 10/02/2016		
Lab ID: 1627926037		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353230		Collected: 10/02/2016		
Lab ID: 1627926038		Received: 10/05/2016		
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010



ANALYTICAL REPORT

Workorder: **34-1627926**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T0353231		Collected: 10/02/2016		
Lab ID: 1627926039	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1606	Media: SKC 226-09, Charcoal Tube 400/200mg		Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Sample ID: S16T0353232		Collected: 10/02/2016		
Lab ID: 1627926040	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1606		Media: SKC 226-09, Charcoal Tube 400/200mg	Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
Acetonitrile	<0.010	NA	NA	0.010

Comments

Quality Control: **NIOSH 1606 - (HBN: 177913)**

QC samples 521377, 521378, and 521379 are associated with samples 1627926001-020. QC samples 521380, 521381, and 521382 are associated with samples 1627926021-040.

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

Method	Analyst	Peer Review
NIOSH 1606	/S/ Young Hee Yoon 10/11/2016 14:31	/S/ Thomas J. Masoian 10/11/2016 15:18

Laboratory Contact Information

ALS Environmental
960 W Levoe Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alstlab@ALSGlobal.com
Web: www.alssl.com



ANALYTICAL REPORT

Workorder: **34-1627926**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627926

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: IH GC-FID QC
Batch: IFID/7820 (HBN: 177913)
Analyzed By: Young Hee Yoon

Blank

MB: 521377 Analyzed: 10/07/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

MB: 521380 Analyzed: 10/07/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
Acetonitrile	ND	NA	0.0100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521378 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521379 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Acetonitrile	0.259	0.250	104	86.6 115.3	0.256	103	1.17	0.0 20.0

LCS: 521381 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521382 Analyzed: 10/07/2016 00:00 Dilution: 1 Units: mg/sample			
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits
Acetonitrile	0.305	0.312	97.8	86.6 115.3	0.308	98.7	0.979	0.0 20.0

Comments

QC samples 521377, 521378, and 521379 are associated with samples 1627926001-020. QC samples 521380, 521381, and 521382 are associated with samples 1627926021-040.

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

Analyst	Peer Review
/S/ Young Hee Yoon 10/11/2016 14:31	/S/ Thomas J. Masoian 10/11/2016 15:18

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



1627926

Assembler
N/A

1627926

G.O.C. No. 20163057		Page 1 of 4
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-8861
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 203003/CB20
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ice Chest No. 645-047
Shipped To (Lab) ALS	Method of Shipment	Bill of Lading/Air Bill No. 7773 8807 9518
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41402

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T035193	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-BASE-EFF	N/A
	S16T035194	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-BASE-IN	N/A
	S16T035195	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-BLANK1	N/A
	S16T035196	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-BLANK2	N/A
	S16T035197	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-A	N/A
	S16T035198	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-B	N/A
	S16T035199	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-C	N/A
	S16T035200	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-D	N/A
	S16T035201	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-E	N/A
	S16T035202	VA	10/1/16	CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-F	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
Send Results to Carl Howard IV & Greg Scanlan
Carl W. Howald@rl.gov and Gregory P. Scanlan@rl.gov for email
RELEASE 9
Reference Contract # 55502

Relinquished By TERESA FORRESTER	Print Jules Gradish	Sign Jules Gradish	Received By Jules Gradish	Sign Jules Gradish	Date/Time 10-4-16 1000	Date/Time 10/4/16 1000
Relinquished By WRPS	Print Jules Gradish	Sign Jules Gradish	Received By Jules Gradish	Sign Jules Gradish	Date/Time 10-4-16 1400	Date/Time 10/4/16 1000
Relinquished By	Print	Sign	Received By	Sign	Date/Time	Date/Time
Relinquished By	Print	Sign	Received By	Sign	Date/Time	Date/Time

Disposal Method (e.g., Return to customer, per lab procedure, used in process) *per lab procedure*

Disposed By *per lab procedure*

Date/Time *10-4-16 1400*

FINAL SAMPLE DISPOSITION

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-992 (03/05)

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										C.O.C. No. 20163057	
										Page 2 of 4	
Assembler N/A	Contact/Requestor CARL HOWARD IV									Telephone No. 373-6861	
Collector JONES	Sample Origin CARTRIDGE EVALUATION									Purchase Order/Charge Code 203807/0282	
SAF No. N/A	Logbook/Work Package No. N/A									MSIN 16-02 FAX 372-1878	
Project Title CARTRIDGE EVALUATION	Method of Shipment N/A									Ice Chest No. <i>WTS-047</i> Temp. <i>045 F</i>	
Shipped To (Lab) ALS	Data Turnaround 10 DAYS									Bill of Lading/Air Bill No. <i>7773 8817 9518</i>	
Protocol N/A										Parts and Return No. <i>41402</i>	
Sample No.	Lab ID	*	Date	Time	No./Type Container	Sample Analysis					Preservative
	S16T035203	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-G					N/A
	S16T035204	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-EFF-H					N/A
	S16T035205	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-A					N/A
	S16T035206	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-B					N/A
	S16T035207	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-C					N/A
	S16T035208	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-D					N/A
	S16T035209	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-E					N/A
	S16T035210	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-F					N/A
	S16T035211	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-G					N/A
	S16T035212	VA	10/1/16		CHARCOAL TUBE	Acetonitrile 16-08765-5-IN-H					N/A
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Scanlan Carl W. Howald@rl.gov and Gregory J. Scanlan@rl.gov for email RELEASE 9 Reference Contract # 55502											
Relinquished By <i>TERESA FORRESTIER</i>	Print	Sign	Date/Time <i>10-9-16 1000</i>	Received By <i>Juli Gradish</i>	Print	Sign	Date/Time <i>10-4-16 1000</i>	Marked*			
Relinquished By <i>JA Gradish</i>	Print	Sign	Date/Time <i>10-9-16 1000</i>	Received By <i>Juli Gradish</i>	Print	Sign	Date/Time <i>10-4-16 1000</i>	Marked*			
Relinquished By <i>WRPS</i>	Print	Sign	Date/Time <i>10/1/16 1400</i>	Received By <i>Juli Gradish</i>	Print	Sign	Date/Time <i>10-5-16 10:30</i>	Marked*			
Relinquished By <i>Redeo</i>	Print	Sign	Date/Time <i>10-4-16 1400</i>	Received By <i>Juli Gradish</i>	Print	Sign	Date/Time <i>10-5-16 10:30</i>	Marked*			
Disposal Method (e.g., Return to customer, per lab procedure used in process) <i>41402-16-08765-5-IN-H 04.8, 2016 11:00 AM</i>											
FINAL SAMPLE DISPOSITION Disposed By <i>41402-16-08765-5-IN-H 04.8, 2016 11:00 AM</i>											

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										C.O.C. No. 20163057		
Collector N/A		Telephone No. 373-6861										Page 3 of 4		
SAF No. N/A		Sample Origin CARL HOWARD IV										MSIN 76-02		
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No.										Purchase Order/Charge Code 203003/CS20		
Shipped To (Lab) ALS		Method of Shipment										Ice Chest No. WTS-049		
Protocol N/A		Data Turnaround 10 DAYS										Bill of Lading/Air Bill No. 7738879518		
Sample No.		Lab ID	*	Date	Time	No./Type Container	Sample Analysis					Preservative		
	S16T035213	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-BASE-EFF					N/A		
	S16T035214	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-BASE-IN					N/A		
	S16T035215	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-BLANK-EFF					N/A		
	S16T035216	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-BLANK-IN					N/A		
	S16T035217	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-A					N/A		
	S16T035218	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-B					N/A		
	S16T035219	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-C					N/A		
	S16T035220	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-D					N/A		
	S16T035221	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-E					N/A		
	S16T035222	VA		10/2/16		CHARCOAL TUBE	Acetonitrile 16-08766-5-EFF-F					N/A		
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Scanlan Carl W. Howard@ri.gov and Gregory J. Scanlan@ri.gov for email RELEASE 9 Reference Contract # 55502														
Relinquished By TERESA FORESTER	Print	Sign	Date/Time	Received By Julie Goodwin	Print	Sign	Date/Time	Matrix*	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other					
Relinquished By WRPS	Print	Sign	Date/Time	Received By Julie Goodwin	Print	Sign	Date/Time	Matrix*	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other					
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other					
Disposal Method (e.g., Return to customer, per lab procedure used in process) going to the town of 04, 8, 2016 11:00 AM								Date/Time						
FINAL SAMPLE DISPOSITION Disposed By														

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST										C.O.C. No. 20163057	
										Page 4 of 4	
Assembler N/A	Collector JONES SAF No. N/A Project Title CARTRIDGE EVALUATION Shipped To (Lab) ALS Protocol N/A									Telephone No. 373-6861	MSIN 16-02 FAX 372-1878
Contact/Requestor CARL HOWARD IV										Purchase Order/Charge Code 203007/6320	
Sample Origin CARTRIDGE EVALUATION										Ice Chest No. 645-047 Temp. 0.0 IN	
Logbook/ Work Package No. N/A										Bill of Lading/Air Bill No. 7738879518	
Method of Shipment										Parts and Return No. 41402	
Data Turnaround 10 DAYS											
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative					
	S16T035223	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-BFF-G	N/A					
	S16T035224	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-BFF-H	N/A					
	S16T035225	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-A	N/A					
	S16T035226	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-B	N/A					
	S16T035227	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-C	N/A					
	S16T035228	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-D	N/A					
	S16T035229	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-E	N/A					
	S16T035230	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-F	N/A					
	S16T035231	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-G	N/A					
	S16T035232	VA	10/2/16	CHARCOAL TUBE	Acetonitrile 16-08766-5-IN-H	N/A					
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Scanlan Carl N. Howald@ri.gov and Gregory J. Scanlan@ri.gov for email RELEASE 9 Reference Contract # 55502											
Relinquished By TELESA CORRESTER	Print	Sign	Date/Time	Received By Julie Gadian	Print	Sign	Date/Time	Matrix*			
Relinquished By WRPS	Print	Sign	Date/Time	Received By Julie Gadian	Print	Sign	Date/Time	Matrix*			
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*			
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*			
Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Disposition All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.											

A-6003-962 (03/05)

C.3.6 Mercury

20163050 Rev. 0

FINAL REPORT ON MERCURY VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED OCTOBER 1 – 2, 2016

Document No.: 20163050 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
November 2, 2016



LAB #184777

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509-376-0737

Prepared by:



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 November 2, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON MERCURY VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 - 2, 2016**

This final report presents the results of forty mercury vapor tubes received at the 222-S Laboratory on October 3, 2016, in good condition and with adequate paperwork. The mercury vapor tubes were logged into sample delivery group 20163050.

DISCLAIMERS

- The information contained in this report is intended only for the use of the addressee and should be considered confidential.
- This report shall not be reproduced, except in full, without written approval of the laboratory.
- The results shown in this report pertain only to the actual samples tested.
- These results conform to the requirements specified in the referenced methods/procedures and specifications provided verbally or electronically by the customer. Any deviations or modifications are discussed in the following narrative.
- This report only addresses laboratory activities related to the listed surveys. Requirements or anomalies concerning field sampling are not addressed in this report.

PROCEDURES

Method	Preparation Procedure	Analysis Procedure
Mercury by OSHA ID-140	LA-325-109, Rev. 2-4	LA-325-109, Rev. 2-4

ANALYTICAL SUMMARY

The vapor tubes were tested for mercury, as specified on the chain of custody. Standard laboratory procedures for digestions and cold vapor atomic absorption for mercury were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory* (QAPP). Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control standards (LCS). For mercury, the results of 178 LCS determinations indicate a mean recovery of 98% with a standard deviation of 6%. Statistical process control limits for the LCS are 81 – 115%, with no significant bias. The overall estimate of uncertainty is 12%, with coverage factor (k) = 2.

Background levels of mercury or interfering compounds can be present in the sorbent tube media used for collecting vapor samples. OSHA ID-140 recommends that the laboratory determine the average background for each lot of media and subtract it from the sample results prior to reporting. However, per agreement with the client, this background is being determined by the client using blank media submitted as blind samples to the laboratory. Any blank subtraction from the sample results will be performed by the client. The laboratory is using the same media

for QC samples. These QC samples may not match the lot numbers of the samples being submitted and the background for this QC sample media has not been determined. Over the past several years the results from preparation blanks, field blanks, and the vast majority of samples have been below the laboratory's method detection limit, which is an order of magnitude below the reporting limit. In general, the laboratory believes there is no need for background subtraction using the current sample media (Hydrar, SKC 226-17-1A).

For the mercury analysis, the blank results for tube lot numbers 8679, 9473, and 7043 were below the detection limit; therefore, no blank correction was required. Fifteen of the forty mercury results for sample group 20163050 were above the reporting limit of 0.05 µg per sample. For these samples, the total result includes the contribution from the back glass wool portion even though the back glass wool portion result is lower than the reporting limit (see Attachment 1).

20163050 Rev. 0

Attachment 1

DATA SUMMARY REPORT

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DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-6-BASE-EFF	Total	SI6T035111	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BASE-EFF	Resin	SI6T035112	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BASE-EFF	Glass Wool	SI6T035113	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BASE-IN	Total	SI6T035114	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BASE-IN	Resin	SI6T035115	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BASE-IN	Glass Wool	SI6T035116	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Total	SI6T035117	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Resin	SI6T035118	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK1	Glass Wool	SI6T035119	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Total	SI6T035120	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Resin	SI6T035121	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-BLANK2	Glass Wool	SI6T035122	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-A	Total	SI6T035143	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-A	Resin	SI6T035144	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-A	Glass Wool	SI6T035145	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-B	Total	SI6T035146	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-B	Resin	SI6T035147	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-B	Glass Wool	SI6T035148	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-C	Total	SI6T035149	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-C	Resin	SI6T035150	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-C	Glass Wool	SI6T035151	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-D	Total	SI6T035152	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-D	Resin	SI6T035153	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-D	Glass Wool	SI6T035154	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-E	Total	SI6T035155	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-E	Resin	SI6T035156	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-E	Glass Wool	SI6T035157	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-F	Total	SI6T035158	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-F	Resin	SI6T035161	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-F	Glass Wool	SI6T035162	Mercury	µg/sample	87.2	<0.0500	<0.0500	0.0500
16-08765-6-EFF-G	Total	SI6T035163	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-G	Resin	SI6T035164	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-EFF-G	Glass Wool	SI6T035165	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-EFF-H	Total	SI6T035166	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-EFF-H	Resin	SI6T035167	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-EFF-H	Glass Wool	SI6T035168	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-A	Total	SI6T035169	Mercury	µg/sample	n/a	<0.0500	0.0775	0.0500
16-08765-6-IN-A	Resin	SI6T035170	Mercury	µg/sample	91.9	<0.0500	0.0725	0.0500
16-08765-6-IN-A	Glass Wool	SI6T035171	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-B	Total	SI6T035172	Mercury	µg/sample	n/a	<0.0500	0.0710	0.0500
16-08765-6-IN-B	Resin	SI6T035173	Mercury	µg/sample	91.9	<0.0500	0.0660	0.0500
16-08765-6-IN-B	Glass Wool	SI6T035174	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-C	Total	SI6T035175	Mercury	µg/sample	n/a	<0.0500	0.0734	0.0500
16-08765-6-IN-C	Resin	SI6T035176	Mercury	µg/sample	91.9	<0.0500	0.0684	0.0500
16-08765-6-IN-C	Glass Wool	SI6T035177	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-D	Total	SI6T035178	Mercury	µg/sample	n/a	<0.0500	0.0802	0.0500
16-08765-6-IN-D	Resin	SI6T035179	Mercury	µg/sample	91.9	<0.0500	0.0752	0.0500
16-08765-6-IN-D	Glass Wool	SI6T035180	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-6-IN-E	Total	S16T035181	Mercury	µg/sample	n/a	<0.0500	0.0722	0.0500
16-08765-6-IN-E	Resin	S16T035182	Mercury	µg/sample	91.9	<0.0500	0.0672	0.0500
16-08765-6-IN-E	Glass Wool	S16T035183	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-F	Total	S16T035184	Mercury	µg/sample	n/a	<0.0500	0.0776	0.0500
16-08765-6-IN-F	Resin	S16T035185	Mercury	µg/sample	91.9	<0.0500	0.0726	0.0500
16-08765-6-IN-F	Glass Wool	S16T035186	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Total	S16T035187	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Resin	S16T035188	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-G	Glass Wool	S16T035189	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08765-6-IN-H	Total	S16T035190	Mercury	µg/sample	n/a	<0.0500	0.0863	0.0500
16-08765-6-IN-H	Resin	S16T035191	Mercury	µg/sample	91.9	<0.0500	0.0813	0.0500
16-08765-6-IN-H	Glass Wool	S16T035192	Mercury	µg/sample	91.9	<0.0500	<0.0500	0.0500
16-08766-6-BASE-EFF	Total	S16T035273	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BASE-EFF	Resin	S16T035354	Mercury	µg/sample	93.8	<0.0500	<0.0500	0.0500
16-08766-6-BASE-EFF	Glass Wool	S16T035355	Mercury	µg/sample	93.8	<0.0500	<0.0500	0.0500
16-08766-6-BASE-IN	Total	S16T035356	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BASE-IN	Resin	S16T035357	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BASE-IN	Glass Wool	S16T035358	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EEF	Total	S16T035399	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EEF	Resin	S16T035400	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-EEF	Glass Wool	S16T035401	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Total	S16T035402	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Resin	S16T035403	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-BLANK-IN	Glass Wool	S16T035404	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-A	Total	S16T035405	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-A	Resin	S16T035406	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-A	Glass Wool	S16T035407	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-B	Total	S16T035408	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-B	Resin	S16T035409	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-B	Glass Wool	S16T035410	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-C	Total	S16T035411	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-C	Resin	S16T035412	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-C	Glass Wool	S16T035413	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-D	Total	S16T035504	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-D	Resin	S16T035505	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-D	Glass Wool	S16T035506	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-E	Total	S16T035517	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-E	Resin	S16T035528	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-E	Glass Wool	S16T035529	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-F	Total	S16T035540	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-F	Resin	S16T035541	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-F	Glass Wool	S16T035542	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-G	Total	S16T035553	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-G	Resin	S16T035554	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-G	Glass Wool	S16T035555	Mercury	µg/sample	93.6	<0.0500	<0.0500	0.0500
16-08766-6-EFF-H	Total	S16T035727	Mercury	µg/sample	n/a	<0.0500	<0.0500	0.0500
16-08766-6-EFF-H	Resin	S16T035728	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-EFF-H	Glass Wool	S16T035729	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163050

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08766-6-IN-A	Total	S16T035730	Mercury	µg/sample	n/a	<0.0500	0.0805	0.0500
16-08766-6-IN-A	Resin	S16T035731	Mercury	µg/sample	88.1	<0.0500	0.0755	0.0500
16-08766-6-IN-A	Glass Wool	S16T035732	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-B	Total	S16T035735	Mercury	µg/sample	n/a	<0.0500	0.0820	0.0500
16-08766-6-IN-B	Resin	S16T035736	Mercury	µg/sample	88.1	<0.0500	0.0770	0.0500
16-08766-6-IN-B	Glass Wool	S16T035737	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-C	Total	S16T035738	Mercury	µg/sample	n/a	<0.0500	0.0776	0.0500
16-08766-6-IN-C	Resin	S16T035739	Mercury	µg/sample	88.1	<0.0500	0.0726	0.0500
16-08766-6-IN-C	Glass Wool	S16T035740	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-D	Total	S16T035741	Mercury	µg/sample	n/a	<0.0500	0.0780	0.0500
16-08766-6-IN-D	Resin	S16T035742	Mercury	µg/sample	88.1	<0.0500	0.0730	0.0500
16-08766-6-IN-D	Glass Wool	S16T035743	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-E	Total	S16T035744	Mercury	µg/sample	n/a	<0.0500	0.0793	0.0500
16-08766-6-IN-E	Resin	S16T035745	Mercury	µg/sample	88.1	<0.0500	0.0743	0.0500
16-08766-6-IN-E	Glass Wool	S16T035746	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-F	Total	S16T035747	Mercury	µg/sample	n/a	<0.0500	0.0804	0.0500
16-08766-6-IN-F	Resin	S16T035748	Mercury	µg/sample	88.1	<0.0500	0.0754	0.0500
16-08766-6-IN-F	Glass Wool	S16T035749	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-G	Total	S16T035750	Mercury	µg/sample	n/a	<0.0500	0.0848	0.0500
16-08766-6-IN-G	Resin	S16T035751	Mercury	µg/sample	88.1	<0.0500	0.0798	0.0500
16-08766-6-IN-G	Glass Wool	S16T035752	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500
16-08766-6-IN-H	Total	S16T035754	Mercury	µg/sample	n/a	<0.0500	0.0865	0.0500
16-08766-6-IN-H	Resin	S16T035757	Mercury	µg/sample	88.1	<0.0500	0.0815	0.0500
16-08766-6-IN-H	Glass Wool	S16T035758	Mercury	µg/sample	88.1	<0.0500	<0.0500	0.0500

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Attachment 2

ANALYSIS DATE REPORT

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ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163050

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035112	16-08765-6-BASE-EFF	Mercury	10/04/2016 14:00	10/04/2016 16:38
S16T035113	16-08765-6-BASE-EFF	Mercury	10/04/2016 14:00	10/04/2016 16:40
S16T035115	16-08765-6-BASE-IN	Mercury	10/04/2016 14:00	10/04/2016 16:41
S16T035116	16-08765-6-BASE-IN	Mercury	10/04/2016 14:00	10/04/2016 16:43
S16T035118	16-08765-6-BLANK1	Mercury	10/04/2016 14:00	10/04/2016 16:44
S16T035119	16-08765-6-BLANK1	Mercury	10/04/2016 14:00	10/04/2016 16:46
S16T035121	16-08765-6-BLANK2	Mercury	10/04/2016 14:00	10/04/2016 16:51
S16T035122	16-08765-6-BLANK2	Mercury	10/04/2016 14:00	10/04/2016 16:53
S16T035144	16-08765-6-EFF-A	Mercury	10/04/2016 14:00	10/04/2016 16:55
S16T035145	16-08765-6-EFF-A	Mercury	10/04/2016 14:00	10/04/2016 16:57
S16T035147	16-08765-6-EFF-B	Mercury	10/04/2016 14:00	10/04/2016 16:58
S16T035148	16-08765-6-EFF-B	Mercury	10/04/2016 14:00	10/04/2016 17:00
S16T035150	16-08765-6-EFF-C	Mercury	10/04/2016 14:00	10/04/2016 17:02
S16T035151	16-08765-6-EFF-C	Mercury	10/04/2016 14:00	10/04/2016 17:03
S16T035153	16-08765-6-EFF-D	Mercury	10/04/2016 14:00	10/04/2016 17:05
S16T035154	16-08765-6-EFF-D	Mercury	10/04/2016 14:00	10/04/2016 17:06
S16T035156	16-08765-6-EFF-E	Mercury	10/04/2016 14:00	10/04/2016 17:11
S16T035157	16-08765-6-EFF-E	Mercury	10/04/2016 14:00	10/04/2016 17:13
S16T035161	16-08765-6-EFF-F	Mercury	10/04/2016 14:00	10/04/2016 17:14
S16T035162	16-08765-6-EFF-F	Mercury	10/04/2016 14:00	10/04/2016 17:16
S16T035164	16-08765-6-EFF-G	Mercury	10/04/2016 14:00	10/04/2016 17:23
S16T035165	16-08765-6-EFF-G	Mercury	10/04/2016 14:00	10/04/2016 17:25
S16T035167	16-08765-6-EFF-H	Mercury	10/04/2016 14:00	10/04/2016 17:30
S16T035168	16-08765-6-EFF-H	Mercury	10/04/2016 14:00	10/04/2016 17:31
S16T035170	16-08765-6-IN-A	Mercury	10/04/2016 14:00	10/04/2016 17:33
S16T035171	16-08765-6-IN-A	Mercury	10/04/2016 14:00	10/04/2016 17:35
S16T035173	16-08765-6-IN-B	Mercury	10/04/2016 14:00	10/04/2016 17:36
S16T035174	16-08765-6-IN-B	Mercury	10/04/2016 14:00	10/04/2016 17:38
S16T035176	16-08765-6-IN-C	Mercury	10/04/2016 14:00	10/04/2016 17:40
S16T035177	16-08765-6-IN-C	Mercury	10/04/2016 14:00	10/04/2016 17:42
S16T035179	16-08765-6-IN-D	Mercury	10/04/2016 14:00	10/04/2016 17:43
S16T035180	16-08765-6-IN-D	Mercury	10/04/2016 14:00	10/04/2016 17:45
S16T035182	16-08765-6-IN-E	Mercury	10/04/2016 14:00	10/04/2016 17:50
S16T035183	16-08765-6-IN-E	Mercury	10/04/2016 14:00	10/04/2016 17:52
S16T035185	16-08765-6-IN-F	Mercury	10/04/2016 14:00	10/04/2016 17:53
S16T035186	16-08765-6-IN-F	Mercury	10/04/2016 14:00	10/04/2016 17:55
S16T035188	16-08765-6-IN-G	Mercury	10/04/2016 14:00	10/04/2016 17:57
S16T035189	16-08765-6-IN-G	Mercury	10/04/2016 14:00	10/04/2016 17:59
S16T035191	16-08765-6-IN-H	Mercury	10/04/2016 14:00	10/04/2016 18:00
S16T035192	16-08765-6-IN-H	Mercury	10/04/2016 14:00	10/04/2016 18:02
S16T035354	16-08766-6-BASE-EFF	Mercury	10/06/2016 16:00	10/06/2016 19:59
S16T035355	16-08766-6-BASE-EFF	Mercury	10/06/2016 16:00	10/06/2016 20:01
S16T035357	16-08766-6-BASE-IN	Mercury	10/06/2016 16:00	10/06/2016 20:08
S16T035358	16-08766-6-BASE-IN	Mercury	10/06/2016 16:00	10/06/2016 20:10
S16T035400	16-08766-6-BLANK-EEF	Mercury	10/06/2016 16:00	10/06/2016 20:15
S16T035401	16-08766-6-BLANK-EEF	Mercury	10/06/2016 16:00	10/06/2016 20:17

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163050

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035403	16-08766-6-BLANK-IN	Mercury	10/06/2016 16:00	10/06/2016 20:18
S16T035404	16-08766-6-BLANK-IN	Mercury	10/06/2016 16:00	10/06/2016 20:20
S16T035406	16-08766-6-EFF-A	Mercury	10/06/2016 16:00	10/06/2016 20:22
S16T035407	16-08766-6-EFF-A	Mercury	10/06/2016 16:00	10/06/2016 20:23
S16T035409	16-08766-6-EFF-B	Mercury	10/06/2016 16:00	10/06/2016 20:25
S16T035410	16-08766-6-EFF-B	Mercury	10/06/2016 16:00	10/06/2016 20:26
S16T035412	16-08766-6-EFF-C	Mercury	10/06/2016 16:00	10/06/2016 20:28
S16T035413	16-08766-6-EFF-C	Mercury	10/06/2016 16:00	10/06/2016 20:30
S16T035505	16-08766-6-EFF-D	Mercury	10/06/2016 16:00	10/06/2016 20:35
S16T035506	16-08766-6-EFF-D	Mercury	10/06/2016 16:00	10/06/2016 20:37
S16T035528	16-08766-6-EFF-E	Mercury	10/06/2016 16:00	10/06/2016 20:38
S16T035529	16-08766-6-EFF-E	Mercury	10/06/2016 16:00	10/06/2016 20:40
S16T035541	16-08766-6-EFF-F	Mercury	10/06/2016 16:00	10/06/2016 20:42
S16T035542	16-08766-6-EFF-F	Mercury	10/06/2016 16:00	10/06/2016 20:44
S16T035554	16-08766-6-EFF-G	Mercury	10/06/2016 16:00	10/06/2016 20:45
S16T035555	16-08766-6-EFF-G	Mercury	10/06/2016 16:00	10/06/2016 20:47
S16T035728	16-08766-6-EFF-H	Mercury	10/10/2016 08:00	10/10/2016 10:37
S16T035729	16-08766-6-EFF-H	Mercury	10/10/2016 08:00	10/10/2016 10:38
S16T035731	16-08766-6-IN-A	Mercury	10/10/2016 08:00	10/10/2016 10:40
S16T035732	16-08766-6-IN-A	Mercury	10/10/2016 08:00	10/10/2016 10:41
S16T035736	16-08766-6-IN-B	Mercury	10/10/2016 08:00	10/10/2016 10:43
S16T035737	16-08766-6-IN-B	Mercury	10/10/2016 08:00	10/10/2016 10:45
S16T035739	16-08766-6-IN-C	Mercury	10/10/2016 08:00	10/10/2016 10:50
S16T035740	16-08766-6-IN-C	Mercury	10/10/2016 08:00	10/10/2016 10:52
S16T035742	16-08766-6-IN-D	Mercury	10/10/2016 08:00	10/10/2016 10:53
S16T035743	16-08766-6-IN-D	Mercury	10/10/2016 08:00	10/10/2016 10:55
S16T035745	16-08766-6-IN-E	Mercury	10/10/2016 08:00	10/10/2016 10:57
S16T035746	16-08766-6-IN-E	Mercury	10/10/2016 08:00	10/10/2016 10:58
S16T035748	16-08766-6-IN-F	Mercury	10/10/2016 08:00	10/10/2016 11:00
S16T035749	16-08766-6-IN-F	Mercury	10/10/2016 08:00	10/10/2016 11:02
S16T035751	16-08766-6-IN-G	Mercury	10/10/2016 08:00	10/10/2016 11:03
S16T035752	16-08766-6-IN-G	Mercury	10/10/2016 08:00	10/10/2016 11:05
S16T035757	16-08766-6-IN-H	Mercury	10/10/2016 08:00	10/10/2016 11:10
S16T035758	16-08766-6-IN-H	Mercury	10/10/2016 08:00	10/10/2016 11:12

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Attachment 3

RECEIPT PAPERWORK

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222-S		SAMPLE RECEIPT AND CHAIN OF CUSTODY VERIFICATION CHECKLIST			ATS-LO-090-101 Rev DG-1	
Date Samples Received: <u>10-3-16</u> Total Number of Samples: <u>480</u> Group #: <u>20163050-Hg</u>						
Sample Custodian: <u>Diane Turner</u> IH Technician: <u>Bob Dunn</u> <u>10-3-16</u>						
Sample Custodian to Complete:						
Action	Yes	No	N/A	Comments		
RSR provided?			<input checked="" type="checkbox"/>			
Verify GKI is complete			<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File		
Received from an alpha facility?		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release		
Check that outer custody seal is intact, if present			<input checked="" type="checkbox"/>			
Record cooler temperature in centigrade, as appropriate	<u>3°C</u>			<input type="checkbox"/> Check if no cooler and/or no ice		
Samples are intact and in good condition	<input checked="" type="checkbox"/>			If No, provide comments below		
RSA/COC provided and complete containing the following information?						
• Client name and client sample number	<input checked="" type="checkbox"/>					
• Date and time of sampling	<input checked="" type="checkbox"/>					
• Sampling location or origin	<input checked="" type="checkbox"/>					
• Container type, size, and number	<input checked="" type="checkbox"/>					
• Preservatives (if used) noted on the COC/RSA and sample bottles			<input checked="" type="checkbox"/>			
• Analysis request is clear	<input checked="" type="checkbox"/>					
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>					
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>					
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>					
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>					
Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.						
Samples acceptable for release? <u>yes</u> PC/SC Initials <u>dlr</u> Date <u>10-3-16</u>						
If No, comment on communication and resolution:						
<p style="text-align: center;">WRPS SHIP 280 RUN 120 WHL RUN 80 (40NH₃, 40Hg) Acetonitrile 40</p>						
Number of IH Samples Received:						
Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____		
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe: _____	1,3-Butadiene: <u>80</u>		
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>		
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVOA: <u>40</u>	VOA: <u>40</u>	Other-IH: _____		

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/30/16	
CACN: 202367	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A, Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
5167035111	16-08765-6-BASE-EFF / Hydrar (SKC 226-17-1A) * 5167035112 5167035113	Hg-Elemental Source 1
5167035114	16-08765-6-BASE-IN / Hydrar (SKC 226-17-1A) * 5167035115 5167035116	Hg-Elemental Source 2
5167035117	16-08765-6-BLANK1 / Hydrar (SKC 226-17-1A) * 5167035118 5167035119	Hg-Elemental Source 3
5167035120	16-08765-6-BLANK2 / Hydrar (SKC 226-17-1A) * 5167035121 5167035122	Hg-Elemental Source 4
5167035143	16-08765-6-EFF-A / Hydrar (SKC 226-17-1A) * 5167035144 5167035145	Hg-Elemental Source 5
5167035146	16-08765-6-EFF-B / Hydrar (SKC 226-17-1A) * 5167035147 5167035148	Hg-Elemental Source 6
5167035149	16-08765-6-EFF-C / Hydrar (SKC 226-17-1A) * 5167035150 5167035151	Hg-Elemental Source 7
5167035152	16-08765-6-EFF-D / Hydrar (SKC 226-17-1A) * 5167035153 5167035154	Hg-Elemental Source 8

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:		Valerie Hendricks	2704HV/rm H104	10/31/16	0425
Retrieved from Storage:		BRETT GARNER		10-3-16	0730

	Signature	Printed Name	Date	Time
Relinquished By:		BRETT GARNER	10-3-16	1040
Received By:		Dianne Turner	10-3-16	1040
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/30/16 + B6 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
516T035155	16-08765-6-EFF-E / Hydrar (SKC 226-17-1A) * 516T035156 516T035157	Hg-Elemental Source 9	
516T035158	16-08765-6-EFF-F / Hydrar (SKC 226-17-1A) * 516T035161 516T035162	Hg-Elemental Source 10	
516T035163	16-08765-6-EFF-G / Hydrar (SKC 226-17-1A) * 516T035164 516T035165	Hg-Elemental Source 11	
516T035166	16-08765-6-EFF-H / Hydrar (SKC 226-17-1A) * 516T035167 516T035168	Hg-Elemental Source 12	
516T035169	16-08765-6-IN-A / Hydrar (SKC 226-17-1A) * 516T035170 516T035171	Hg-Elemental Source 13	
516T035172	16-08765-6-IN-B / Hydrar (SKC 226-17-1A) * 516T035173 516T035174	Hg-Elemental Source 14	
516T035175	16-08765-6-IN-C / Hydrar (SKC 226-17-1A) * 516T035176 516T035177	Hg-Elemental Source 15	
516T035178	16-08765-6-IN-D / Hydrar (SKC 226-17-1A) * 516T035179 516T035180	Hg-Elemental Source 16	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704 HU rm 1104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	Dianne Turner	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/11/16	
CACN: 202367	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L.	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A.	MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
5167035181	16-08765-6-IN-E / Hydrar (SKC 226-17-1A)* 5167035182 5167035183	Hg-Elemental Source 17	
5167035184	16-08765-6-IN-F / Hydrar (SKC 226-17-1A)* 5167035185 5167035186	Hg-Elemental Source 18	
5167035187	16-08765-6-IN-G / Hydrar (SKC 226-17-1A)* 5167035188 5167035189	Hg-Elemental Source 19	
5167035190	16-08765-6-IN-H / Hydrar (SKC 226-17-1A)* 5167035191 5167035192	Hg-Elemental Source 20	
	16-08765-7-BASE-EFF / CISA (SKC 226-29)	NH3 Source	
	16-08765-7-BASE-IN / CISA (SKC 226-29)	NH3 Source	
	16-08765-7-BLANK1 / CISA (SKC 226-29)	NH3 Source	
	16-08765-7-BLANK2 / CISA (SKC 226-29)	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2104 HV rm H104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-7-16
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	Dianne Turner	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737

Laboratory Log No.	Sample ID/Type/Description	Required Analysis
516T035273	16-08766-6-BASE-EFF / Hydrar (SKC 226-17-1A) 516T035354 516T035355	Hg-Elemental Source 21
516T035356	16-08766-6-BASE-IN / Hydrar (SKC 226-17-1A) 516T035357 516T035358	Hg-Elemental Source 22
516T035399	16-08766-6-BLANK-EFF / Hydrar (SKC 226-17-1A) 516T035400 516T035401	Hg-Elemental Source 23
516T035402	16-08766-6-BLANK-IN / Hydrar (SKC 226-17-1A) 516T035403 516T035404	Hg-Elemental Source 24
516T035405	16-08766-6-EFF-A / Hydrar (SKC 226-17-1A) 516T035406 516T035407	Hg-Elemental Source 25
516T035408	16-08766-6-EFF-B / Hydrar (SKC 226-17-1A) 516T035409 516T035410	Hg-Elemental Source 26
516T035411	16-08766-6-EFF-C / Hydrar (SKC 226-17-1A) 516T035412 516T035413	Hg-Elemental Source 27
516T035504	16-08766-6-EFF-D / Hydrar (SKC 226-17-1A) 516T035505 516T035506	Hg-Elemental Source 28

Special Instructions:

	Signature	Printed Name	Location	Date	Time
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704 HV rm H104	10/2/16	0543
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER		10-3-16	0739

	Signature	Printed Name	Date	Time
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16	1040
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16	1040
Relinquished By:				
Received By:				
Relinquished By:				
Received By:				

Additional Comments:

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
5167035517	16-08766-6-EFF-E / Hydrar (SKC 226-17-1A) 5167035528 5167035529	Hg-Elemental Source 29	
5167035540	16-08766-6-EFF-F / Hydrar (SKC 226-17-1A) 5167035541 5167035542	Hg-Elemental Source 30	
5167035553	16-08766-6-EFF-G / Hydrar (SKC 226-17-1A) 5167035554 5167035555	Hg-Elemental Source 31	
5167035727	16-08766-6-EFF-H / Hydrar (SKC 226-17-1A) 5167035728 5167035729	Hg-Elemental Source 32	
5167035730	16-08766-6-IN-A / Hydrar (SKC 226-17-1A) 5167035731 5167035732	Hg-Elemental Source 33	
5167035735	16-08766-6-IN-B / Hydrar (SKC 226-17-1A) 5167035736 5167035737	Hg-Elemental Source 34	
5167035738	16-08766-6-IN-C / Hydrar (SKC 226-17-1A) 5167035739 5167035740	Hg-Elemental Source 35	
5167035741	16-08766-6-IN-D / Hydrar (SKC 226-17-1A) 5167035742 5167035743	Hg-Elemental Source 36	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704HV -mH/104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-3-16 0779
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
5167035744	16-08766-6-IN-E / Hydrar (SKC 226-17-1A) 5167035745 5167035746	Hg-Elemental Source 37	
5167035747	16-08766-6-IN-F / Hydrar (SKC 226-17-1A) 5167035748 5167035749	Hg-Elemental Source 38	
5167035750	16-08766-6-IN-G / Hydrar (SKC 226-17-1A) 5167035751 5167035752	Hg-Elemental Source 39	
5167035754	16-08766-6-IN-H / Hydrar (SKC 226-17-1A) 5167035757 5167035758	Hg-Elemental Source 40	
	16-08766-7-BASE-EFF / CISA (SKC 226-29)	NH3 Source	
	16-08766-7-BASE-IN / CISA (SKC 226-29)	NH3 Source	
	16-08766-7-BLANK-EFF / CISA (SKC 226-29)	NH3 Source	
	16-08766-7-BLANK-IN / CISA (SKC 226-29)	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendrick	2704HV rm H104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-3-16 0739
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

C.3.7 Ammonia

20163048 Rev. 0

FINAL REPORT ON AMMONIA VAPOR TUBES FOR CARTRIDGE EVALUATION COLLECTED OCTOBER 1 – 2, 2016

Document No.: 20163048 Rev. 0

Michael A. Purcell
WAI Hanford Laboratory

Date Published
November 2, 2016



Prepared for:

Prepared by:


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Washington River Protection
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509-373-3240

 November 2, 2016
Michael A. Purcell, WHL Project Coordinator

NARRATIVE

**FINAL REPORT ON AMMONIA VAPOR TUBES
FOR CARTRIDGE EVALUATION
COLLECTED OCTOBER 1 - 2, 2016**

This final report presents the results of forty ammonia vapor tubes received at the 222-S Laboratory on October 3, 2016, in good condition and with adequate paperwork. The samples were logged into sample delivery group 20163048.

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-503-157, Rev. 2-6

ANALYTICAL SUMMARY

The vapor tubes were tested for ammonia, as specified on the chain of custody. Standard laboratory procedures for ion chromatography were followed as well as the requirements in WHL-MP-1029, *WHL Industrial Hygiene Quality Assurance Project Plan for 222-S Laboratory* (QAPP). Program specific work authorization instructions have been provided for WRPS IH sample analysis through verbal and electronic communication with the customer point of contact, and are kept as a record by the laboratory. When applicable, any client communication specific to the samples in this report will be included herein. All quality control criteria in the QAPP were met.

The measurement uncertainty was estimated based on the historical behavior of laboratory control samples (LCS). The results of 373 LCS determinations indicate a mean recovery of 98% with a standard deviation of 3.3%. Statistical process control limits for the LCS are 80 - 120%, with no significant bias. The overall estimate of uncertainty is 6.7%, with coverage factor (k) = 2.

Due to background levels of ammonium (or interfering compounds) that are typically present in the media used in the sorbent tubes for collecting the vapor samples, positive results are obtained for the preparation blank. Laboratories typically correct the LCS and all field samples for these background levels, when detected. However, per agreement with the customer, no blank subtraction was performed. The client-requested reporting limit is 10 µg per sample, which makes the analysis of additional blanks and subsequent blank subtraction unnecessary. It is the

laboratory's opinion that including the media contribution, which is well below the client's requested reporting limit, provides results that are more conservative than when blank subtractions are performed. Twenty-six of the forty ammonia results for sample group 20163048 were above the reporting limit of 10 µg per sample. For these samples, the total result includes the contribution from the back resin portion even though the back resin portion result is lower than the reporting limit (see Attachment 1).

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Attachment 1

DATA SUMMARY REPORT

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DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-7-BASE-EFF	Total	S16T035587	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BASE-EFF	Front Resin	S16T035588	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-EFF	Back Resin	S16T035589	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Total	S16T035590	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Front Resin	S16T035591	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BASE-IN	Back Resin	S16T035592	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK1	Total	S16T035593	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BLANK1	Front Resin	S16T035594	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK1	Back Resin	S16T035595	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK2	Total	S16T035596	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-BLANK2	Front Resin	S16T035598	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-BLANK2	Back Resin	S16T035599	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-A	Total	S16T035604	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-A	Front Resin	S16T035637	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-A	Back Resin	S16T035639	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-B	Total	S16T035642	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-B	Front Resin	S16T035643	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-B	Back Resin	S16T035644	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-C	Total	S16T035645	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-C	Front Resin	S16T035646	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-C	Back Resin	S16T035647	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-D	Total	S16T035648	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08765-7-EFF-D	Front Resin	S16T035649	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-D	Back Resin	S16T035650	Ammonia	ug/sample	102	<10.0	<10.0	10.0
16-08765-7-EFF-E	Total	S16T035651	Ammonia	ug/sample	n/a	<10.0	22.8	10.0
16-08765-7-EFF-E	Front Resin	S16T035652	Ammonia	ug/sample	94.0	<10.0	22.3	10.0
16-08765-7-EFF-E	Back Resin	S16T035653	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-F	Total	S16T035654	Ammonia	ug/sample	n/a	<10.0	62.8	10.0
16-08765-7-EFF-F	Front Resin	S16T035655	Ammonia	ug/sample	94.0	<10.0	62.0	10.0
16-08765-7-EFF-F	Back Resin	S16T035656	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-G	Total	S16T035657	Ammonia	ug/sample	n/a	<10.0	71.4	10.0
16-08765-7-EFF-G	Front Resin	S16T035658	Ammonia	ug/sample	94.0	<10.0	70.7	10.0
16-08765-7-EFF-G	Back Resin	S16T035659	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-EFF-H	Total	S16T035660	Ammonia	ug/sample	n/a	<10.0	123	20.0
16-08765-7-EFF-H	Front Resin	S16T035661	Ammonia	ug/sample	94.0	<10.0	122	20.0
16-08765-7-EFF-H	Back Resin	S16T035662	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-A	Total	S16T035663	Ammonia	ug/sample	n/a	<10.0	468	100
16-08765-7-IN-A	Front Resin	S16T035664	Ammonia	ug/sample	94.0	<10.0	467	100
16-08765-7-IN-A	Back Resin	S16T035665	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-B	Total	S16T035666	Ammonia	ug/sample	n/a	<10.0	428	100
16-08765-7-IN-B	Front Resin	S16T035667	Ammonia	ug/sample	94.0	<10.0	428	10.0
16-08765-7-IN-B	Back Resin	S16T035668	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-C	Total	S16T035669	Ammonia	ug/sample	n/a	<10.0	512	100
16-08765-7-IN-C	Front Resin	S16T035670	Ammonia	ug/sample	94.0	<10.0	511	100
16-08765-7-IN-C	Back Resin	S16T035671	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-D	Total	S16T035672	Ammonia	ug/sample	n/a	<10.0	473	100
16-08765-7-IN-D	Front Resin	S16T035673	Ammonia	ug/sample	94.0	<10.0	473	100
16-08765-7-IN-D	Back Resin	S16T035674	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08765-7-IN-E	Total	S16T035675	Ammonia	ug/sample	n/a	<10.0	400	100
16-08765-7-IN-E	Front Resin	S16T035676	Ammonia	ug/sample	94.0	<10.0	400	100
16-08765-7-IN-E	Back Resin	S16T035677	Ammonia	ug/sample	94.0	<10.0	<10.0	10.0
16-08765-7-IN-F	Total	S16T035678	Ammonia	ug/sample	n/a	<10.0	44.7	10.0
16-08765-7-IN-F	Front Resin	S16T035679	Ammonia	ug/sample	101	<10.0	44.1	10.0
16-08765-7-IN-F	Back Resin	S16T035680	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08765-7-IN-G	Total	S16T035681	Ammonia	ug/sample	n/a	<10.0	46.3	10.0
16-08765-7-IN-G	Front Resin	S16T035682	Ammonia	ug/sample	101	<10.0	45.1	10.0
16-08765-7-IN-G	Back Resin	S16T035683	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08765-7-IN-H	Total	S16T035684	Ammonia	ug/sample	n/a	<10.0	534	100
16-08765-7-IN-H	Front Resin	S16T035685	Ammonia	ug/sample	101	<10.0	533	100
16-08765-7-IN-H	Back Resin	S16T035686	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Total	S16T035687	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Front Resin	S16T035688	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BASE-EFF	Back Resin	S16T035689	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BASE-IN	Total	S16T035690	Ammonia	ug/sample	n/a	<10.0	10.3	10.0
16-08766-7-BASE-IN	Front Resin	S16T035691	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BASE-IN	Back Resin	S16T035692	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Total	S16T035693	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Front Resin	S16T035694	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BLANK-EFF	Back Resin	S16T035695	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Total	S16T035696	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Front Resin	S16T035697	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-BLANK-IN	Back Resin	S16T035698	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-A	Total	S16T035699	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-EFF-A	Front Resin	S16T035700	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-A	Back Resin	S16T035701	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-B	Total	S16T035702	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-EFF-B	Front Resin	S16T035703	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-B	Back Resin	S16T035704	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-C	Total	S16T035705	Ammonia	ug/sample	n/a	<10.0	<10.0	10.0
16-08766-7-EFF-C	Front Resin	S16T035706	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-C	Back Resin	S16T035707	Ammonia	ug/sample	101	<10.0	<10.0	10.0
16-08766-7-EFF-D	Total	S16T035708	Ammonia	ug/sample	n/a	<10.0	15.1	10.0
16-08766-7-EFF-D	Front Resin	S16T035709	Ammonia	ug/sample	100	<10.0	14.3	10.0
16-08766-7-EFF-D	Back Resin	S16T035710	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-EFF-E	Total	S16T035711	Ammonia	ug/sample	n/a	<10.0	25.5	10.0
16-08766-7-EFF-E	Front Resin	S16T035712	Ammonia	ug/sample	100	<10.0	24.7	10.0
16-08766-7-EFF-E	Back Resin	S16T035713	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-EFF-F	Total	S16T035714	Ammonia	ug/sample	n/a	<10.0	49.1	10.0
16-08766-7-EFF-F	Front Resin	S16T035715	Ammonia	ug/sample	100	<10.0	48.2	10.0
16-08766-7-EFF-F	Back Resin	S16T035716	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-EFF-G	Total	S16T035717	Ammonia	ug/sample	n/a	<10.0	84.3	10.0
16-08766-7-EFF-G	Front Resin	S16T035718	Ammonia	ug/sample	100	<10.0	83.2	10.0
16-08766-7-EFF-G	Back Resin	S16T035719	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-EFF-H	Total	S16T035720	Ammonia	ug/sample	n/a	<10.0	148	50.0
16-08766-7-EFF-H	Front Resin	S16T035721	Ammonia	ug/sample	100	<10.0	147	50.0
16-08766-7-EFF-H	Back Resin	S16T035722	Ammonia	ug/sample	100	<10.0	<10.0	10.0

DATA SUMMARY REPORT FOR SAMPLE GROUP 20163048

Customer Sample ID	Vapor Tube Portion	Laboratory Sample ID	Analyte	Result Unit	Standard % Recovery	Blank	Result	Reporting Limit
16-08766-7-IN-A	Total	S16T035723	Ammonia	ug/sample	n/a	<10.0	473	100
16-08766-7-IN-A	Front Resin	S16T035724	Ammonia	ug/sample	100	<10.0	472	100
16-08766-7-IN-A	Back Resin	S16T035725	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-B	Total	S16T035726	Ammonia	ug/sample	n/a	<10.0	513	100
16-08766-7-IN-B	Front Resin	S16T035733	Ammonia	ug/sample	100	<10.0	512	100
16-08766-7-IN-B	Back Resin	S16T035734	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-C	Total	S16T035753	Ammonia	ug/sample	n/a	<10.0	492	100
16-08766-7-IN-C	Front Resin	S16T035755	Ammonia	ug/sample	100	<10.0	491	100
16-08766-7-IN-C	Back Resin	S16T035756	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-D	Total	S16T035759	Ammonia	ug/sample	n/a	<10.0	519	100
16-08766-7-IN-D	Front Resin	S16T035760	Ammonia	ug/sample	100	<10.0	518	100
16-08766-7-IN-D	Back Resin	S16T035761	Ammonia	ug/sample	100	<10.0	<10.0	10.0
16-08766-7-IN-E	Total	S16T035762	Ammonia	ug/sample	n/a	<10.0	472	100
16-08766-7-IN-E	Front Resin	S16T035763	Ammonia	ug/sample	97.4	<10.0	471	100
16-08766-7-IN-E	Back Resin	S16T035764	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-F	Total	S16T035765	Ammonia	ug/sample	n/a	<10.0	328	100
16-08766-7-IN-F	Front Resin	S16T035766	Ammonia	ug/sample	97.4	<10.0	327	100
16-08766-7-IN-F	Back Resin	S16T035767	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-G	Total	S16T035768	Ammonia	ug/sample	n/a	<10.0	473	100
16-08766-7-IN-G	Front Resin	S16T035769	Ammonia	ug/sample	97.4	<10.0	472	100
16-08766-7-IN-G	Back Resin	S16T035770	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0
16-08766-7-IN-H	Total	S16T035771	Ammonia	ug/sample	n/a	<10.0	521	100
16-08766-7-IN-H	Front Resin	S16T035772	Ammonia	ug/sample	97.4	<10.0	520	100
16-08766-7-IN-H	Back Resin	S16T035773	Ammonia	ug/sample	97.4	<10.0	<10.0	10.0

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Attachment 2

ANALYSIS DATE REPORT

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ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163048

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035588	16-08765-7-BASE-EFF	Ammonia	10/06/2016 17:00	10/07/2016 00:37
S16T035589	16-08765-7-BASE-EFF	Ammonia	10/06/2016 17:00	10/07/2016 01:00
S16T035591	16-08765-7-BASE-IN	Ammonia	10/06/2016 17:00	10/07/2016 02:33
S16T035592	16-08765-7-BASE-IN	Ammonia	10/06/2016 17:00	10/07/2016 02:56
S16T035594	16-08765-7-BLANK1	Ammonia	10/06/2016 17:00	10/07/2016 03:19
S16T035595	16-08765-7-BLANK1	Ammonia	10/06/2016 17:00	10/07/2016 03:42
S16T035598	16-08765-7-BLANK2	Ammonia	10/06/2016 17:00	10/07/2016 04:05
S16T035599	16-08765-7-BLANK2	Ammonia	10/06/2016 17:00	10/07/2016 04:29
S16T035637	16-08765-7-EFF-A	Ammonia	10/06/2016 17:00	10/07/2016 04:52
S16T035639	16-08765-7-EFF-A	Ammonia	10/06/2016 17:00	10/07/2016 05:15
S16T035643	16-08765-7-EFF-B	Ammonia	10/06/2016 17:00	10/07/2016 05:38
S16T035644	16-08765-7-EFF-B	Ammonia	10/06/2016 17:00	10/07/2016 06:01
S16T035646	16-08765-7-EFF-C	Ammonia	10/06/2016 17:00	10/07/2016 07:34
S16T035647	16-08765-7-EFF-C	Ammonia	10/06/2016 17:00	10/07/2016 07:57
S16T035649	16-08765-7-EFF-D	Ammonia	10/06/2016 17:00	10/07/2016 08:20
S16T035650	16-08765-7-EFF-D	Ammonia	10/06/2016 17:00	10/07/2016 08:43
S16T035652	16-08765-7-EFF-E	Ammonia	10/06/2016 17:00	10/07/2016 11:48
S16T035653	16-08765-7-EFF-E	Ammonia	10/06/2016 17:00	10/07/2016 12:12
S16T035655	16-08765-7-EFF-F	Ammonia	10/06/2016 17:00	10/07/2016 12:35
S16T035656	16-08765-7-EFF-F	Ammonia	10/06/2016 17:00	10/07/2016 12:58
S16T035658	16-08765-7-EFF-G	Ammonia	10/06/2016 17:00	10/07/2016 13:21
S16T035659	16-08765-7-EFF-G	Ammonia	10/06/2016 17:00	10/07/2016 13:44
S16T035661	16-08765-7-EFF-H	Ammonia	10/06/2016 17:00	10/10/2016 12:20
S16T035662	16-08765-7-EFF-H	Ammonia	10/06/2016 17:00	10/07/2016 15:40
S16T035664	16-08765-7-IN-A	Ammonia	10/06/2016 17:00	10/10/2016 12:43
S16T035665	16-08765-7-IN-A	Ammonia	10/06/2016 17:00	10/07/2016 16:26
S16T035667	16-08765-7-IN-B	Ammonia	10/06/2016 17:00	10/10/2016 13:06
S16T035668	16-08765-7-IN-B	Ammonia	10/06/2016 17:00	10/07/2016 17:12
S16T035670	16-08765-7-IN-C	Ammonia	10/06/2016 17:00	10/10/2016 13:29
S16T035671	16-08765-7-IN-C	Ammonia	10/06/2016 17:00	10/07/2016 17:59
S16T035673	16-08765-7-IN-D	Ammonia	10/06/2016 17:00	10/10/2016 13:52
S16T035674	16-08765-7-IN-D	Ammonia	10/06/2016 17:00	10/07/2016 18:45
S16T035676	16-08765-7-IN-E	Ammonia	10/06/2016 17:00	10/10/2016 14:15
S16T035677	16-08765-7-IN-E	Ammonia	10/06/2016 17:00	10/07/2016 20:41
S16T035679	16-08765-7-IN-F	Ammonia	10/14/2016 09:00	10/14/2016 17:59
S16T035680	16-08765-7-IN-F	Ammonia	10/14/2016 09:00	10/14/2016 18:22
S16T035682	16-08765-7-IN-G	Ammonia	10/14/2016 09:00	10/14/2016 18:45
S16T035683	16-08765-7-IN-G	Ammonia	10/14/2016 09:00	10/14/2016 19:08
S16T035685	16-08765-7-IN-H	Ammonia	10/14/2016 09:00	10/17/2016 13:57
S16T035686	16-08765-7-IN-H	Ammonia	10/14/2016 09:00	10/14/2016 19:55
S16T035688	16-08766-7-BASE-EFF	Ammonia	10/14/2016 09:00	10/14/2016 21:27
S16T035689	16-08766-7-BASE-EFF	Ammonia	10/14/2016 09:00	10/14/2016 21:50
S16T035691	16-08766-7-BASE-IN	Ammonia	10/14/2016 09:00	10/14/2016 22:14
S16T035692	16-08766-7-BASE-IN	Ammonia	10/14/2016 09:00	10/14/2016 22:37
S16T035694	16-08766-7-BLANK-EFF	Ammonia	10/14/2016 09:00	10/14/2016 23:00
S16T035695	16-08766-7-BLANK-EFF	Ammonia	10/14/2016 09:00	10/14/2016 23:23

ANALYSIS DATE REPORT FOR SAMPLE GROUP 20163048

Laboratory Sample ID	Customer Sample ID	Method	Preparation Date	Analysis Date
S16T035697	16-08766-7-BLANK-IN	Ammonia	10/14/2016 09:00	10/14/2016 23:46
S16T035698	16-08766-7-BLANK-IN	Ammonia	10/14/2016 09:00	10/15/2016 00:09
S16T035700	16-08766-7-EFF-A	Ammonia	10/14/2016 09:00	10/15/2016 00:32
S16T035701	16-08766-7-EFF-A	Ammonia	10/14/2016 09:00	10/15/2016 00:56
S16T035703	16-08766-7-EFF-B	Ammonia	10/14/2016 09:00	10/19/2016 16:46
S16T035704	16-08766-7-EFF-B	Ammonia	10/14/2016 09:00	10/19/2016 17:09
S16T035706	16-08766-7-EFF-C	Ammonia	10/14/2016 09:00	10/19/2016 17:33
S16T035707	16-08766-7-EFF-C	Ammonia	10/14/2016 09:00	10/19/2016 17:56
S16T035709	16-08766-7-EFF-D	Ammonia	10/14/2016 09:00	10/19/2016 21:01
S16T035710	16-08766-7-EFF-D	Ammonia	10/14/2016 09:00	10/19/2016 21:24
S16T035712	16-08766-7-EFF-E	Ammonia	10/14/2016 09:00	10/19/2016 21:47
S16T035713	16-08766-7-EFF-E	Ammonia	10/14/2016 09:00	10/19/2016 22:10
S16T035715	16-08766-7-EFF-F	Ammonia	10/14/2016 09:00	10/19/2016 22:33
S16T035716	16-08766-7-EFF-F	Ammonia	10/14/2016 09:00	10/19/2016 22:57
S16T035718	16-08766-7-EFF-G	Ammonia	10/14/2016 09:00	10/15/2016 10:11
S16T035719	16-08766-7-EFF-G	Ammonia	10/14/2016 09:00	10/15/2016 10:34
S16T035721	16-08766-7-EFF-H	Ammonia	10/14/2016 09:00	10/17/2016 14:21
S16T035722	16-08766-7-EFF-H	Ammonia	10/14/2016 09:00	10/15/2016 11:21
S16T035724	16-08766-7-IN-A	Ammonia	10/14/2016 09:00	10/17/2016 14:44
S16T035725	16-08766-7-IN-A	Ammonia	10/14/2016 09:00	10/15/2016 12:07
S16T035733	16-08766-7-IN-B	Ammonia	10/14/2016 09:00	10/17/2016 15:07
S16T035734	16-08766-7-IN-B	Ammonia	10/14/2016 09:00	10/15/2016 12:53
S16T035755	16-08766-7-IN-C	Ammonia	10/14/2016 09:00	10/17/2016 15:30
S16T035756	16-08766-7-IN-C	Ammonia	10/14/2016 09:00	10/15/2016 13:39
S16T035760	16-08766-7-IN-D	Ammonia	10/14/2016 09:00	10/17/2016 15:53
S16T035761	16-08766-7-IN-D	Ammonia	10/14/2016 09:00	10/15/2016 15:35
S16T035763	16-08766-7-IN-E	Ammonia	10/17/2016 13:40	10/19/2016 12:24
S16T035764	16-08766-7-IN-E	Ammonia	10/17/2016 13:40	10/18/2016 14:48
S16T035766	16-08766-7-IN-F	Ammonia	10/17/2016 13:40	10/19/2016 12:47
S16T035767	16-08766-7-IN-F	Ammonia	10/17/2016 13:40	10/18/2016 15:34
S16T035769	16-08766-7-IN-G	Ammonia	10/17/2016 13:40	10/19/2016 13:10
S16T035770	16-08766-7-IN-G	Ammonia	10/17/2016 13:40	10/18/2016 16:20
S16T035772	16-08766-7-IN-H	Ammonia	10/17/2016 13:40	10/19/2016 13:33
S16T035773	16-08766-7-IN-H	Ammonia	10/17/2016 13:40	10/18/2016 18:16

20163048 Rev. 0

Attachment 3

RECEIPT PAPERWORK

11 of 18

C.304

222-S

SAMPLE RECEIPT AND CHAIN OF CUSTODY
VERIFICATION CHECKLIST

ATS-LO-090-101 Rev DG-1

Date Samples Received: 10-3-16 Total Number of Samples: 480 Group #: 20163048 - NH3
 Sample Custodian: Diane Turner IH Technician: Diane Turner 10-3-16

Sample Custodian to Complete:

Action	Yes	No	N/A	Comments
RSR provided?			<input checked="" type="checkbox"/>	
Verify GKI is complete			<input checked="" type="checkbox"/>	<input type="checkbox"/> In Project File
Received from an alpha facility?		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> Contact PC for approval to release
Check that outer custody seal is intact, if present			<input checked="" type="checkbox"/>	
Record cooler temperature in centigrade, as appropriate	<u>3°C</u>			<input type="checkbox"/> Check if no cooler and/or no ice
Samples are intact and in good condition	<input checked="" type="checkbox"/>			If No, provide comments below
RSA/COC provided and complete containing the following information?				
• Client name and client sample number	<input checked="" type="checkbox"/>			
• Date and time of sampling	<input checked="" type="checkbox"/>			
• Sampling location or origin	<input checked="" type="checkbox"/>			
• Container type, size, and number	<input checked="" type="checkbox"/>			
• Preservatives (if used) noted on the COC/RSA and sample bottles			<input checked="" type="checkbox"/>	
• Analysis request is clear	<input checked="" type="checkbox"/>			
• Signature of persons relinquishing and receiving samples	<input checked="" type="checkbox"/>			
• Date and/or time of sample custody exchange	<input checked="" type="checkbox"/>			
Verify that sample numbers on containers match the COC and/or RSA	<input checked="" type="checkbox"/>			
Samples stored properly (e.g., refrigeration)	<input checked="" type="checkbox"/>			

Notify the PC immediately if any problems are noted. Any "No" checked boxes require PC resolution. For WRPS samples, the initials block below is completed by the responsible WRPS PC.

Samples acceptable for release? yes PC/SC Initials dlr Date 10-3-16

If No, comment on communication and resolution:

WRPS SHIP 280
 RUN 120
 WHL RUN 80 (40NH₃, 40H₂)
 Acetonitrile 40

Number of IH Samples Received:

Aldehyde Screen: <u>40</u>	Amines: <u>40</u>	Ammonia: <u>40</u>	Aromatic HC: _____	Asbestos: _____
Beryllium: _____	Be-Bulk: _____	Be-Filter: _____	Be-Wipe: _____	1,3-Butadiene: <u>80</u>
Formaldehyde: _____	Furans: <u>40</u>	Mercury: <u>40</u>	Methanol: _____	Nitrosamines: <u>40</u>
Nitrous Oxide: _____	Pyridines: <u>40</u>	SVOA: <u>40</u>	VOA: <u>40</u>	Other-IH: _____

A-6005-302 (REV 4)

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/1/16	
CACN: 202367	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
	16-08765-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08765-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08765-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08765-6-IN-H / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
516T035587	16-08765-7-BASE-EFF / CISA (SKC 226-29) * 516T035588 35589	NH3 Source	
516T035590	16-08765-7-BASE-IN / CISA (SKC 226-29) * 516T035591 35592	NH3 Source	
516T035593	16-08765-7-BLANK1 / CISA (SKC 226-29) * 516T035594 35595	NH3 Source	
516T035596	16-08765-7-BLANK2 / CISA (SKC 226-29) * 516T035598 35599	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:		Valerie Hendricks	2704 HU / rm H104
Retrieved from Storage:		BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:		BRETT GARNER	10-3-16
Received By:		Dianne Turner	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/11/16	
CACN: 202367	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
516T035604	16-08765-7-EFF-A / CISA (SKC 226-29)* 16-08765-7-EFF-A / CISA (SKC 226-29)* 516T035637 35639	NH3 Source	
516T035642	16-08765-7-EFF-B / CISA (SKC 226-29)* 16-08765-7-EFF-B / CISA (SKC 226-29)* 516T035643 35644	NH3 Source	
516T035645	16-08765-7-EFF-C / CISA (SKC 226-29)* 16-08765-7-EFF-C / CISA (SKC 226-29)* 516T035646 35647	NH3 Source	
516T035648	16-08765-7-EFF-D / CISA (SKC 226-29)* 16-08765-7-EFF-D / CISA (SKC 226-29)* 516T035649 35650	NH3 Source	
516T035651	16-08765-7-EFF-E / CISA (SKC 226-29)* 16-08765-7-EFF-E / CISA (SKC 226-29)* 516T035652 35653	NH3 Source	
516T035654	16-08765-7-EFF-F / CISA (SKC 226-29)* 16-08765-7-EFF-F / CISA (SKC 226-29)* 516T035655 35656	NH3 Source	
516T035657	16-08765-7-EFF-G / CISA (SKC 226-29)* 16-08765-7-EFF-G / CISA (SKC 226-29)* 516T035658 35659	NH3 Source	
516T035660	16-08765-7-EFF-H / CISA (SKC 226-29)* 16-08765-7-EFF-H / CISA (SKC 226-29)* 516T035661 35662	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:		Valerie Hendricks	ZR04H1 cmH104
Retrieved from Storage:		BRETT GARNER	10-3-16
	Signature	Printed Name	Date
Relinquished By:		BRETT GARNER	10-3-16
Received By:		Dianne Turner	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/1/16	
CACN: 202387	COA: CB20	Survey No.: 16-08765 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L.	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A.	MSIN: R1-06	Phone: (509)376-0737	
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
516T035663	16-08765-7-IN-A / CISA (SKC 226-29)* 516T035664 35665	NH3 Source	
516T035666	16-08765-7-IN-B / CISA (SKC 226-29)* 516T035667 35668	NH3 Source	
516T035669	16-08765-7-IN-C / CISA (SKC 226-29)* 516T035670 35671	NH3 Source	
516T035672	16-08765-7-IN-D / CISA (SKC 226-29)* 516T035673 35674	NH3 Source	
516T035675	16-08765-7-IN-E / CISA (SKC 226-29)* 516T035676 35677	NH3 Source	
516T035678	16-08765-7-IN-F / CISA (SKC 226-29)* 516T035679 35680	NH3 Source	
516T035681	16-08765-7-IN-G / CISA (SKC 226-29)* 516T035682 35683	NH3 Source	
516T035684	16-08765-7-IN-H / CISA (SKC 226-29)* 516T035685 35686	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:		Valerie Hendricks	2704HL/rm#1104
Retrieved from Storage:		BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:		BRETT GARNER	10-3-16
Received By:		Dianne Turner	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/11/16 10-2-16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
	16-08766-6-IN-E / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08766-6-IN-F / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08766-6-IN-G / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
	16-08766-6-IN-H / Hydrar (SKC 226-17-1A)	Hg-Elemental Source	
516T035687	16-08766-7-BASE-EFF / CISA (SKC 226-29)	516T035688 35689	NH3 Source
516T035690	16-08766-7-BASE-IN / CISA (SKC 226-29)	516T035691 35692	NH3 Source
516T035693	16-08766-7-BLANK-EFF / CISA (SKC 226-29)	516T035694 35695	NH3 Source
516T035696	16-08766-7-BLANK-IN / CISA (SKC 226-29)	516T035697 35698	NH3 Source
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704 HV rm H104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	10-3-16 0751
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/11/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L	Phone: (509)373-4966	Turnaround: N/A	
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
516T035699	16-08766-7-EFF-A / CISA (SKC 226-29) 16-08766-7-EFF-A / CISA (SKC 226-29) 516T035700 35701	NH3 Source	
516T035702	16-08766-7-EFF-B / CISA (SKC 226-29) 16-08766-7-EFF-B / CISA (SKC 226-29) 516T035703 35704	NH3 Source	
516T035705	16-08766-7-EFF-C / CISA (SKC 226-29) 16-08766-7-EFF-C / CISA (SKC 226-29) 516T035706 35707	NH3 Source	
516T035708	16-08766-7-EFF-D / CISA (SKC 226-29) 16-08766-7-EFF-D / CISA (SKC 226-29) 516T035709 35710	NH3 Source	
516T035711	16-08766-7-EFF-E / CISA (SKC 226-29) 16-08766-7-EFF-E / CISA (SKC 226-29) 516T035712 35713	NH3 Source	
516T035714	16-08766-7-EFF-F / CISA (SKC 226-29) 16-08766-7-EFF-F / CISA (SKC 226-29) 516T035715 35716	NH3 Source	
516T035717	16-08766-7-EFF-G / CISA (SKC 226-29) 16-08766-7-EFF-G / CISA (SKC 226-29) 516T035718 35719	NH3 Source	
516T035720	16-08766-7-EFF-H / CISA (SKC 226-29) 16-08766-7-EFF-H / CISA (SKC 226-29) 516T035721 35722	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:	<i>[Signature]</i>	Valerie Hendricks	2704HVrm H104
Retrieved from Storage:	<i>[Signature]</i>	BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:	<i>[Signature]</i>	BRETT GARNER	10-3-16
Received By:	<i>[Signature]</i>	TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

INDUSTRIAL HYGIENE CHAIN OF CUSTODY AND LABORATORY REQUEST

Contractor: Washington River Protection Solutions		Date Sampled: 10/1/16 + 10/2/16	
CACN: 202367	COA: CB20	Survey No.: 16-08766 - Cartridge Testing AN Stack - A Train	
Contact Name: Jones, Parker L		Phone: (509)373-4966	Turnaround: N/A
Return Report To: Caldwell, Joyce A		MSIN: R1-06	Phone: (509)376-0737
Laboratory Log No.	Sample ID/Type/Description	Required Analysis	
516T035723	16-08766-7-IN-A / CISA (SKC 226-29) 516T035724 35725	NH3 Source	
516T035726	16-08766-7-IN-B / CISA (SKC 226-29) 516T035733 35734	NH3 Source	
516T035753	16-08766-7-IN-C / CISA (SKC 226-29) 516T035755 35756	NH3 Source	
516T035759	16-08766-7-IN-D / CISA (SKC 226-29) 516T035760 35761	NH3 Source	
516T035762	16-08766-7-IN-E / CISA (SKC 226-29) 516T035763 35764	NH3 Source	
516T035765	16-08766-7-IN-F / CISA (SKC 226-29) 516T035766 35767	NH3 Source	
516T035768	16-08766-7-IN-G / CISA (SKC 226-29) 516T035769 35770	NH3 Source	
516T035771	16-08766-7-IN-H / CISA (SKC 226-29) 516T035772 35773	NH3 Source	
Special Instructions:			
	Signature	Printed Name	Location
Delivered to Storage:		Valerie Hendricks	2704 HV rm H104
Retrieved from Storage:		BRETT GARNER	
	Signature	Printed Name	Date
Relinquished By:		BRETT GARNER	10-3-16
Received By:		TERESA FORRESTER	10-3-16
Relinquished By:			
Received By:			
Relinquished By:			
Received By:			
Additional Comments:			

C.3.8 Aldehydes



ANALYTICAL REPORT

Report Date: October 12, 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
20163058

Workorder: **34-1627925**

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

Analytical Results

Sample ID: S16T035234		Collected: 10/01/2016		
Lab ID: 1627925001		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.14	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	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: S16T035235		Collected: 10/01/2016		
Lab ID: 1627925002		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.069	NA	NA	0.050
Acetaldehyde	0.096	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035235		Collected: 10/01/2016		
Lab ID: 1627925002		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Acetone	0.20	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	0.090	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035236		Collected: 10/01/2016		
Lab ID: 1627925003		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.057	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035237		Collected: 10/01/2016		
Lab ID: 1627925004		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.13	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: S16T035238		Collected: 10/01/2016		
Lab ID: 1627925005		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.053	NA	NA	0.050
Acetaldehyde	0.32	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035238		Collected: 10/01/2016		
Lab ID: 1627925005		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035239		Collected: 10/01/2016		
Lab ID: 1627925006		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.29	NA	NA	0.050
Acetone	0.14	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	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: S16T035240		Collected: 10/01/2016		
Lab ID: 1627925007		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.054	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	0.062	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035240		Collected: 10/01/2016		
Lab ID: 1627925007		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035241		Collected: 10/01/2016		
Lab ID: 1627925008		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	0.17	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035242		Collected: 10/01/2016		
Lab ID: 1627925009		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.33	NA	NA	0.050
Acetone	0.36	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: S16T035243		Collected: 10/01/2016		
Lab ID: 1627925010		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.060	NA	NA	0.050
Acetaldehyde	0.37	NA	NA	0.050
Acetone	0.43	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035243		Collected: 10/01/2016		
Lab ID: 1627925010		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035244		Collected: 10/01/2016		
Lab ID: 1627925011		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.28	NA	NA	0.050
Acetone	0.055	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: S16T035245		Collected: 10/01/2016		
Lab ID: 1627925012		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.35	NA	NA	0.050
Acetone	0.095	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035245		Collected: 10/01/2016		
Lab ID: 1627925012		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035246		Collected: 10/01/2016		
Lab ID: 1627925013		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.37	NA	NA	0.050
Acetaldehyde	0.61	NA	NA	0.050
Acetone	0.94	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.12	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	0.16	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035247		Collected: 10/01/2016		
Lab ID: 1627925014		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.12	NA	NA	0.050
Acetaldehyde	0.59	NA	NA	0.050
Acetone	0.63	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.11	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	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	0.084	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035248		Collected: 10/01/2016		
Lab ID: 1627925015		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.16	NA	NA	0.050
Acetaldehyde	0.62	NA	NA	0.050
Acetone	0.68	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	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	0.13	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035248		Collected: 10/01/2016		
Lab ID: 1627925015		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035249		Collected: 10/01/2016		
Lab ID: 1627925016		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.13	NA	NA	0.050
Acetaldehyde	0.60	NA	NA	0.050
Acetone	0.53	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.14	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.083	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	0.080	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035250		Collected: 10/01/2016		
Lab ID: 1627925017		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.083	NA	NA	0.050
Acetaldehyde	0.55	NA	NA	0.050
Acetone	0.57	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.12	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035250		Collected: 10/01/2016		
Lab ID: 1627925017		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.079	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	0.12	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035251		Collected: 10/01/2016		
Lab ID: 1627925018		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.19	NA	NA	0.050
Acetaldehyde	0.58	NA	NA	0.050
Acetone	0.59	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.12	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.092	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	0.067	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035252		Collected: 10/01/2016		
Lab ID: 1627925019		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.058	NA	NA	0.050
Acetaldehyde	0.12	NA	NA	0.050
Acetone	0.35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.063	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035253		Collected: 10/01/2016		
Lab ID: 1627925020		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.14	NA	NA	0.050
Acetaldehyde	0.57	NA	NA	0.050
Acetone	0.41	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.089	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	0.052	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035253		Collected: 10/01/2016		
Lab ID: 1627925020		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035254		Collected: 10/02/2016		
Lab ID: 1627925021		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
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: S16T035255		Collected: 10/02/2016		
Lab ID: 1627925022		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.052	NA	NA	0.050
Acetaldehyde	0.083	NA	NA	0.050
Acetone	0.30	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035255		Collected: 10/02/2016		
Lab ID: 1627925022		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035256		Collected: 10/02/2016		
Lab ID: 1627925023		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035257		Collected: 10/02/2016		
Lab ID: 1627925024		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	<0.050	NA	NA	0.050
Acetone	0.22	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: S16T035258		Collected: 10/02/2016		
Lab ID: 1627925025		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.063	NA	NA	0.050
Acetaldehyde	0.29	NA	NA	0.050
Acetone	0.23	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035258		Collected: 10/02/2016		
Lab ID: 1627925025		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035259		Collected: 10/02/2016		
Lab ID: 1627925026		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035260		Collected: 10/02/2016		
Lab ID: 1627925027		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.34	NA	NA	0.050
Acetone	0.12	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035260		Collected: 10/02/2016		
Lab ID: 1627925027		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035261		Collected: 10/02/2016		
Lab ID: 1627925028		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.36	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035262		Collected: 10/02/2016		
Lab ID: 1627925029		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.29	NA	NA	0.050
Acetone	0.060	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: S16T035263		Collected: 10/02/2016		
Lab ID: 1627925030		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.33	NA	NA	0.050
Acetone	<0.050	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	<0.050	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050

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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035263		Collected: 10/02/2016		
Lab ID: 1627925030		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035264		Collected: 10/02/2016		
Lab ID: 1627925031		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.31	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: S16T035265		Collected: 10/02/2016		
Lab ID: 1627925032		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	<0.050	NA	NA	0.050
Acetaldehyde	0.30	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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ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035265		Collected: 10/02/2016		
Lab ID: 1627925032		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	<0.050	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	<0.050	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035266		Collected: 10/02/2016		
Lab ID: 1627925033		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.33	NA	NA	0.050
Acetaldehyde	0.57	NA	NA	0.050
Acetone	0.24	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	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	0.10	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035267		Collected: 10/02/2016		
Lab ID: 1627925034		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.31	NA	NA	0.050
Acetaldehyde	0.58	NA	NA	0.050
Acetone	0.63	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.13	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.082	NA	NA	0.050
Benzaldehyde	<0.050	NA	NA	0.050
Isovaleraldehyde	<0.050	NA	NA	0.050
Valeraldehyde	<0.050	NA	NA	0.050
m-Tolualdehyde	<0.050	NA	NA	0.050
p-Tolualdehyde	<0.050	NA	NA	0.050
o-Tolualdehyde	<0.050	NA	NA	0.050
Hexanal	0.11	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035268		Collected: 10/02/2016		
Lab ID: 1627925035		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Sampling Location: CARTRIDGE EVALUATION				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.093	NA	NA	0.050
Acetaldehyde	0.53	NA	NA	0.050
Acetone	0.66	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.10	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.090	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	0.088	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035268		Collected: 10/02/2016		
Lab ID: 1627925035		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035269		Collected: 10/02/2016		
Lab ID: 1627925036		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.17	NA	NA	0.050
Acetaldehyde	0.55	NA	NA	0.050
Acetone	0.48	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.10	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.11	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	0.12	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035270		Collected: 10/02/2016		
Lab ID: 1627925037		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/07/2016		
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.088	NA	NA	0.050
Acetaldehyde	0.52	NA	NA	0.050
Acetone	0.40	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.11	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: 34-1627925

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035270		Collected: 10/02/2016		
Lab ID: 1627925037		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.078	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	0.068	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Sample ID: S16T035271		Collected: 10/02/2016		
Lab ID: 1627925038		Received: 10/05/2016		
Sampling Location: CARTRIDGE EVALUATION				
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Analyzed: 10/07/2016				
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.079	NA	NA	0.050
Acetaldehyde	0.51	NA	NA	0.050
Acetone	0.48	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.087	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.096	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	0.058	NA	NA	0.050
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035272		Collected: 10/02/2016		
Lab ID: 1627925039		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.081	NA	NA	0.050
Acetaldehyde	0.52	NA	NA	0.050
Acetone	0.49	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.094	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.066	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: S16T035586		Collected: 10/02/2016		
Lab ID: 1627925040		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Formaldehyde	0.085	NA	NA	0.050
Acetaldehyde	0.56	NA	NA	0.050
Acetone	0.35	NA	NA	0.050
Acrolein	<0.050	NA	NA	0.050
Propionaldehyde	0.098	NA	NA	0.050
Crotonaldehyde	<0.050	NA	NA	0.050
Butyraldehyde	0.090	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	0.055	NA	NA	0.050

Results Continued on Next Page



ANALYTICAL REPORT

Workorder: **34-1627925**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035586		Collected: 10/02/2016		
Lab ID: 1627925040		Received: 10/05/2016		
Method: EPA TO-11A		Media: SKC 226-119, Silica Gel (2,4-Dinitrophenylhydrazine)		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
2,5-Dimethylbenzaldehyde	<0.050	NA	NA	0.050

Comments

Quality Control: **EPA TO-11A - (HBN: 178042)**

LMB 521641 was used to media blank correct LCS 521642, LCSD 521643 and field samples 001-020 for Acetone only.

LCS 521642/LCSD 521643: 2,5-Dimethylbenzaldehyde recovery is outside of established limits but within general laboratory limits within 10% recovery for both LCS/LCSD. No further action was taken. Historical limits have been submitted for review.

Quality Control: **EPA TO-11A - (HBN: 178043)**

LMB 521644 was used to media blank correct LCS 521645, LCSD 521646 and field samples for Acetone only.

LCS 521645/LCSD 521646: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.

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

Method	Analyst	Peer Review
EPA TO-11A	/S/ Emilie Pratt 10/11/2016 13:44	/S/ Christopher Winter 10/12/2016 11:32

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com



ANALYTICAL REPORT

Workorder: **34-1627925**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: **1627925**

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: ILC/12817 (HBN: 178042)
Analyzed By: Emilie Pratt

Blank

LMB: 521641			
Analyzed: 10/07/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.129	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521642					LCS: 521643				
Analyzed: 10/07/2016 00:00					Analyzed: 10/07/2016 00:00				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.93	3.00	97.6	87.8 116.8	2.98	99.2	1.63	0.0 20.0	
Acetaldehyde	2.97	3.00	98.9	94.7 110.5	3.00	99.8	0.973	0.0 20.0	
Acetone	3.08	3.00	103	69.2 119.9	3.13	104	1.71	0.0 20.0	
Acrolein	2.91	3.00	97.0	83.5 120.2	2.92	97.3	0.377	0.0 20.0	
Propionaldehyde	2.88	3.00	95.9	92.2 117.2	2.92	97.2	1.38	0.0 20.0	
Crotonaldehyde	3.00	3.00	100	93.1 114.8	2.96	98.6	1.44	0.0 20.0	
Butyraldehyde	2.85	3.00	94.9	86.6 120.8	2.80	93.4	1.56	0.0 20.0	
Benzaldehyde	2.89	3.00	96.5	96.0 112.3	2.94	97.9	1.44	0.0 20.0	
Isovaleraldehyde	3.08	3.00	103	95.4 121.6	3.09	103	0.292	0.0 20.0	
Valeraldehyde	3.15	3.00	105	85.3 120.4	3.25	108	2.91	0.0 20.0	
m-Tolualdehyde	3.06	3.00	102	80.9 118.6	3.13	104	2.46	0.0 20.0	
p-Tolualdehyde	2.63	3.00	87.7	83.5 122.2	2.64	88.0	0.380	0.0 20.0	
o-Tolualdehyde	2.90	3.00	96.5	91.6 111.4	2.93	97.7	1.24	0.0 20.0	
Hexanal	3.14	3.00	105	85.4 127.6	3.29	110	4.82	0.0 20.0	
2,5-Dimethylbenzaldehyde	2.70	3.00	* 90.0	99.6 118.7	2.75	* 91.5	1.65	0.0 20.0	



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: EPA TO-11A

Batch: ILC/12817 (HBN: 178042)

Analyzed By: Emilie Pratt

Comments

LMB 521641 was used to media blank correct LCS 521642, LCSD 521643 and field samples 001-020 for Acetone only.

LCS 521642/LCSD 521643: 2,5-Dimethylbenzaldehyde recovery is outside of established limits but within general laboratory limits within 10% recovery for both LCS/LCSD. No further action was taken. Historical limits have been submitted for review.

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

Analyst	Peer Review
/S/ Emilie Pratt 10/11/2016 12:52	/S/ Christopher Winter 10/12/2016 11:21

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: 1627925

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: EPA TO-11A
Batch: ILC/12818 (HBN: 178043)
Analyzed By: Emilie Pratt

Blank

LMB: 521644			
Analyzed: 10/07/2016 00:00			
Units: ug/sample			
Analyte	Result	MDL	RL
Formaldehyde	ND	NA	0.0500
Acetaldehyde	ND	NA	0.0500
Acetone	0.134	NA	0.0500
Acrolein	ND	NA	0.0500
Propionaldehyde	ND	NA	0.0500
Crotonaldehyde	ND	NA	0.0500
Butyraldehyde	ND	NA	0.0500
Benzaldehyde	ND	NA	0.0500
Isovaleraldehyde	ND	NA	0.0500
Valeraldehyde	ND	NA	0.0500
m-Tolualdehyde	ND	NA	0.0500
p-Tolualdehyde	ND	NA	0.0500
o-Tolualdehyde	ND	NA	0.0500
Hexanal	ND	NA	0.0500
2,5-Dimethylbenzaldehyde	ND	NA	0.0500

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521645					LCS: 521646				
Analyzed: 10/07/2016 00:00					Analyzed: 10/07/2016 00:00				
Dilution: 1					Dilution: 1				
Units: ug/sample					Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Formaldehyde	2.86	3.00	95.2	87.8 116.8	2.96	98.8	3.75	0.0	20.0
Acetaldehyde	2.89	3.00	96.3	94.7 110.5	2.98	99.3	3.07	0.0	20.0
Acetone	2.99	3.00	99.6	69.2 119.9	3.15	105	5.25	0.0	20.0
Acrolein	2.79	3.00	93.1	83.5 120.2	2.93	97.6	4.76	0.0	20.0
Propionaldehyde	2.80	3.00	93.5	92.2 117.2	2.90	96.8	3.47	0.0	20.0
Crotonaldehyde	2.91	3.00	96.9	93.1 114.8	2.92	97.2	0.378	0.0	20.0
Butyraldehyde	2.79	3.00	92.9	86.6 120.8	2.88	95.8	3.14	0.0	20.0
Benzaldehyde	2.85	3.00	95.1	96.0 112.3	2.91	97.0	1.91	0.0	20.0
Isovaleraldehyde	2.97	3.00	99.0	95.4 121.6	3.07	102	3.18	0.0	20.0
Valeraldehyde	3.11	3.00	104	85.3 120.4	3.20	107	2.85	0.0	20.0
m-Tolualdehyde	2.86	3.00	95.3	80.9 118.6	3.13	104	8.92	0.0	20.0
p-Tolualdehyde	2.67	3.00	89.1	83.5 122.2	2.51	83.7	6.21	0.0	20.0
o-Tolualdehyde	2.82	3.00	93.8	91.6 111.4	2.93	97.8	4.14	0.0	20.0
Hexanal	3.20	3.00	107	85.4 127.6	3.28	109	2.50	0.0	20.0
2,5-Dimethylbenzaldehyde	2.71	3.00	90.4	99.6 118.7	2.70	90.0	0.407	0.0	20.0



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627925

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: EPA TO-11A

Batch: ILC/12818 (HBN: 178043)

Analyzed By: Emilie Pratt

Comments

LMB 521644 was used to media blank correct LCS 521645, LCSD 521646 and field samples for Acetone only.

LCS 521645/LCSD 521646: All of the analytes recovered within +/- 10% of the target concentration. A few analytes are outside of established limits but within general laboratory limits. No further action was taken. Historical limits have been submitted for review.

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

Analyst	Peer Review
/S/ Emilie Pratt 10/11/2016 13:44	/S/ Christopher Winter 10/12/2016 11:32

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

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20163058 Page 2 of 4	
Collector FORES	Contactor/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN 16-05 FAX 372-1878			
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 20303/020					
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ice Chest No. 445-047		Temp. 04°C			
Shipped To (Lab)	Method of Shipment	Bill of Lading/Air Bill No. 7773 8817 9518					
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No. 41402					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
11	S167035244	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-EFF-G	25C or low	
12	S167035245	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-EFF-H	25C or low	
13	S167035246	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-A	25C or low	
14	S167035247	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-B	25C or low	
15	S167035248	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-C	25C or low	
16	S167035249	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-D	25C or low	
17	S167035250	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-E	25C or low	
18	S167035251	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-F	25C or low	
19	S167035252	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-G	25C or low	
20	S167035253	VA 10/1/16		SILICA GEL	Aldehyde 16-08765-8-IN-H	25C or low	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No Send Results to Carl Howard IV and Greg Scanlan Scanlan: gscanl@delphi.gov and gscanl@scantia821.gov see SOX for email Release 9 Contract # 55502 NIOSH 2016 RDD							
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
TELESA FORRESTER	10-4-16-1000		10-4-16-1000	Julie Graham	10-4-16-1000		10-4-16-1000
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
JA Gradshtaf	10-4-16-1400		10-4-16-1400	Julie Graham	10-4-16-1400		10-4-16-1400
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
WRPS	10-4-16-1400		10-4-16-1400	Julie Graham	10-4-16-1400		10-4-16-1400
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
				Julie Graham	10-4-16-1400		10-4-16-1400
Disposal Method (e.g., Return to customer, per lab procedure) (used in process) Disposed By: Emilee R Pratt Date/Time: 10/7/16 17:20							

A-6003-962 (03/05)

Assembler		C.O.C. No. 20163058				
N/A		Page 3 of 4				
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						
Collector	Contract/Requestor	Telephone No.	MSIN			
Boxes	Case: HOWARD IV	373-6861	76-05 FAX 372-1878			
SAP No.	Sample Origin	Purchase Order/Charge Code				
N/A	CAUTION: EVALUATION	205037620				
Project Title	Logbook/ Work Package No.	Ice Chest No.	Temp.			
HAZARDOUS EVALUATION	N/A	WJG-047	02103			
Shipped To (Lab)	Method of Shipment	Bill of Lading/Air Bill No.	7723 8817 9518			
N/A	N/A	Parts and Return No.	41482			
Protocol	Date Turnaround	Preservative				
N/A	10 DAYS	25C or low				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
21	S16T035254	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EASE-EFF	25C or low
22	S16T035255	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EASE-IN	25C or low
23	S16T035256	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-BLANK-EFF	25C or low
24	S16T035257	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-BLANK-IN	25C or low
25	S16T035258	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-A	25C or low
26	S16T035259	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-B	25C or low
27	S16T035260	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-C	25C or low
28	S16T035261	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-D	25C or low
29	S16T035262	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-E	25C or low
30	S16T035263	VA 10/2/16		SILICA GEL	Aldehyde 16-08766-8-EFF-F	25C or low
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Hold Time						
EPA TO-11A Send Results to Carl Howard IV and Greg Scanlan Carl W. Howard@rl.gov and Gregory J. Scanlan@rl.gov see SON for email Release Contract # 55502 Release Contract # 55502 NIOSH 2015 MOD						
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign
THESA BORESTER James Tancos			10-4-16 1000	Julie Gradich		10/4/16 1000
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign
WRPS			10/4/16 1000	FEDEX		10/4/16 10:32
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign
			10/4/16 10:32			10/4/16 10:32
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign
			10/4/16 10:32			10/4/16 10:32
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process)						
Disposed By: <i>Emilie R Pratt</i> Date/Time: 10/7/16 17:20						

A-6003-562 (03/05)

Assembler		C.O.C. No. 20163058	
N/A		Page 4 of 4	
Collector		Contact/Requestor	
N/A		Caso, Howard IV	
SAF No.		MSIN	
N/A		76-05 FAX 372-1878	
Project Title		Purchase Order/Charge Code	
CARTIDGE EVALUATION		203037/020	
Shipped To (Lab)		Ice Chest No.	
N/A		WTS-047	
Method of Shipment		Temp.	
N/A		62ICE	
Data Turnaround		Bill of Lading/Air Bill No.	
10 DAYS		773 8817 9518	
Protocol		Parts and Return No.	
N/A		41402	

Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
31	S167035264	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-EFF-G	25C or low
32	S167035265	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-EFF-H	25C or low
33	S167035266	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-A	25C or low
34	S167035267	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-B	25C or low
35	S167035268	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-C	25C or low
36	S167035269	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-D	25C or low
37	S167035270	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-E	25C or low
38	S167035271	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-F	25C or low
39	S167035272	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-G	25C or low
40	S167035286	VA	10/2/16	SILICA GEL	Aldehyde 16-08766-8-IN-H	25C or low

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS ☐ Yes ☒ No

SPECIAL INSTRUCTIONS
 Send Results to Carl Howald IV and Greg Scanlan
 Scanlan: gscanl@del.gov and gscanl@del.gov
 Gregory: gscanl@del.gov see SCW for email
 Release 9
 Reference Contract # 55502
 N/A 2016 3058

Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
JECESSA FORCES/STC Team	10-4-16 1000	10-4-16 1000	10-4-16 1000	Julius Gaudin	10-4-16 1000	10-4-16 1000	10-4-16 1000
WRPS	10-4-16 1400	10-4-16 1400	10-4-16 1400	Julius Gaudin	10-4-16 1400	10-4-16 1400	10-4-16 1400
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time

FINAL SAMPLE DISPOSITION	Disposal Method (e.g., Return to customer, per lab procedure, used in process)	Date/Time
Disposal Method (e.g., Return to customer, per lab procedure, used in process)	10/4/16 17:20	10/4/16 17:20

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

C.3.9 1, 3-Butadiene



ANALYTICAL REPORT

Report Date: October 12, 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
20163063

Workorder: 34-1627932

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

Analytical Results

Sample ID: S16T035414		Collected: 10/01/2016	
Lab ID: 1627932001		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035415		Collected: 10/01/2016	
Lab ID: 1627932002		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035416		Collected: 10/01/2016	
Lab ID: 1627932003		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035417		Collected: 10/01/2016	
Lab ID: 1627932004		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

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ALS GROUP USA, CORP. An ALS Limited Company

Environmental

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: 34-1627932

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035418		Collected: 10/01/2016	
Lab ID: 1627932005		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016	
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)
1,3-Butadiene	<0.0010	NA	NA

Sample ID: S16T035419		Collected: 10/01/2016	
Lab ID: 1627932006		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016	
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)
1,3-Butadiene	<0.0010	NA	NA

Sample ID: S16T035420		Collected: 10/01/2016	
Lab ID: 1627932007		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016	
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)
1,3-Butadiene	<0.0010	NA	NA

Sample ID: S16T035421		Collected: 10/01/2016	
Lab ID: 1627932008		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016	
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)
1,3-Butadiene	<0.0010	NA	NA

Sample ID: S16T035422		Collected: 10/01/2016	
Lab ID: 1627932009		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016	
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)
1,3-Butadiene	<0.0010	NA	NA



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035423		Collected: 10/01/2016		
Lab ID: 1627932010		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035424		Collected: 10/01/2016		
Lab ID: 1627932011		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
Analyzed: 10/11/2016				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035425		Collected: 10/01/2016		
Lab ID: 1627932012		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035426		Collected: 10/01/2016		
Lab ID: 1627932013		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035427		Collected: 10/01/2016		
Lab ID: 1627932014		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035428		Collected: 10/01/2016	
Lab ID: 1627932015		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035429		Collected: 10/01/2016	
Lab ID: 1627932016		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035430		Collected: 10/01/2016	
Lab ID: 1627932017		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035431		Collected: 10/01/2016	
Lab ID: 1627932018		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035432		Collected: 10/01/2016	
Lab ID: 1627932019		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035433		Collected: 10/01/2016	
Lab ID: 1627932020		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035434		Collected: 10/01/2016	
Lab ID: 1627932021		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035435		Collected: 10/01/2016	
Lab ID: 1627932022		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035436		Collected: 10/01/2016	
Lab ID: 1627932023		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035437		Collected: 10/01/2016	
Lab ID: 1627932024		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035438		Collected: 10/01/2016	
Lab ID: 1627932025		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035439		Collected: 10/01/2016	
Lab ID: 1627932026		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035440		Collected: 10/01/2016	
Lab ID: 1627932027		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035441		Collected: 10/01/2016	
Lab ID: 1627932028		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035442		Collected: 10/01/2016	
Lab ID: 1627932029		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035443		Collected: 10/01/2016		
Lab ID: 1627932030		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035444		Collected: 10/01/2016		
Lab ID: 1627932031		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
Sampling Parameter: Air Volume Not Provided		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035445		Collected: 10/01/2016		
Lab ID: 1627932032		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
Sampling Location: CARTRIDGE EVALUATION		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035446		Collected: 10/01/2016		
Lab ID: 1627932033		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035447		Collected: 10/01/2016		
Lab ID: 1627932034		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035448		Collected: 10/01/2016	
Lab ID: 1627932035		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035449		Collected: 10/01/2016	
Lab ID: 1627932036		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035450		Collected: 10/01/2016	
Lab ID: 1627932037		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035451		Collected: 10/01/2016	
Lab ID: 1627932038		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035452		Collected: 10/01/2016	
Lab ID: 1627932039		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627932**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035453		Collected: 10/01/2016		
Lab ID: 1627932040		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

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

Method	Analyst	Peer Review
NIOSH 1024	/S/ Fred Rejali 10/11/2016 22:21	/S/ Thomas J. Masoian 10/12/2016 07:58

Laboratory Contact Information

ALS Environmental
960 W Levoe Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alslc.com



ANALYTICAL REPORT

Workorder: **34-1627932**

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)	DATA 1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwl/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/insideDNR/RegulatoryWater.aspx
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qalab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	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.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

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

< This testing result is less than the numerical value.

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

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: **1627932**

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: NIOSH 1024

Batch: IFID/7832 (HBN: 178101)

Analyzed By: Fred Rejali

Blank

MB: 521250 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521744 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521747 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521750 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521753 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521756 Analyzed: 10/11/2016 00:00 Units: mg/sample			
Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521251 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521252 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0334	0.0342	97.7	78.0 117.6	0.0331	96.8	0.902	0.0 20.0	



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627932

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: NIOSH 1024

Batch: IFID/7832 (HBN: 178101)

Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521745 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521746 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0365	0.0342	107	78.0 117.6	0.0365	107	0.00	0.0 20.0	
LCS: 521748 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521749 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0350	0.0342	102	78.0 117.6	0.0342	100	2.31	0.0 20.0	
LCS: 521751 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521752 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0330	0.0342	96.5	78.0 117.6	0.0350	102	5.88	0.0 20.0	
LCS: 521754 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521755 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0308	0.0308	100	78.0 117.6	0.0323	105	4.82	0.0 20.0	
LCS: 521757 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521758 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0304	0.0308	98.8	78.0 117.6	0.0312	101	2.53	0.0 20.0	

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

Analyst	Peer Review
/S/ Fred Rejali 10/11/2016 22:21	/S/ Thomas J. Masoian 10/12/2016 07:58

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



1627932

1607432

CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A		C.O.C. No. 20163063 Page 1 of 4							
Collector JONES	Contact/Requestor CARL HOWARD IV		Telephone No. 373-6951		MSIN T6-05 FAX 372-1878				
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 203003/CB20						
Project Title CARTRIDGE EVALUATION	Logbook/ Work Package No. N/A		Ice Chest No. WTS-047		Temp. 00.1°C				
Shipped To (Lab) ALS	Method of Shipment		Bill of Lading/Air Bill No. 7223 8817 9518						
Protocol N/A	Data Turnaround 10 DAYS		Parts and Return No. 41403						
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis		Preservative		
	S167035414	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-BLANK1		CHILL -4C		
	S167035415	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-BLANK1		CHILL -4C		
	S167035416	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-BLANK2		CHILL -4C		
	S167035417	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-BLANK2		CHILL -4C		
	S167035418	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-A-PRT-A		CHILL -4C		
	S167035419	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-A-PRT-B		CHILL -4C		
	S167035420	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-B-PRT-A		CHILL -4C		
	S167035421	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-B-PRT-B		CHILL -4C		
	S167035422	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-C-PRT-A		CHILL -4C		
	S167035423	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-C-PRT-B		CHILL -4C		
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No									
SPECIAL INSTRUCTIONS Send Results to Carl W Howard IV, Carl W Howard81.gov, and Greg Scanlan, Gregory J. Scanlan81.gov see SON for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C									
Relinquished By Dianne Turner	Print 10/4/16	Sign Dianne Turner	Date/Time 10/4/16 10:00	Received By RE Bogners	Print 10/4/16	Sign RE Bogners	Date/Time 10/4/16 10:00	Matrix* DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other	
Relinquished By RE Bogners	Print 10/4/16	Sign RE Bogners	Date/Time 10/4/16 10:00	Received By Dianne Turner	Print 10/4/16	Sign Dianne Turner	Date/Time 10/4/16 10:00	Matrix* DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix* DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation VA = Vapor X = Other	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)								Date/Time 10/11/16 2100	
Disposal Method (e.g., Return to customer, per lab procedure, used in process)								Date/Time 10/11/16 2100	

A-6003-962 (03/05)

Assembler N/A		C.O.C. No. 20163063 Page 2 of 4			
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No.	373-6961	MSIN	FAX 372-1878
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code	203003/CB20		
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No. N/A	Ins Chest No.	Temp. 645-047 ON ICE		
Shipped To (Lab) ALS	Method of Shipment	Bill of Lading/Air Bill No.	7773 8817 9518		
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No.	41402		
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative
	S16T035424	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-D-PRT-A	CHILL -4C
	S16T035425	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-D-PRT-B	CHILL -4C
	S16T035426	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-E-PRT-A	CHILL -4C
	S16T035427	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-E-PRT-B	CHILL -4C
	S16T035428	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-F-PRT-A	CHILL -4C
	S16T035429	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-F-PRT-B	CHILL -4C
	S16T035430	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-G-PRT-A	CHILL -4C
	S16T035431	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-G-PRT-B	CHILL -4C
	S16T035432	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EF-H-PRT-A	CHILL -4C
	S16T035433	VA 10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EF-H-PRT-B	CHILL -4C
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No Hold Time SPECIAL INSTRUCTIONS Send Results to Carl W Howard IV, Carl W Howard@ri.gov, and Greg Scanlan, Gregory_I_Scanlan@ri.gov see SON for email Reference Contract # 55302 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C					
Relinquished By Dianne Turner	Print 10/4/16 10:00	Sign [Signature]	Received By RE Express	Print 10/4/16 12:00	Date/Time 10/4/16 12:00
Relinquished By Vicki	Print 10/4/16 1400	Sign [Signature]	Received By FEDEX	Print 10/5/16 10:00	Date/Time 10/5/16 10:00
Relinquished By Fred	Print 10/11/16 2100	Sign [Signature]	Received By Fred Rajak	Print 10/11/16 2100	Date/Time 10/11/16 2100
Disposal Method (e.g., Return to customer, per lab procedure used in process) Disposed By Fred Rajak					
FINAL SAMPLE DISPOSITION All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.					

Assembler		C.O.C. No. 20163063						
S/A		Page 3 of 4						
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST								
Collector	Requestor	Telephone No.	MSIN					
JONES	CARL HOWARD IV	373-6661	76-05					
SAF No.	Sample Origin	Purchase Order/Charge Code						
N/A	CARTRIDGE EVALUATION	203003/CB20						
Project Title	Logbook/Work Package No.	Ice Chest No.	Temp.					
CARTRIDGE EVALUATION	S/A	WTS-047	00.15					
Shipped To (Lab)	Method of Shipment	Bill of Lading/Air Bill No.						
AUS		7773 8817 9518						
Protocol	Date Turnaround	Parts and Return No.						
N/A	10 DAYS	41402						
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative		
	S16T035434	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-EFF-BASE-A	CHILL -4C		
	S16T035435	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-EFF-BASE-B	CHILL -4C		
	S16T035436	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-A-PRT-A	CHILL -4C		
	S16T035437	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-A-PRT-B	CHILL -4C		
	S16T035438	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-B-PRT-A	CHILL -4C		
	S16T035439	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-B-PRT-B	CHILL -4C		
	S16T035440	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-BASE-A	CHILL -4C		
	S16T035441	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-BASE-B	CHILL -4C		
	S16T035442	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-C-PRT-A	CHILL -4C		
	S16T035443	VA	10/01/16	CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-C-PRT-B	CHILL -4C		
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl W. Howald IV, Carl W. Howald@rl.gov, and Greg Scanlan, Gregory_L_Scanlan@rl.gov see SOW for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C								
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
Dianne Turner			10/4/16 1400	RE Lopez			10/4/16 1400	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water VA = Vapor X = Other DL = Drum Liquids T = Tissue WI = Wipe L = Liquid V = Vegetation O = Oil A = Air DS = Drum Solids
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
RE Lopez			10/4/16 1400	RE Lopez			10/4/16 1400	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
RE Lopez			10/4/16 1400	RE Lopez			10/4/16 1400	
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	
RE Lopez			10/4/16 1400	RE Lopez			10/4/16 1400	
Disposal Method (e.g., Return to customer, per lab procedure) used in process Disposed By: Fred Rejali 10/11/16 2100								
FINAL SAMPLE DISPOSITION All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.								

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20163063	
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No.	373-8861	MSIN	16-05	FAX	372-1878
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code	203003/C820	Temp.			
Project Title CARTRIDGE EVALUATION	Logbook/Work Package No.	Ice Chest No.	WTS-047	Temp.			
Shipped To (Lab) AUS	Method of Shipment	Bill of Lading/Air Bill No.	2773 8817 9518	Parts and Return No.	41403		
Protocol N/A	Data Turnaround 10 DAYS						
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative	
S167035444	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-D-FRT-A	CHILL -4C	
S167035445	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-D-FRT-B	CHILL -4C	
S167035446	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-E-FRT-A	CHILL -4C	
S167035447	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-E-FRT-B	CHILL -4C	
S167035448	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-F-FRT-A	CHILL -4C	
S167035449	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-F-FRT-B	CHILL -4C	
S167035450	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-G-FRT-A	CHILL -4C	
S167035451	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-G-FRT-B	CHILL -4C	
S167035452	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-9-IN-H-FRT-A	CHILL -4C	
S167035453	VA	10/01/16		CHARCOAL TUBE	1,3-Butadiene 16-08765-10-IN-H-FRT-B	CHILL -4C	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl N Howald IV, Carl N Howald IV, and Greg Scanlan, Gregory_A_Scanlan@fi.gov set SON for email Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C							
Relinquished By Diane Turner 10/14/16 10:00	Print 10/14/16 10:00	Sign Diane Turner	Date/Time 10/14/16 10:00	Received By RELOGUES	Date/Time 10/14/16 12:00	Matrix* S = Soil SE = Sediment SO = Solid SL = Sludge WV = Water V = Vegetation VA = Vapor A = Air DS = Drum Solids	
Relinquished By 10/22/16	Print 10/22/16 1400	Sign 10/22/16 1400	Date/Time 10/22/16 1400	Received By TAMARA TASSO	Date/Time 10/22/16 10:30	Matrix* DL = Drum Liquids T = Tissue WM = Waste L = Liquid V = Vegetation VA = Vapor X = Other	
Relinquished By	Print	Sign	Date/Time	Received By	Date/Time	Matrix*	
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Disposed By Fred Rejcek 10/11/16 2100				Date/Time 10/11/16 2100			

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.



ANALYTICAL REPORT

Report Date: October 12, 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
20163064

Workorder: **34-1627930**

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

Analytical Results

Sample ID: S16T035454		Collected: 10/02/2016	
Lab ID: 1627930001		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035455		Collected: 10/02/2016	
Lab ID: 1627930002		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035456		Collected: 10/02/2016	
Lab ID: 1627930003		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035457		Collected: 10/02/2016	
Lab ID: 1627930004		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

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Environmental 

www.alsglobal.com

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ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035458		Collected: 10/02/2016		
Lab ID: 1627930005		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035459		Collected: 10/02/2016		
Lab ID: 1627930006		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035460		Collected: 10/02/2016		
Lab ID: 1627930007		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035461		Collected: 10/02/2016		
Lab ID: 1627930008		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035462		Collected: 10/02/2016		
Lab ID: 1627930009		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035463		Collected: 10/02/2016	
Lab ID: 1627930010		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035464		Collected: 10/02/2016	
Lab ID: 1627930011		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035465		Collected: 10/02/2016	
Lab ID: 1627930012		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035466		Collected: 10/02/2016	
Lab ID: 1627930013		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035467		Collected: 10/02/2016	
Lab ID: 1627930014		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035468		Collected: 10/02/2016	
Lab ID: 1627930015		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035469		Collected: 10/02/2016	
Lab ID: 1627930016		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035470		Collected: 10/02/2016	
Lab ID: 1627930017		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035471		Collected: 10/02/2016	
Lab ID: 1627930018		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035472		Collected: 10/02/2016	
Lab ID: 1627930019		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035473		Collected: 10/02/2016		
Lab ID: 1627930020		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035474		Collected: 10/02/2016		
Lab ID: 1627930021		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035475		Collected: 10/02/2016		
Lab ID: 1627930022		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
Analyzed: 10/11/2016				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035476		Collected: 10/02/2016		
Lab ID: 1627930023		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035477		Collected: 10/02/2016		
Lab ID: 1627930024		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035478		Collected: 10/02/2016	
Lab ID: 1627930025		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035479		Collected: 10/02/2016	
Lab ID: 1627930026		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035480		Collected: 10/02/2016	
Lab ID: 1627930027		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035481		Collected: 10/02/2016	
Lab ID: 1627930028		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010

Sample ID: S16T035482		Collected: 10/02/2016	
Lab ID: 1627930029		Received: 10/05/2016	
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube	
		Sampling Parameter: Air Volume Not Provided	
Analyzed: 10/11/2016			
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm) RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA 0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035483		Collected: 10/02/2016		
Lab ID: 1627930030		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035484		Collected: 10/02/2016		
Lab ID: 1627930031		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035485		Collected: 10/02/2016		
Lab ID: 1627930032		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035486		Collected: 10/02/2016		
Lab ID: 1627930033		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035487		Collected: 10/02/2016		
Lab ID: 1627930034		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035488		Collected: 10/02/2016		
Lab ID: 1627930035		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035489		Collected: 10/02/2016		
Lab ID: 1627930036		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m ³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035490		Collected: 10/02/2016		
Lab ID: 1627930037		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035491		Collected: 10/02/2016		
Lab ID: 1627930038		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

Sample ID: S16T035492		Collected: 10/02/2016		
Lab ID: 1627930039		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Sampling Parameter: Air Volume Not Provided		
		Analyzed: 10/11/2016		
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010



ANALYTICAL REPORT

Workorder: **34-1627930**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035493		Collected: 10/02/2016		
Lab ID: 1627930040		Received: 10/05/2016		
Method: NIOSH 1024		Media: SKC 226-37 Sorbent Tube		
		Analyzed: 10/11/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (mg/sample)	Result (mg/m³)	Result (ppm)	RL (mg/sample)
1,3-Butadiene	<0.0010	NA	NA	0.0010

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

Method	Analyst	Peer Review
NIOSH 1024	/S/ Fred Rejali 10/11/2016 22:21	/S/ Thomas J. Masoian 10/12/2016 07:58

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: **34-1627930**

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)	DATA 1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdwl/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/insideDNR/RegulatoryWater.aspx
	Texas (TNI)	T 104704456-11-1	http://www.tceq.texas.gov/field/qalab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	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.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.

LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.

ND = Not Detected, Testing result not detected above the LOD or LOQ.

NA = Not Applicable.

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

< This testing result is less than the numerical value.

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

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: **1627930**

Limits: Historical/Performance

Basis: ALS Laboratory Group

Preparation: NA

Batch: NA

Prepared By: NA

Analysis: NIOSH 1024

Batch: IFID/7832 (HBN: 178101)

Analyzed By: Fred Rejali

Blank

MB: 521250
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521744
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521747
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521750
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521753
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

MB: 521756
Analyzed: 10/11/2016 00:00
Units: mg/sample

Analyte	Result	MDL	RL
1,3-Butadiene	ND	NA	0.00100

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521251 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521252 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0334	0.0342	97.7	78.0 117.6	0.0331	96.8	0.902	0.0 20.0	



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627930

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1024
Batch: IFID/7832 (HBN: 178101)
Analyzed By: Fred Rejali

Laboratory Control Sample - Laboratory Control Sample Duplicate

LCS: 521745 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521746 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0365	0.0342	107	78.0 117.6	0.0365	107	0.00	0.0 20.0	
LCS: 521748 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521749 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0350	0.0342	102	78.0 117.6	0.0342	100	2.31	0.0 20.0	
LCS: 521751 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521752 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0330	0.0342	96.5	78.0 117.6	0.0350	102	5.88	0.0 20.0	
LCS: 521754 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521755 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0308	0.0308	100	78.0 117.6	0.0323	105	4.82	0.0 20.0	
LCS: 521757 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample					LCSD: 521758 Analyzed: 10/11/2016 00:00 Dilution: 1 Units: mg/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
1,3-Butadiene	0.0304	0.0308	98.8	78.0 117.6	0.0312	101	2.53	0.0 20.0	

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

Analyst	Peer Review
/S/ Fred Rejali 10/11/2016 22:21	/S/ Thomas J. Masoian 10/12/2016 07:58

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



1627930

Assembler		1627930		1627930		C.O.C. No. 20163054		Page 1 of 4	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				Telephone No. 373-6861		MSIN T6-05 FAX 372-1378			
Collector JONES				Sample Origin		Purchase Order/Charge Code			
SAF No. N/A				Logbook/ Work Package No.		Ice Chest No.			
Project Title				Method of Shipment		Bill of Lading/Air Bill No.		Temp. ON ICE	
Shipped To (Lab)				Data Turnaround		Parts and Return No.		41402	
Protocol				10 DAYS					
N/A									
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
	S167035454	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-9-BLANK-EF-A	CHILL -4C			
	S167035455	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-10-BLANK-EF-B	CHILL -4C			
	S167035456	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-9-BLANK-IN-A	CHILL -4C			
	S167035457	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-10-BLANK-IN-B	CHILL -4C			
	S167035458	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-A-PRT-A	CHILL -4C			
	S167035459	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-A-PRT-B	CHILL -4C			
	S167035460	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-B-PRT-A	CHILL -4C			
	S167035461	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-B-PRT-B	CHILL -4C			
	S167035462	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-C-PRT-A	CHILL -4C			
	S167035463	VA 10/02/16		CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-C-PRT-B	CHILL -4C			
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)									
MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No									
SPECIAL INSTRUCTIONS									
Send Results to Carl W. Howald IV, Carl W. Howald, Inc., and Greg Scanlan, Gregory L. Scanlan@f1.gov see SON for email									
Reference Contract # 55502									
RELEASE 3									
NIOSH 1024 CHILL BELOW -4 C									
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*	
Dianna Turner	Dianna Turner	10/16	10:00	Julie Gadomski	Julie Gadomski	10/16/2016		S = Soil	DL = Drum Liquids
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	SE = Sediment	T = Tissue
WRPS	WRPS	10/16	1400	FEDEX	FEDEX			SO = Solid	W = Wipe
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	SL = Sludge	L = Liquid
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	W = Water	V = Vegetation
								Oil	VA = Vapor
								= Air	X = Other
								DS = Drum Solids	
FINAL SAMPLE DISPOSITION				Disposals Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time	
				Fred Rejz				10/11/16 2:00	

A-6003-962 (03/05)

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

Assembler		C.O.C. No.				
N/A		20163064				
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST						
Collector	Requestor	Telephone No.	FAX			
JONES	CARL HOWARD IV	373-6861	372-1878			
SAF No.	Sample Origin	Purchase Order/Charge Code				
N/A	CARTRIDGE EVALUATION	203003/C820				
Project Title	Logbook Work Package No.	Ice Chest No.	Temp.			
CARTRIDGE EVALUATION	N/A	W-75-047	ON ICE			
Shipped To (Lab)	Method of Shipment	Bill of Lading/Air Bill No.				
AUS		7723 8817 9518				
Protocol	Data Turnaround	Parts and Return No.				
N/A	10 DAYS	41403				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T035464	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-D-PRT-A	CHILL -4C
	S16T035465	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-D-PRT-B	CHILL -4C
	S16T035466	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-E-PRT-A	CHILL -4C
	S16T035467	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-E-PRT-B	CHILL -4C
	S16T035468	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-F-PRT-A	CHILL -4C
	S16T035469	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-F-PRT-B	CHILL -4C
	S16T035470	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-G-PRT-A	CHILL -4C
	S16T035471	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-G-PRT-B	CHILL -4C
	S16T035472	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-9-EF-H-PRT-A	CHILL -4C
	S16T035473	VA	10/02/16	CHARCOAL TUBE	1,3-Butadiene 16-08766-10-EF-H-PRT-B	CHILL -4C
<p>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>SPECIAL INSTRUCTIONS</p> <p>Send Results to Carl W. Howard IV, Carl W. Howard@rl.gov, and Greg Scanlan, Gregory_J_Scanlan@rl.gov see SOW for email</p> <p>Reference Contract # 55502 RELEASE 9 NIOSH 1024 CHILL BELOW -4 C</p>						
Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time
Dianne Turner	10/4/16	10:00	John Eads	10/4/16	10:00	
Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time
WRPS	10/4/16	1400	John Eads	10/5/16	10:00	
Relinquished By	Print	Sign	Received By	Print	Sign	Date/Time
<p>Matrix*</p> <p>S = Soil SE = Sediment SO = Solid SL = Sludge V = Water VA = Vapor X = Other DS = Drum Solids</p> <p>DL = Drum Liquids T = Tissue W = Wipe L = Liquid V = Vegetation VA = Vapor X = Other DS = Drum Solids</p>						
<p>Disposal Method (e.g., Return to customer, per lab procedure, used in process)</p> <p>Disposed By: Fred Rejcek</p>						Date/Time
<p>FINAL SAMPLE DISPOSITION</p>						2100

C.3.10 Pyridines



ANALYTICAL REPORT

Report Date: October 12, 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

20163060

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035314		Collected: 10/01/2016		
Lab ID: 1627928001	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035315		Collected: 10/01/2016		
Lab ID: 1627928002	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035316		Collected: 10/01/2016		
Lab ID: 1627928003	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg	Analyzed: 10/06/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

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

RIGHT SOLUTIONS. RIGHT PARTNER.



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035317		Collected: 10/01/2016		
Lab ID: 1627928004		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035318		Collected: 10/01/2016		
Lab ID: 1627928005		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035319		Collected: 10/01/2016		
Lab ID: 1627928006		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035320		Collected: 10/01/2016		
Lab ID: 1627928007		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: 34-1627928

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035321		Collected: 10/01/2016		
Lab ID: 1627928008		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035322		Collected: 10/01/2016		
Lab ID: 1627928009		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035323		Collected: 10/01/2016		
Lab ID: 1627928010		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035324		Collected: 10/01/2016		
Lab ID: 1627928011		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035325		Collected: 10/01/2016		
Lab ID: 1627928012		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035326		Collected: 10/01/2016		
Lab ID: 1627928013		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035327		Collected: 10/01/2016		
Lab ID: 1627928014		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035328		Collected: 10/01/2016		
Lab ID: 1627928015		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: 34-1627928

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035329		Collected: 10/01/2016		
Lab ID: 1627928016		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035330		Collected: 10/01/2016		
Lab ID: 1627928017		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035331		Collected: 10/01/2016		
Lab ID: 1627928018		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035332		Collected: 10/01/2016		
Lab ID: 1627928019		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035333		Collected: 10/01/2016		
Lab ID: 1627928020		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035334		Collected: 10/02/2016		
Lab ID: 1627928021		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035335		Collected: 10/02/2016		
Lab ID: 1627928022		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035336		Collected: 10/02/2016		
Lab ID: 1627928023		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/06/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035337		Collected: 10/02/2016		
Lab ID: 1627928024		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035338		Collected: 10/02/2016		
Lab ID: 1627928025		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035339		Collected: 10/02/2016		
Lab ID: 1627928026		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035340		Collected: 10/02/2016		
Lab ID: 1627928027		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035341		Collected: 10/02/2016		
Lab ID: 1627928028		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035342		Collected: 10/02/2016		
Lab ID: 1627928029		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035343		Collected: 10/02/2016		
Lab ID: 1627928030		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035344		Collected: 10/02/2016		
Lab ID: 1627928031		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035345		Collected: 10/02/2016		
Lab ID: 1627928032		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035346		Collected: 10/02/2016		
Lab ID: 1627928033	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035347		Collected: 10/02/2016		
Lab ID: 1627928034		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/07/2016
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035348		Collected: 10/02/2016		
Lab ID: 1627928035		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Analyzed: 10/07/2016		
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035349		Collected: 10/02/2016		
Lab ID: 1627928036		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035350		Collected: 10/02/2016		
Lab ID: 1627928037		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035351		Collected: 10/02/2016		
Lab ID: 1627928038		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Sample ID: S16T035352		Collected: 10/02/2016		
Lab ID: 1627928039		Received: 10/05/2016		
Method: NIOSH 1613 Mod.		Media: SKC 226-01, Charcoal Tube 100/50mg		
		Sampling Parameter: Air Volume Not Provided		
Analyte	Result (ug/sample)	Result (mg/m ³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50



ANALYTICAL REPORT

Workorder: **34-1627928**

Client Project ID: CARTRIDGE EVALUATION

Purchase Order: 55502 Rel9

Project Manager: Rand Potter

Analytical Results

Sample ID: S16T035353		Collected: 10/02/2016		
Lab ID: 1627928040	Sampling Location: CARTRIDGE EVALUATION		Received: 10/05/2016	
Method: NIOSH 1613 Mod.	Media: SKC 226-01, Charcoal Tube 100/50mg		Analyzed: 10/07/2016	
Sampling Parameter: Air Volume Not Provided				
Analyte	Result (ug/sample)	Result (mg/m³)	Result (ppm)	RL (ug/sample)
Pyridine	<0.50	NA	NA	0.50
2,4-Dimethylpyridine	<0.50	NA	NA	0.50

Comments

Quality Control: **NIOSH 1613 Mod. - (HBN: 177979)**

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.

Quality Control: **NIOSH 1613 Mod. - (HBN: 177980)**

The LCS was non-detect for the target analytes and the LCSD was spiked with double the target analytes. NC/CAR #1203 was initiated to investigate the issue.

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.

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

Method	Analyst	Peer Review
NIOSH 1613 Mod.	/S/ David Teynor 10/11/2016 08:55	/S/ Thomas J. Masoian 10/12/2016 08:06

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.alslsc.com



ANALYTICAL REPORT

Workorder: **34-1627928**
Client Project ID: CARTRIDGE EVALUATION
Purchase Order: 55502 Rel9
Project Manager: Rand Potter

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	ANAB (DoD ELAP)	ADE-1420	http://www.anab.org/accredited-organizations/
	Utah (NELAC)	DATA1	http://health.utah.gov/lab/labimp/
	Nevada	UT00009	http://ndep.nv.gov/bsdw/labservice.htm
	Oklahoma	UT00009	http://www.deq.state.ok.us/CSDnew/
	Iowa	IA# 376	http://www.iowadnr.gov/InsideDNR/RegulatoryWater.aspx
	Texas (TNI)	T104704456-11-1	http://www.tceq.texas.gov/field/qa/lab_accred_certif.html
	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
Industrial Hygiene	Kansas	E-10416	http://www.kdheks.gov/lipo/index.html
	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
Lead Testing: CPSC Soil, Dust, Paint, Air	Washington	C596-16	http://www.ecy.wa.gov/programs/eap/labs/index.html
	ANAB (ISO 17025, CPSC)	ADE-1420	http://www.anab.org/accredited-organizations/
Dietary Supplements	AIHA LAP LLC (ISO 17025 & IHLAP/ELLAP)	101574	http://www.aihaaccreditedlabs.org
	ACLASS (ISO 17025)	ADE-1420	http://www.aiclasscorp.com

Definitions

LOD = Limit of Detection = MDL = Method Detection Limit, A statistical estimate of method/media/instrument sensitivity.
LOQ = Limit of Quantitation = RL = Reporting Limit, A verified value of method/media/instrument sensitivity.
ND = Not Detected, Testing result not detected above the LOD or LOQ.
NA = Not Applicable.
** No result could be reported, see sample comments for details.
< This testing result is less than the numerical value.
() This testing result is between the LOD and LOQ and has higher analytical uncertainty than values at or above the LOQ.

ALS Environmental certifies this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this report has been electronically authorized by the following laboratory representative:

Rand Potter, Project Manager, ALS Environmental



Quality Control Sample Batch Report

Analysis Information

Workorder: 1627928

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: ISVO/3170 (HBN: 177979)
Analyzed By: David Teynor

Blank

LMB: 521507 Analyzed: 10/06/2016 15:49 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: 521508 Analyzed: 10/06/2016 16:07 Dilution: 1 Units: ug/sample					LCSD: 521509 Analyzed: 10/06/2016 16:25 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	1.61	2.00	80.3	61.8 141.1	1.50	74.8	7.19	0.0	22.1
2,4-Dimethylpyridine	1.62	2.00	81.2	51.7 130.6	1.41	70.3	14.4	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.

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

Analyst	Peer Review
/S/ David Teynor 10/11/2016 08:35	/S/ Thomas J. Masoian 10/11/2016 15:23

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: 1627928

Limits: Historical/Performance
Basis: ALS Laboratory Group

Preparation: NA
Batch: NA
Prepared By: NA

Analysis: NIOSH 1613 Mod.
Batch: ISVO/3171 (HBN: 177980)
Analyzed By: David Teynor

Blank

LMB: 521510 Analyzed: 10/06/2016 16:33 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: 521511 Analyzed: 10/06/2016 16:53 Dilution: 1 Units: ug/sample					LCSD: 521512 Analyzed: 10/06/2016 17:13 Dilution: 1 Units: ug/sample				
Analyte	Result	Target	% Rec	QC Limits	Result	% Rec	RPD	QC Limits	
Pyridine	0.00	2.00	* 0.00	61.8 141.1	3.05	76.4 *	200	0.0 22.1	
2,4-Dimethylpyridine	0.00	2.00	* 0.00	51.7 130.6	2.43	60.7 *	200	0.0 22.2	

Comments

The LCS was non-detect for the target analytes and the LCSD was spiked with double the target analytes. NC/CAR #1203 was initiated to investigate the issue.

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.

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

Analyst	Peer Review
/S/ David Teynor 10/11/2016 08:55	/S/ Thomas J. Masoian 10/12/2016 08:06

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



1627928

1627928

Assembler N/A		C.O.C. No. 20163060		Page 1 of 4	
Collector JONES		Telephone No. 373-6861		MSIN 76-05 FAX 372-1878	
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION		Purchase Order/Charge Code 735037630	
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A		Ice Chest No. 645-047	
Shipped To (Lab) ALS		Method of Shipment		Temp. 00 ICE	
Protocol N/A		Data Turnaround 10 DAYS		Bill of Lading/Air Bill No. 773 8817 9518	
		Parts and Return No. 41402			

Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative
	S16T035314	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-BASE-EFF	N/A
	S16T035315	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-BASE-IN	N/A
	S16T035316	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-BLANK1	N/A
	S16T035317	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-BLANK2	N/A
	S16T035318	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-A	N/A
	S16T035319	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-B	N/A
	S16T035320	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-C	N/A
	S16T035321	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-D	N/A
	S16T035322	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-E	N/A
	S16T035323	VA 10/01/16	CHARCOAL TUBE	Pyridines 16-08765-11-EFF-F	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Scanlan Carl W Howald@rl.gov and Gregory J Scanlan@rl.gov see SON for email RELEASE 9 Reference Contract # 55502		Hold Time Date/Time
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Relinquished By TEREESA ROBERTS Signature Date/Time 10/14/16 1000	Received By Julie Gradish Signature Date/Time 10/14/16 1000	Date/Time 10/14/16 1000
Relinquished By WRPS Signature Date/Time 10/14/16 1400	Received By Julie Gradish Signature Date/Time 10/14/16 1400	Date/Time 10/14/16 1400
Relinquished By Signature Date/Time 10/14/16 1400	Received By Julie Gradish Signature Date/Time 10/14/16 1400	Date/Time 10/14/16 1400

Disposal Method (e.g., Return to customer, per lab procedure, used in process) Per Lab Procedure	Disposed By Julie Gradish	Date/Time 10/16/16 14:00
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A-6003-962 (03/05)

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CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST									
Assembler N/A		C.O.C. No. 20163060 Page 3 of 4							
Collector JONES		Contact/Requestor CARL HOWARD IV		Telephone No. 373-4861		FAX 372-1878			
SAF No. N/A		Sample Origin CHARLOTTE EVALUATION		Purchase Order/Charge Code 203033/0250					
Project Title CHARLOTTE EVALUATION		Logbook/ Work Package No. N/A		Ice Chest No. WFS-047		Temp. ON ICE			
Shipped To (Lab) ALS		Method of Shipment		Bill of Lading/Air Bill No. 7733 8817 9518					
Protocol N/A		Data Turnaround 10 days		Parts and Return No. 414902					
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative			
S16T035334	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BASE-ZFF	N/A			
S16T035335	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BASE-IN	N/A			
S16T035336	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BLANK-EFF	N/A			
S16T035337	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BLANK-IN	N/A			
S16T035338	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-A	N/A			
S16T035339	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-B	N/A			
S16T035340	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-C	N/A			
S16T035341	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-D	N/A			
S16T035342	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-E	N/A			
S16T035343	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-EFF-F	N/A			
<p>POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No</p> <p>SPECIAL INSTRUCTIONS Send Results to Carl Howard IV and Greg Scanlan Carl@howardiv.com and gregory_p_scanlan@fbi.gov see SOW for email</p> <p>REFERENCE # 55502</p>									
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Method	
TERESA FORRESTER	TERESA FORRESTER	TERESA FORRESTER	10-4-16 1000	Julius Graham	Julius Graham	Julius Graham	10/4/16 1000	S = Soil SE = Sediment SO = Solid SL = Sludge W = Water VA = Vapor DS = Drum Solids	DL = Drum Liquids T = Tissue WM = Waste L = Liquid V = Vegetation X = Other
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time		
WRPS	WRPS	WRPS	10-4-16 1400	Julius Graham	Julius Graham	Julius Graham	10-4-16 1400		
Relinquished By	Print	Sign	Date/Time	Received By	Print	Sign	Date/Time		
FINAL SAMPLE DISPOSITION		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time			
		Per Lab Procedure		Dylan Baum		10/06/16 14:00			

A-6003-952 (03/05)

Page

Assembler		C.O.C. No. 20163060				
N/A		Page 4 of 4				
Collector		Telephone No. 373-6861				
N/A		MSIN 16-05 FAX 372-1878				
Sample No.		Purchase Order/Charge Code				
N/A		203003/020				
Project Title		Ice Chest No. 610 ICE				
N/A		Bill of Lading/Air Bill No. 773 8817 9518				
Shipped To (Lab)		Paits and Return No. 41402				
N/A						
Protocol		Data Turnaround				
N/A		10 DAYS				
Sample No.	Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
S167035344	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BFF-G	N/A
S167035345	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-BFF-H	N/A
S167035346	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-A	N/A
S167035347	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-B	N/A
S167035348	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-C	N/A
S167035349	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-D	N/A
S167035350	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-E	N/A
S167035351	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-F	N/A
S167035352	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-G	N/A
S167035353	VA	10/02/16		CHARCOAL TUBE	Pyridines 16-08766-11-IN-H	N/A
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No SPECIAL INSTRUCTIONS Send Results to Carl Howald IV and Greg Scanlan Carl Howald IV: cscanlan@1.gov and Greg Scanlan: gscanlan@1.gov see SCW for email Reference Contract # 55502						
Relinquished By	Print	Signature	Date/Time	Received By	Print	Date/Time
TEESA FORRESTER	10/4/16	10:00	10/4/16	10:00	10/4/16	10:00
Relinquished By	Print	Signature	Date/Time	Received By	Print	Date/Time
JA Grady	10/4/16	1400	10/4/16	1400	10/4/16	1400
Relinquished By	Print	Signature	Date/Time	Received By	Print	Date/Time
WRPS	10/4/16	1400	10/4/16	1400	10/4/16	1400
Relinquished By	Print	Signature	Date/Time	Received By	Print	Date/Time
WRPS	10/4/16	1400	10/4/16	1400	10/4/16	1400
Matrix S = Soil SE = Sediment SO = Solid SL = Sludge W = Water O = Oil A = Air DS = Drum Solids DL = Drum Liquids T = Tissue WM = Wipe L = Liquid V = Vegetation VA = Vapor X = Other						
FINAL SAMPLE DISPOSITION Disposal Method (e.g., Return to customer, per lab procedure, used in process) Per Lab Procedure Disposed By: Ryan Baum Date/Time: 10/06/16 14:06 A-6003-962 (03/05)						

C.3.11 Nitrosamines

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Carl Howald IV

11/22/16

Washington River Protection Solutions, LLC
P.O. Box 850 MSIN H6-16
Richland, WA 99352

Contract No.: 55503 R5

Project: Cartridge Evaluation

Subject: Nitrosamines Analysis Report, Group Number 20163073

Enclosed is the final report for group 20163073 number analyzed for Nitrosamines using NIOSH 2522-Modified. This group number 20163073 has been assigned a Columbia Basin Analytical Laboratories login order number of W610006. 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 10/04/16 to be tested for Nitrosamines. The samples were analyzed in accordance with NIOSH 2522-Modified for N-Nitrosodimethylamine, N-Nitrosomethylethylamine, N-Nitrosodiethylamine, N-Nitrosodi-n-propylamine, N-Nitrosodi-n-butylamine, N-Nitrosopiperidine, N-Nitrosopyrrolidine, and N-Nitrosomorpholine. All results have been corrected for desorption efficiency and measurable levels in the blanks.

* Analyte not detected at or above MRL on initial analysis. Analyte detected at or above MRL on confirmation analysis. Analyte not confirmed.

X- Analyte detected at or above MRL on initial analysis. Analyte not detected at or above MRL on confirmation analysis. Analyte not confirmed.

C- Analyte detected at or above MRL on initial analysis and confirmation analysis. Poor mass agreement between initial and confirmation analysis indicates interference such that this result should be considered qualitative only.

Results

There were detectable nitrosamines concentrations at or above the reporting limit in the samples.

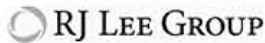
SampleName	Lab ID	Analyzed	Analyte	Results	RL	Units	Flags
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-BASE-EFF	S16T035597	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	

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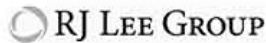
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-BASE-IN	S16T035600	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-BLANK1	S16T035601	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-BLANK2	S16T035602	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-EFF-A	S16T035603	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-EFF-B	S16T035605	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube
16-08765-12-EFF-C	S16T035606	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube

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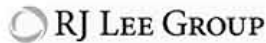
16-08765-12-EFF-D	S16T035607	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-EFF-E	S16T035608	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-EFF-F	S16T035609	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-EFF-G	S16T035610	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosomorpholine	<0.022	0.022	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-EFF-H	S16T035611	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodiethylamine	0.041	0.023	µg/tube	X
16-08765-12-IN-A	S16T035612	10/24/16	N-Nitrosodimethylamine	5.917	1.125	µg/tube	D
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosomethylethylamine	0.184	0.023	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosomorpholine	0.052	0.022	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-A	S16T035612	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodiethylamine	0.056	0.023	µg/tube	X
16-08765-12-IN-B	S16T035613	10/25/16	N-Nitrosodimethylamine	8.341	1.125	µg/tube	D
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	*
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosomethylethylamine	0.249	0.023	µg/tube	
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosomorpholine	0.195	0.022	µg/tube	
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-B	S16T035613	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodiethylamine	0.049	0.023	µg/tube	X
16-08765-12-IN-C	S16T035614	10/24/16	N-Nitrosodimethylamine	9.508	1.125	µg/tube	D
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	*
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosomethylethylamine	0.225	0.023	µg/tube	

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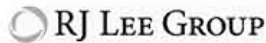
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosomorpholine	0.214	0.022	µg/tube	
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-C	S16T035614	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-D	S16T035615	10/25/16	N-Nitrosodimethylamine	8.103	1.125	µg/tube	D
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosomethylethylamine	0.199	0.023	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosomorpholine	0.193	0.022	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-D	S16T035615	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-E	S16T035616	10/25/16	N-Nitrosodimethylamine	9.427	1.125	µg/tube	D
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosomethylethylamine	0.245	0.023	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosomorpholine	0.192	0.022	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-E	S16T035616	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-F	S16T035617	10/24/16	N-Nitrosodimethylamine	8.288	1.125	µg/tube	D
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosomethylethylamine	0.247	0.023	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosomorpholine	0.211	0.022	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-F	S16T035617	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-G	S16T035618	10/24/16	N-Nitrosodimethylamine	1.017	0.225	µg/tube	D
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosomethylethylamine	0.030	0.023	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosomorpholine	0.047	0.022	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-G	S16T035618	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-H	S16T035619	10/24/16	N-Nitrosodimethylamine	7.652	1.125	µg/tube	D,C
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosomethylethylamine	0.200	0.023	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosomorpholine	0.075	0.022	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosopiperidine	<0.024	0.024	µg/tube	
16-08765-12-IN-H	S16T035619	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-BASE-EFF	S16T035620	10/20/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodimethylamine	0.030	0.017	µg/tube	
16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	

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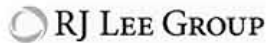
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16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-BASE-IN	S16T035621	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-BLANK-EFF	S16T035622	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-BLANK-IN	S16T035623	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-EFF-A	S16T035624	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-EFF-B	S16T035625	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-EFF-C	S16T035626	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube
16-08766-12-EFF-D	S16T035627	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube

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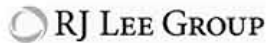
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16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-EFF-E	S16T035628	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-EFF-F	S16T035629	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-EFF-G	S16T035630	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-EFF-H	S16T035631	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosodiethylamine	0.066	0.024	µg/tube	X
16-08766-12-IN-A	S16T035632	10/25/16	N-Nitrosodimethylamine	5.750	1.064	µg/tube	D,C
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosomethylethylamine	0.151	0.024	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosomorpholine	0.058	0.023	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-A	S16T035632	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-B	S16T035633	10/25/16	N-Nitrosodimethylamine	7.436	1.064	µg/tube	D,C
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosomethylethylamine	0.244	0.024	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosomorpholine	0.178	0.023	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-B	S16T035633	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosodiethylamine	0.067	0.024	µg/tube	X
16-08766-12-IN-C	S16T035634	10/25/16	N-Nitrosodimethylamine	9.241	1.064	µg/tube	D
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosomethylethylamine	0.259	0.024	µg/tube	
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosomorpholine	0.203	0.023	µg/tube	
16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	

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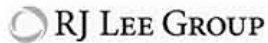
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16-08766-12-IN-C	S16T035634	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-D	S16T035635	10/25/16	N-Nitrosodimethylamine	7.547	1.064	µg/tube	D,C
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosomethylethylamine	0.223	0.024	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosomorpholine	0.155	0.023	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-D	S16T035635	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-E	S16T035636	10/25/16	N-Nitrosodimethylamine	5.822	1.064	µg/tube	D
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosomethylethylamine	0.174	0.024	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosomorpholine	0.055	0.023	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-E	S16T035636	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-F	S16T035638	10/25/16	N-Nitrosodimethylamine	5.993	1.064	µg/tube	D,C
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosomethylethylamine	0.180	0.024	µg/tube	
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosomorpholine	0.030	0.023	µg/tube	C
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-F	S16T035638	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-G	S16T035640	10/25/16	N-Nitrosodimethylamine	6.786	1.064	µg/tube	D, C
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosomethylethylamine	0.190	0.024	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosomorpholine	0.026	0.023	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-G	S16T035640	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-H	S16T035641	10/25/16	N-Nitrosodimethylamine	4.451	1.064	µg/tube	D,C
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosomethylethylamine	0.185	0.024	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosomorpholine	<0.023	0.023	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosopiperidine	<0.023	0.023	µg/tube	
16-08766-12-IN-H	S16T035641	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	µg/tube	

**Recovery Failures in the ICV, CCVs, LCSs, RL and MRL**

There were no recovery failures in the CCVs, ICV, LCSs, MRL.

RSD Failures in the LCSs

There were no RSD failures between the laboratory control samples.

Measurable Blank Values

There were no measurable analytes in the blank samples.

Calibration Curves

The calibration curves for the Nitrosamines had an R-value that was 0.997 or better, over a range of 5.0 ng/mL to 200 ng/mL.

General Lab Comments

The results provided in this report relate only to the items tested. Samples were received in acceptable conditions unless otherwise noted in the comments above. Samples have not been field blank corrected unless otherwise noted in the general set comments above. This test report shall not be reproduced, except in full, without written approval of Columbia Basin Analytical Laboratories.

I certify that this analytical report is in compliance with the Hanford SOW, both technically and for completeness. Release of the data contained in this hard copy report has been authorized by the Laboratory Director or a designee as verified by the following signature.

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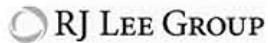
Scientist II DeNomy Dage

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:

11/22/16

Scientist I Fernanda Pincheira



Carl Howald IV
 Washington River Protection
 Solutions, LLC
 P.O. Box 850 MSIN H6-16
 Richland, WA 99352
 Client Project:
 Cartridge Evaluation

Laboratory Report
 NIOSH 2522
 Air/Emissions on GC/TEA Analyzer
 Summary Table

RJ Lee Group No.: W610006
 Samples Received: 10/04/16
 Report Date: 11/22/16
 COC No.: 20163073
 Extraction Date: 10/12/16

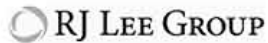
Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08765-12-BASE-EFF | S16T035597	W610006-01	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-BASE-IN | S16T035600	W610006-02	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosopyrrolidine	<0.023	0.023	

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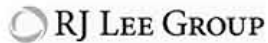
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16-08765-12-BLANK1 S16T035601	W610006-03	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-BLANK2 | S16T035602	W610006-04	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-A | S16T035603	W610006-05	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	

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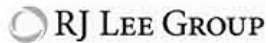
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16-08765-12-EFF-B S16T035605	W610006-06	10/01/16	10/19/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/19/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/19/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/19/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/19/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-C | S16T035606	W610006-07	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
16-08765-12-EFF-D | S16T035607	W610006-08	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	

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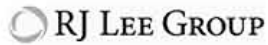
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16-08765-12-EFF-E S16T035608	W610006-09	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-EFF-F | S16T035609	W610006-10	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-EFF-G | S16T035610	W610006-11	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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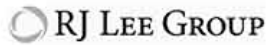
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16-08765-12-EFF-H S16T035611	W610006-12	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodimethylamine	<0.025	0.025	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	<0.022	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-IN-A | S16T035612	W610006-13	10/01/16	10/20/16	N-Nitrosodiethylamine	0.041	0.023	X
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.164	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	5.754	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.184	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.052	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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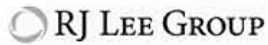
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		10/01/16	10/24/16	N-Nitrosodimethylamine	8.141	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.200	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	*
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.249	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.195	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-IN-C | S16T035614	W610006-15	10/01/16	10/20/16	N-Nitrosodiethylamine	0.049	0.023	X
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.754	0.230	D
		10/01/16	10/24/16	N-Nitrosodimethylamine	8.753	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	*
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.225	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.214	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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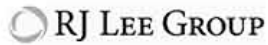
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		10/01/16	10/24/16	N-Nitrosodimethylamine	7.252	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.035	0.025	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.816	0.230	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.199	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.193	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-IN-E | S16T035616	W610006-17	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	9.081	1.12	D
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.346	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.245	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.192	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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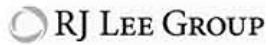
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		10/01/16	10/25/16	N-Nitrosodimethylamine	0.306	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	7.982	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.247	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.211	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08765-12-IN-G | S16T035618	W610006-19	10/01/16	10/20/16	N-Nitrosodiethylamine	<0.023	0.023	
		10/01/16	10/25/16	N-Nitrosodimethylamine	0.036	0.023	
		10/01/16	10/24/16	N-Nitrosodimethylamine	0.982	0.225	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.030	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.047	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	

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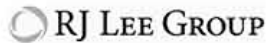
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		10/01/16	10/25/16	N-Nitrosodimethylamine	0.152	0.023	C
		10/01/16	10/24/16	N-Nitrosodimethylamine	7.499	1.12	D
		10/01/16	10/20/16	N-Nitrosodi-n-butylamine	<0.023	0.023	
		10/01/16	10/20/16	N-Nitrosodi-n-propylamine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosomethylethylamine	0.200	0.023	
		10/01/16	10/20/16	N-Nitrosomorpholine	0.075	0.022	
		10/01/16	10/20/16	N-Nitrosopiperidine	<0.024	0.024	
		10/01/16	10/20/16	N-Nitrosopyrrolidine	<0.023	0.023	
16-08766-12-BASE-EFF | S16T035620	W610006-21	10/02/16	10/20/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/20/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/20/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/20/16	N-Nitrosopyrrolidine	<0.024	0.024	

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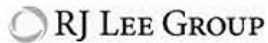
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		10/02/16	10/21/16	N-Nitrosodimethylamine	0.030	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-BLANK-EFF | S16T035622	W610006-23	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-BLANK-IN | S16T035623	W610006-24	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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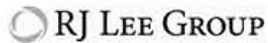
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		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-EFF-B | S16T035625	W610006-26	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-EFF-C | S16T035626	W610006-27	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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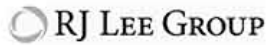
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		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-E | S16T035628	W610006-29	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
16-08766-12-EFF-F | S16T035629	W610006-30	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	

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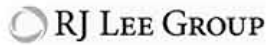
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		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-EFF-H | S16T035631	W610006-32	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodimethylamine	<0.017	0.017	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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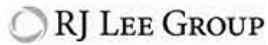
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		10/02/16	10/25/16	N-Nitrosodimethylamine	5.704	1.06	D
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.046	0.023	C
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.151	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.058	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-B | S16T035633	W610006-34	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.129	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	7.307	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.244	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.178	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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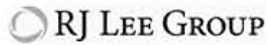
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		10/02/16	10/25/16	N-Nitrosodimethylamine	0.225	0.023	
		10/02/16	10/25/16	N-Nitrosodimethylamine	9.016	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.259	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.203	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-D | S16T035635	W610006-36	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.348	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	7.199	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.223	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.155	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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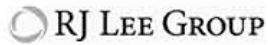
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		10/02/16	10/25/16	N-Nitrosodimethylamine	0.190	0.023	
		10/02/16	10/25/16	N-Nitrosodimethylamine	5.632	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.174	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.055	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-F | S16T035638	W610006-38	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.304	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.026	0.025	
		10/02/16	10/25/16	N-Nitrosodimethylamine	5.663	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.180	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.030	0.023	C
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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Sample Identification Client Sample ID	RJLG ID	Sampling Date	Analysis Date	Analyte	Concentration µg/tube	RL	Qualifiers
16-08766-12-IN-G | S16T035640	W610006-39	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	6.599	1.06	D, C
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.187	0.023	
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.190	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	0.026	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	
16-08766-12-IN-H | S16T035641	W610006-40	10/02/16	10/21/16	N-Nitrosodiethylamine	<0.024	0.024	
		10/02/16	10/25/16	N-Nitrosodimethylamine	0.154	0.023	C
		10/02/16	10/25/16	N-Nitrosodimethylamine	4.297	1.06	D
		10/02/16	10/21/16	N-Nitrosodi-n-butylamine	<0.024	0.024	
		10/02/16	10/21/16	N-Nitrosodi-n-propylamine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosomethylethylamine	0.185	0.024	
		10/02/16	10/21/16	N-Nitrosomorpholine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopiperidine	<0.023	0.023	
		10/02/16	10/21/16	N-Nitrosopyrrolidine	<0.024	0.024	

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**Report Qualifiers:**

A = Target Analyte media breakthrough suspect, see analytical report

D = Analyte analyzed in a dilution

E = Report concentration was above the instrument calibration range

J = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, rsl >90% w RT match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

H = Holding times for preparation or analysis exceeded

L = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

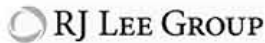
S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

ND = Not Detected

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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

Quality Control

NIOSH 2522

RJ Lee Group No.: W610006
Samples Received: 10/04/16
Report Date: 11/22/16
COC No.: 20163073
Extraction Date: 10/24/16

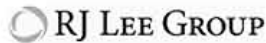
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodiethylamine	55-18-5	BLK	10/24/16		0.00	0.96	0.00			
N-Nitrosodimethylamine	62-75-9	BLK	10/24/16		0.00	0.89	0.00			
N-Nitrosodi-n-butylamine	924-16-3	BLK	10/24/16		0.00	0.99	0.00			
N-Nitrosodi-n-propylamine	621-64-7	BLK	10/24/16		0.00	0.98	0.00			
N-Nitrosomethylethylamine	10595-95-6	BLK	10/24/16		0.00	0.94	0.00			
N-Nitrosomorpholine	59-89-2	BLK	10/24/16		0.00	0.97	0.00			
N-Nitrosopiperidine	100-75-4	BLK	10/24/16		0.00	0.97	0.00			
N-Nitrosopyrrolidine	930-55-2	BLK	10/24/16		0.00	0.93	0.00			
N-Nitrosodiethylamine	55-18-5	BLK1	10/24/16		0.00	0.99	0.00			
N-Nitrosodimethylamine	62-75-9	BLK1	10/24/16		0.00	0.94	0.00			
N-Nitrosodi-n-butylamine	924-16-3	BLK1	10/24/16		0.00	1.03	0.00			
N-Nitrosodi-n-propylamine	621-64-7	BLK1	10/24/16		0.00	1.02	0.00			
N-Nitrosomethylethylamine	10595-95-6	BLK1	10/24/16		0.00	0.98	0.00			
N-Nitrosomorpholine	59-89-2	BLK1	10/24/16		0.00	1.02	0.00			
N-Nitrosopiperidine	100-75-4	BLK1	10/24/16		0.00	1.00	0.00			
N-Nitrosopyrrolidine	930-55-2	BLK1	10/24/16		0.00	0.99	0.00			
N-Nitrosodiethylamine	55-18-5	LCS-1	10/19/16	0.200	0.173	0.85	0.203	101	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/20/16	0.200	0.175	0.84	0.207	103	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/25/16	0.200	0.178	0.91	0.196	97.8	2.62	
N-Nitrosodiethylamine	55-18-5	LCS-1	10/25/16	0.200	0.174	0.84	0.207	104	5.11	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/19/16	0.200	0.164	0.79	0.206	103	6.51	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/20/16	0.200	0.172	0.84	0.204	102	2.29	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/25/16	0.200	0.173	0.87	0.199	99.6	1.54	
N-Nitrosodimethylamine	62-75-9	LCS-1	10/25/16	0.200	0.170	0.81	0.210	105	4.86	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/19/16	0.200	0.173	0.85	0.202	101	1.50	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/20/16	0.200	0.170	0.85	0.201	100	1.13	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/25/16	0.200	0.175	0.92	0.190	95.3	4.06	
N-Nitrosodi-n-butylamine	924-16-3	LCS-1	10/25/16	0.200	0.180	0.88	0.204	102	3.26	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/19/16	0.200	0.173	0.84	0.206	103	4.33	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/20/16	0.200	0.176	0.86	0.204	102	2.12	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/25/16	0.200	0.180	0.92	0.195	97.6	2.15	
N-Nitrosodi-n-propylamine	621-64-7	LCS-1	10/25/16	0.200	0.178	0.87	0.204	102	1.89	

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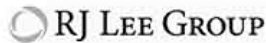
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/19/16	0.200	0.179	0.86	0.207	104	5.40	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/20/16	0.200	0.173	0.85	0.204	102	2.14	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/25/16	0.200	0.177	0.90	0.197	97.9	2.22	
N-Nitrosomethylethylamine	10595-95-6	LCS-1	10/25/16	0.200	0.173	0.83	0.209	104	4.97	
N-Nitrosomorpholine	59-89-2	LCS-1	10/19/16	0.200	0.190	0.92	0.207	103	4.29	
N-Nitrosomorpholine	59-89-2	LCS-1	10/20/16	0.200	0.174	0.86	0.203	101	1.35	
N-Nitrosomorpholine	59-89-2	LCS-1	10/25/16	0.200	0.181	0.92	0.197	98.1	3.50	
N-Nitrosomorpholine	59-89-2	LCS-1	10/25/16	0.200	0.179	0.87	0.207	103	3.52	
N-Nitrosopiperidine	100-75-4	LCS-1	10/19/16	0.200	0.172	0.84	0.205	103	4.54	
N-Nitrosopiperidine	100-75-4	LCS-1	10/20/16	0.200	0.174	0.86	0.203	102	2.11	
N-Nitrosopiperidine	100-75-4	LCS-1	10/25/16	0.200	0.179	0.91	0.197	98.1	1.71	
N-Nitrosopiperidine	100-75-4	LCS-1	10/25/16	0.200	0.181	0.86	0.211	105	4.92	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/19/16	0.200	0.179	0.87	0.206	103	4.82	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/20/16	0.200	0.173	0.85	0.204	102	2.21	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/25/16	0.200	0.177	0.90	0.197	98.5	2.74	
N-Nitrosopyrrolidine	930-55-2	LCS-1	10/25/16	0.200	0.179	0.85	0.210	105	4.83	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/19/16	0.200	0.164	0.85	0.193	96.3	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/20/16	0.200	0.169	0.84	0.200	99.8	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/25/16	0.200	0.180	0.91	0.199	99.3	2.62	
N-Nitrosodiethylamine	55-18-5	LCS-2	10/25/16	0.200	0.158	0.84	0.188	94.2	5.11	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/19/16	0.200	0.147	0.79	0.185	92.5	6.51	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/20/16	0.200	0.170	0.84	0.201	101	2.29	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/25/16	0.200	0.172	0.87	0.198	98.7	1.54	
N-Nitrosodimethylamine	62-75-9	LCS-2	10/25/16	0.200	0.154	0.81	0.190	95.2	4.86	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/19/16	0.200	0.168	0.85	0.197	98.4	1.50	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/20/16	0.200	0.171	0.85	0.202	101	1.13	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/25/16	0.200	0.189	0.92	0.206	102	4.06	
N-Nitrosodi-n-butylamine	924-16-3	LCS-2	10/25/16	0.200	0.170	0.88	0.193	96.2	3.26	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/19/16	0.200	0.160	0.84	0.191	95.0	4.33	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/20/16	0.200	0.174	0.86	0.202	100	2.12	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/25/16	0.200	0.186	0.92	0.202	101	2.15	
N-Nitrosodi-n-propylamine	621-64-7	LCS-2	10/25/16	0.200	0.172	0.87	0.198	98.9	1.89	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/19/16	0.200	0.162	0.86	0.188	93.8	5.40	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/20/16	0.200	0.170	0.85	0.201	99.9	2.14	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/25/16	0.200	0.180	0.90	0.200	99.7	2.22	
N-Nitrosomethylethylamine	10595-95-6	LCS-2	10/25/16	0.200	0.157	0.83	0.189	94.7	4.97	
N-Nitrosomorpholine	59-89-2	LCS-2	10/19/16	0.200	0.175	0.92	0.190	95.1	4.29	
N-Nitrosomorpholine	59-89-2	LCS-2	10/20/16	0.200	0.171	0.86	0.200	99.9	1.35	
N-Nitrosomorpholine	59-89-2	LCS-2	10/25/16	0.200	0.180	0.92	0.196	97.9	3.50	

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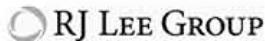
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosomorpholine	59-89-2	LCS-2	10/25/16	0.200	0.167	0.87	0.193	96.4	3.52	
N-Nitrosopiperidine	100-75-4	LCS-2	10/19/16	0.200	0.159	0.84	0.190	94.8	4.54	
N-Nitrosopiperidine	100-75-4	LCS-2	10/20/16	0.200	0.172	0.86	0.201	101	2.11	
N-Nitrosopiperidine	100-75-4	LCS-2	10/25/16	0.200	0.183	0.91	0.201	100	1.71	
N-Nitrosopiperidine	100-75-4	LCS-2	10/25/16	0.200	0.165	0.86	0.192	95.9	4.92	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/19/16	0.200	0.164	0.87	0.189	94.5	4.82	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/20/16	0.200	0.171	0.85	0.202	101	2.21	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/25/16	0.200	0.177	0.90	0.197	98.3	2.74	
N-Nitrosopyrrolidine	930-55-2	LCS-2	10/25/16	0.200	0.162	0.85	0.190	95.0	4.83	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/19/16	0.200	0.175	0.85	0.205	102	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/20/16	0.200	0.164	0.84	0.194	96.9	3.21	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/25/16	0.200	0.187	0.91	0.206	103	2.62	
N-Nitrosodiethylamine	55-18-5	LCS-3	10/25/16	0.200	0.172	0.84	0.205	102	5.11	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/19/16	0.200	0.166	0.79	0.209	104	6.51	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/20/16	0.200	0.165	0.84	0.195	97.4	2.29	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/25/16	0.200	0.177	0.87	0.204	102	1.54	
N-Nitrosodimethylamine	62-75-9	LCS-3	10/25/16	0.200	0.162	0.81	0.200	99.8	4.86	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/19/16	0.200	0.172	0.85	0.201	100	1.50	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/20/16	0.200	0.167	0.85	0.197	98.7	1.13	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/25/16	0.200	0.188	0.92	0.205	102	4.06	
N-Nitrosodi-n-butylamine	924-16-3	LCS-3	10/25/16	0.200	0.180	0.88	0.204	102	3.26	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/19/16	0.200	0.171	0.84	0.204	102	4.33	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/20/16	0.200	0.169	0.86	0.196	97.7	2.12	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/25/16	0.200	0.188	0.92	0.204	102	2.15	
N-Nitrosodi-n-propylamine	621-64-7	LCS-3	10/25/16	0.200	0.173	0.87	0.199	98.9	1.89	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/19/16	0.200	0.177	0.86	0.205	103	5.40	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/20/16	0.200	0.166	0.85	0.196	97.9	2.14	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/25/16	0.200	0.185	0.90	0.205	102	2.22	
N-Nitrosomethylethylamine	10595-95-6	LCS-3	10/25/16	0.200	0.167	0.83	0.202	101	4.97	
N-Nitrosomorpholine	59-89-2	LCS-3	10/19/16	0.200	0.187	0.92	0.203	102	4.29	
N-Nitrosomorpholine	59-89-2	LCS-3	10/20/16	0.200	0.169	0.86	0.197	98.7	1.35	
N-Nitrosomorpholine	59-89-2	LCS-3	10/25/16	0.200	0.192	0.92	0.209	104	3.50	
N-Nitrosomorpholine	59-89-2	LCS-3	10/25/16	0.200	0.174	0.87	0.201	100	3.52	
N-Nitrosopiperidine	100-75-4	LCS-3	10/19/16	0.200	0.172	0.84	0.205	103	4.54	
N-Nitrosopiperidine	100-75-4	LCS-3	10/20/16	0.200	0.167	0.86	0.195	97.6	2.11	
N-Nitrosopiperidine	100-75-4	LCS-3	10/25/16	0.200	0.185	0.91	0.203	101	1.71	
N-Nitrosopiperidine	100-75-4	LCS-3	10/25/16	0.200	0.170	0.86	0.198	98.7	4.92	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/19/16	0.200	0.178	0.87	0.205	102	4.82	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/20/16	0.200	0.165	0.85	0.195	97.5	2.21	

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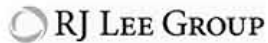
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/25/16	0.200	0.186	0.90	0.207	103	2.74	
N-Nitrosopyrrolidine	930-55-2	LCS-3	10/25/16	0.200	0.171	0.85	0.200	100	4.83	
N-Nitrosodiethylamine	55-18-5	LSC-1	10/24/16	0.200	0.195	0.96	0.204	102	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-1	10/24/16	0.200	0.202	0.99	0.204	101	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-1	10/24/16	0.200	0.186	0.89	0.209	104	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-1	10/24/16	0.200	0.190	0.94	0.202	101	2.06	
N-Nitrosodi-n-butylamine	924-16-3	LSC-1	10/24/16	0.200	0.200	0.99	0.201	100	4.00	
N-Nitrosodi-n-butylamine	924-16-3	LSC-1	10/24/16	0.200	0.211	1.03	0.204	102	1.79	
N-Nitrosodi-n-propylamine	621-64-7	LSC-1	10/24/16	0.200	0.197	0.98	0.200	100	3.25	
N-Nitrosodi-n-propylamine	621-64-7	LSC-1	10/24/16	0.200	0.204	1.02	0.201	100	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-1	10/24/16	0.200	0.193	0.94	0.205	102	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-1	10/24/16	0.200	0.198	0.98	0.202	101	0.694	
N-Nitrosomorpholine	59-89-2	LSC-1	10/24/16	0.200	0.197	0.97	0.203	101	4.33	
N-Nitrosomorpholine	59-89-2	LSC-1	10/24/16	0.200	0.206	1.02	0.201	101	0.921	
N-Nitrosopiperidine	100-75-4	LSC-1	10/24/16	0.200	0.199	0.97	0.206	103	4.83	
N-Nitrosopiperidine	100-75-4	LSC-1	10/24/16	0.200	0.202	1.00	0.202	101	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-1	10/24/16	0.200	0.188	0.93	0.202	101	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-1	10/24/16	0.200	0.198	0.99	0.200	100	0.498	
N-Nitrosodiethylamine	55-18-5	LSC-2	10/24/16	0.200	0.182	0.96	0.190	95.2	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-2	10/24/16	0.200	0.198	0.99	0.200	99.5	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-2	10/24/16	0.200	0.164	0.89	0.184	92.3	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-2	10/24/16	0.200	0.191	0.94	0.203	101	2.06	
N-Nitrosodi-n-butylamine	924-16-3	LSC-2	10/24/16	0.200	0.191	0.99	0.192	95.8	4.00	
N-Nitrosodi-n-butylamine	924-16-3	LSC-2	10/24/16	0.200	0.204	1.03	0.197	98.2	1.79	
N-Nitrosodi-n-propylamine	621-64-7	LSC-2	10/24/16	0.200	0.190	0.98	0.193	96.6	3.25	
N-Nitrosodi-n-propylamine	621-64-7	LSC-2	10/24/16	0.200	0.203	1.02	0.200	99.9	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-2	10/24/16	0.200	0.180	0.94	0.191	95.0	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-2	10/24/16	0.200	0.195	0.98	0.199	99.3	0.694	
N-Nitrosomorpholine	59-89-2	LSC-2	10/24/16	0.200	0.185	0.97	0.191	95.1	4.33	
N-Nitrosomorpholine	59-89-2	LSC-2	10/24/16	0.200	0.206	1.02	0.201	101	0.921	
N-Nitrosopiperidine	100-75-4	LSC-2	10/24/16	0.200	0.183	0.97	0.190	94.4	4.83	
N-Nitrosopiperidine	100-75-4	LSC-2	10/24/16	0.200	0.202	1.00	0.202	101	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-2	10/24/16	0.200	0.174	0.93	0.187	93.2	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-2	10/24/16	0.200	0.197	0.99	0.199	99.5	0.498	
N-Nitrosodiethylamine	55-18-5	LSC-3	10/24/16	0.200	0.197	0.96	0.206	103	4.23	
N-Nitrosodiethylamine	55-18-5	LSC-3	10/24/16	0.200	0.197	0.99	0.199	99.0	1.30	
N-Nitrosodimethylamine	62-75-9	LSC-3	10/24/16	0.200	0.184	0.89	0.207	103	6.67	
N-Nitrosodimethylamine	62-75-9	LSC-3	10/24/16	0.200	0.184	0.94	0.196	97.6	2.06	
N-Nitrosodi-n-butylamine	924-16-3	LSC-3	10/24/16	0.200	0.207	0.99	0.208	104	4.00	

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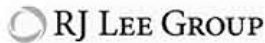
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosodi-n-butylamine	924-16-3	LSC-3	10/24/16	0.200	0.207	1.03	0.200	99.9	1.79	
N-Nitrosodi-n-propylamine	621-64-7	LSC-3	10/24/16	0.200	0.203	0.98	0.206	103	3.25	
N-Nitrosodi-n-propylamine	621-64-7	LSC-3	10/24/16	0.200	0.203	1.02	0.200	99.9	0.183	
N-Nitrosomethylethylamine	10595-95-6	LSC-3	10/24/16	0.200	0.194	0.94	0.206	103	4.30	
N-Nitrosomethylethylamine	10595-95-6	LSC-3	10/24/16	0.200	0.196	0.98	0.200	99.9	0.694	
N-Nitrosomorpholine	59-89-2	LSC-3	10/24/16	0.200	0.201	0.97	0.207	103	4.33	
N-Nitrosomorpholine	59-89-2	LSC-3	10/24/16	0.200	0.203	1.02	0.198	98.9	0.921	
N-Nitrosopiperidine	100-75-4	LSC-3	10/24/16	0.200	0.199	0.97	0.206	103	4.83	
N-Nitrosopiperidine	100-75-4	LSC-3	10/24/16	0.200	0.198	1.00	0.198	98.5	1.29	
N-Nitrosopyrrolidine	930-55-2	LSC-3	10/24/16	0.200	0.198	0.93	0.212	106	6.43	
N-Nitrosopyrrolidine	930-55-2	LSC-3	10/24/16	0.200	0.199	0.99	0.201	100	0.498	
N-Nitrosodiethylamine	55-18-5	MB	10/19/16		0.00	0.85	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/20/16		0.00	0.84	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/25/16		0.00	0.91	0.00			
N-Nitrosodiethylamine	55-18-5	MB	10/25/16		0.00	0.84	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/19/16		0.00	0.79	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/20/16		0.00	0.84	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosodimethylamine	62-75-9	MB	10/25/16		0.00	0.81	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/19/16		0.00	0.85	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosodi-n-butylamine	924-16-3	MB	10/25/16		0.00	0.88	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/19/16		0.00	0.84	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/20/16		0.00	0.86	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosodi-n-propylamine	621-64-7	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/19/16		0.00	0.86	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/25/16		0.00	0.90	0.00			
N-Nitrosomethylethylamine	10595-95-6	MB	10/25/16		0.00	0.83	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/19/16		0.00	0.92	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/20/16		0.00	0.86	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/25/16		0.00	0.92	0.00			
N-Nitrosomorpholine	59-89-2	MB	10/25/16		0.00	0.87	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/19/16		0.00	0.84	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/20/16		0.00	0.86	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/25/16		0.00	0.91	0.00			
N-Nitrosopiperidine	100-75-4	MB	10/25/16		0.00	0.86	0.00			

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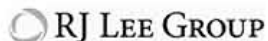
Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result µg/tube	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MB	10/19/16		0.00	0.87	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/20/16		0.00	0.85	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/25/16		0.00	0.90	0.00			
N-Nitrosopyrrolidine	930-55-2	MB	10/25/16		0.00	0.85	0.00			
N-Nitrosodiethylamine	55-18-5	MRL	10/19/16	0.020	0.020	0.85	0.024	122		
N-Nitrosodiethylamine	55-18-5	MRL	10/20/16	0.020	0.018	0.84	0.021	106		
N-Nitrosodiethylamine	55-18-5	MRL	10/24/16	0.020	0.020	0.96	0.021	106		
N-Nitrosodiethylamine	55-18-5	MRL	10/25/16	0.020	0.020	0.91	0.022	111		
N-Nitrosodiethylamine	55-18-5	MRL	10/25/16	0.020	0.018	0.84	0.021	106		
N-Nitrosodimethylamine	62-75-9	MRL	10/19/16	0.020	0.022	0.79	0.028	138		
N-Nitrosodimethylamine	62-75-9	MRL	10/20/16	0.020	0.020	0.84	0.024	121		
N-Nitrosodimethylamine	62-75-9	MRL	10/24/16	0.020	0.019	0.89	0.021	107		
N-Nitrosodimethylamine	62-75-9	MRL	10/25/16	0.020	0.021	0.87	0.024	119		
N-Nitrosodimethylamine	62-75-9	MRL	10/25/16	0.020	0.019	0.81	0.024	122		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/19/16	0.020	0.017	0.85	0.020	97.8		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/20/16	0.020	0.019	0.85	0.022	109		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/24/16	0.020	0.022	0.99	0.022	108		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/25/16	0.020	0.016	0.92	0.017	87.0		
N-Nitrosodi-n-butylamine	924-16-3	MRL	10/25/16	0.020	0.017	0.88	0.019	97.0		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/19/16	0.020	0.018	0.84	0.022	108		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/20/16	0.020	0.017	0.86	0.020	102		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/24/16	0.020	0.017	0.98	0.017	86.2		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/25/16	0.020	0.018	0.92	0.019	94.9		
N-Nitrosodi-n-propylamine	621-64-7	MRL	10/25/16	0.020	0.019	0.87	0.022	110		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/19/16	0.020	0.021	0.86	0.024	118		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/20/16	0.020	0.017	0.85	0.020	101		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/24/16	0.020	0.019	0.94	0.020	98.2		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/25/16	0.020	0.018	0.90	0.020	99.5		
N-Nitrosomethylethylamine	10595-95-6	MRL	10/25/16	0.020	0.017	0.83	0.020	100		
N-Nitrosomorpholine	59-89-2	MRL	10/19/16	0.020	0.023	0.92	0.025	127		
N-Nitrosomorpholine	59-89-2	MRL	10/20/16	0.020	0.018	0.86	0.021	105		
N-Nitrosomorpholine	59-89-2	MRL	10/24/16	0.020	0.018	0.97	0.019	93.1		
N-Nitrosomorpholine	59-89-2	MRL	10/25/16	0.020	0.020	0.92	0.022	108		
N-Nitrosomorpholine	59-89-2	MRL	10/25/16	0.020	0.019	0.87	0.022	112		
N-Nitrosopiperidine	100-75-4	MRL	10/19/16	0.020	0.021	0.84	0.025	124		
N-Nitrosopiperidine	100-75-4	MRL	10/20/16	0.020	0.019	0.86	0.022	108		
N-Nitrosopiperidine	100-75-4	MRL	10/24/16	0.020	0.017	0.97	0.018	90.1		
N-Nitrosopiperidine	100-75-4	MRL	10/25/16	0.020	0.017	0.91	0.019	92.7		
N-Nitrosopiperidine	100-75-4	MRL	10/25/16	0.020	0.019	0.86	0.022	108		

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Analyte	CAS No.	Sample ID	Analyzed Date	Expected	Result $\mu\text{g}/\text{tube}$	DE	DE Corrected	REC %	RSD %	Qualifier
N-Nitrosopyrrolidine	930-55-2	MRL	10/19/16	0.020	0.023	0.87	0.027	137		
N-Nitrosopyrrolidine	930-55-2	MRL	10/20/16	0.020	0.018	0.85	0.021	107		
N-Nitrosopyrrolidine	930-55-2	MRL	10/24/16	0.020	0.018	0.93	0.019	93.5		
N-Nitrosopyrrolidine	930-55-2	MRL	10/25/16	0.020	0.019	0.90	0.021	103		
N-Nitrosopyrrolidine	930-55-2	MRL	10/25/16	0.020	0.019	0.85	0.022	111		
N-Nitrosodiethylamine	55-18-5	MRL1	10/24/16	0.020	0.021	0.99	0.021	106		
N-Nitrosodimethylamine	62-75-9	MRL1	10/24/16	0.020	0.020	0.94	0.021	102		
N-Nitrosodi-n-butylamine	924-16-3	MRL1	10/24/16	0.020	0.018	1.03	0.017	85.7		
N-Nitrosodi-n-propylamine	621-64-7	MRL1	10/24/16	0.020	0.019	1.02	0.019	94.6		
N-Nitrosomethylethylamine	10595-95-6	MRL1	10/24/16	0.020	0.019	0.98	0.019	95.1		
N-Nitrosomorpholine	59-89-2	MRL1	10/24/16	0.020	0.018	1.02	0.018	89.1		
N-Nitrosopiperidine	100-75-4	MRL1	10/24/16	0.020	0.017	1.00	0.017	84.7		
N-Nitrosopyrrolidine	930-55-2	MRL1	10/24/16	0.020	0.019	0.99	0.019	93.6		

Report Qualifiers:

A = Target Analyte media breakthrough suspect, see analytical report

D = Analyte analyzed in a dilution

E = Report concentration was above the instrument calibration range

J = Analyte detected below quantitation limits, concentration is estimated

P = Library spectrum match, $\text{rsd} > 80\%$ w/ RT match

R = RPD (relative percent difference) outside accepted recovery limits

U = Analyte analyzed for but not detected

N/A = Not Applicable

B = Analyte detected in the associated blank

d = Data that exceeds the RSD criteria set by the SOP

H = Holding times for preparation or analysis exceeded

I = Sample condition at receipt out of compliance with method defined conditions

Q = Result out of method specific acceptance QC criteria

S = Spike Recovery outside accepted recovery limits

Z = Not ELAP accredited analyte

ND = Not Detected

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W610006

Assembler N/A		CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST				C.O.C. No. 20163073	
Collector JONES		Contact/Requestor CARL HOWARD IV				Telephone No. 373-6861	
SAF No. N/A		Sample Origin CARTRIDGE EVALUATION				MSIN T6-05	
Project Title CARTRIDGE EVALUATION		Logbook/Work Package No. N/A				Purchase Order/Charge Code 203003/GB20	
Shipped To (Lab) CBAL		Method of Shipment				Ice Chest No. 6.7	
Protocol N/A		Data Turnaround 10 DAYS				Bill of Lading/Air Bill No.	
Sample No.		Lab ID	Date	Time	No./Type Container	Sample Analysis	Preservative
	S16T035597	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-BASE-EFF	N/A
	S16T035600	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-BASE-IN	N/A
	S16T035601	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-BLANK1	N/A
	S16T035602	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-BLANK2	N/A
	S16T035603	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-A	N/A
	S16T035605	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-B	N/A
	S16T035606	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-C	N/A
	S16T035607	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-D	N/A
	S16T035608	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-E	N/A
	S16T035609	VA	10/1/16		Thermosorb-N	Nitrosamines 16-08765-12-EFF-F	N/A

Relinquished By Diane Turner		Print	Sign	Date/Time 10/4/16 10:00	Received By Re Rogers	Print	Sign	Date/Time 10/4/16 10:00
Relinquished By					Received By			
Relinquished By					Received By			
Relinquished By					Received By			

SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Scanlan Carl W Howald@rl.gov and Gregory L Scanlan@rl.gov see SOW for email		Hold Time	
CONTRACT 55503 RELEASE 5			

Relinquished By		Date/Time	Received By	Date/Time
Relinquished By			Received By	
Relinquished By			Received By	

FINAL SAMPLE DISPOSITION CONSUMED		Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Date/Time 11/03/16 12:40	
Disposited By Denese Smith					

A-6003-962 (03/05)

W610006

Assembler N/A		C.O.C. No. 20163073				Page 2 of 4	
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST							
Collector JONES	Contact/Requestor CARL HOWARD IV	Telephone No. 373-6861		MSIN T6-05 FAX 372-1878			
SAF No. N/A	Sample Origin CARTRIDGE EVALUATION	Purchase Order/Charge Code 203003/CS20					
Project Title CARTRIDGE EVALUATION	Logbook/ Work Package No. N/A	Ice Chest No.		Temp. 6.7			
Shipped To (Lab) CBAL	Method of Shipment	Bill of Lading/Air Bill No.					
Protocol N/A	Data Turnaround 10 DAYS	Parts and Return No.					
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis		Preservative	
	S16T035610	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-EFF-G		N/A	
	S16T035611	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-EFF-H		N/A	
	S16T035612	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-A		N/A	
	S16T035613	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-B		N/A	
	S16T035614	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-C		N/A	
	S16T035615	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-D		N/A	
	S16T035616	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-E		N/A	
	S16T035617	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-F		N/A	
	S16T035618	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-G		N/A	
	S16T035619	VA 10/1/16	Thermosorb-N	Nitrosamines 16-08765-12-IN-H		N/A	
POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes) MSDS <input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Hold Time							
SPECIAL INSTRUCTIONS Send Results to Carl Howard IV & Greg Scanlan Carl W. Howald@rl.gov and Gregory L. Scanlan@rl.gov see SOW for email CONFIDENTIAL 55503							
Relinquished By Dianne Turner	Print	Sign	Date/Time	Received By Re. Rogers	Print	Sign	Date/Time
Relinquished By			10/4/16 10:00	Received By			10/4/16 10:00
Relinquished By			10/4/16 1:00	Received By			10/4/16 1:00
Relinquished By				Received By			
Disposal Method (e.g., Return to customer, per lab procedure, used in process)				Date/Time			
CONSUMED				11/03/16 12:40			
Disposed By Dennese Smith				A-6003-962 (03/05)			

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-6003-962 (03/05)

W610006

Assembler		C.O.C. No.			
N/A		20163073			
CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST					
Collector		Telephone No.	MSIN		
JONES		373-6861	372-1878		
SAF No.		Purchase Order/Charge Code			
N/A		2030637/CB0			
Project Title		Temp.			
CARTRIDGE EVALUATION		6.7			
Shipped To (Lab)		Bill of Lading/Air Bill No.			
CBAL		Parts and Return No.			
Protocol		Data Turnaround			
N/A		10 DAYS			
Sample No.	Lab ID	Date	No./Type Container	Sample Analysis	Preservative
	S16T035630	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-EFF-G	N/A
	S16T035631	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-EFF-H	N/A
	S16T035632	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-A	N/A
	S16T035633	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-B	N/A
	S16T035634	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-C	N/A
	S16T035635	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-D	N/A
	S16T035636	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-E	N/A
	S16T035638	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-F	N/A
	S16T035640	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-G	N/A
	S16T035641	VA 10/2/16	Thermosorb-N	Nitrosamines 16-08766-12-IN-H	N/A

POSSIBLE SAMPLE HAZARDS/REMARKS (List all known wastes)		MSDS		Yes <input type="radio"/> No <input checked="" type="radio"/>		SPECIAL INSTRUCTIONS		Hold Time	
Relinquished By		Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	Matrix*
Dianne Turner Dunne				10/4/16 10:00	RE Rogers			10/4/16 10:00	S = Soil DL = Drum Liquids
Relinquished By		Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	SE = Sediment T = Tissue
RE Rogers				10/4/16 1:00	Under Rutherford			10/4/16 1:00	SO = Solid WI = Wipe
Relinquished By		Print	Sign	Date/Time	Received By	Print	Sign	Date/Time	SL = Sludge L = Liquid
									W = Water V = Vegetation
									O = Oil VA = Vapor
									A = Air X = Other
									DS = Drum Solids

Disposal Method (e.g., Return to customer, per lab procedure, used in process)		Disposed By		Date/Time	
CONSUMED		Dunne Smith		11/03/16 12:40	

All samples containing hazardous materials shall be picked up by requestor and returned to parent container or site of origin.

A-8003-962 (03/05)

Appendix D

Data Reduction Steps

Appendix D

Data Reduction Steps

1. Only chemicals in the current Chemicals of Potential Concern (COPC) list were included in the calculated data. Nitrous oxide and methanol were not measured in the study. Any other missing COPCs were analyzed as “Tentatively Identified Compounds.”
2. The COPCs are ranked in the order of their COPC number. Within the data section for each COPC, data are ranked in the order of survey (1 and 2). Within every survey, data are ranked in the order of inlet and outlet and following the time sequence.
3. Except for mercury, COPC concentrations were converted into parts per million (ppm) using their molecular weights and corresponding flow rates after volume correction¹⁹ as shown in the following equation:

$$C = 24.45 \frac{r}{M V}$$

where C is the concentration of COPC in ppmv; r is the analytical result with units of $\mu\text{g}/\text{sample}$ (if the analytical result unit is expressed in mg/sample , the value of C needs to be multiplied by 1000; if the analytical result unit is in ng/sample the value of C needs to be divided by 1000); V is the collected volume in 2 hours expressed in liters; M is the molecular weight of COPC expressed as g/mol . When the ratio between concentration and the corresponding Occupational Exposure Limit (OEL) is larger than 10%, the fraction is shown in red.

4. The reported volume measurements in Appendix C were made via DryCal devices placed downstream of each sample media tube. This allowed for precise volume measurements through each of the tubes. However, to perform the concentration conversion to ppm, the “actual” volumetric values required conversion to standard temperature and pressure conditions.

Ideal gas behavior was assumed for these volume corrections, and standard temperatures and pressures were assumed to be 298 K (T_{standard}) and 760 Torr (P_{standard}), respectively. For temperatures, the reported upstream temperatures for each time period were used (T_{upstream} , in Kelvin), and the temperature correction factor (i.e., the factor multiplied by each reported volume) was simply $T_{\text{standard}}/T_{\text{upstream}}$.

For the pressure corrections, additional pressure drop information was gathered so that the pressure at the point of the DryCal device could be calculated. Each time step had reported upstream pressures (P_{upstream} , or upstream of the respirator cartridges). Therefore, pressure drop measurements across the respirator cartridge and each sample media tube were performed offline to gather the additional information necessary for the correction.

The average reported pressure drop reading for the respirator cartridge ($P_{\text{cartridge}}$) tested was 3.2 inches of water column (WC). The pressure drop measurements across the individual sample tubes are shown in the table below (all expressed as inches of WC).

The average pressure drops were then used in a pressure correction factor for the reported volumes. Note that all pressure values were first converted to units of Torr. For measurements made at the inlet of the respirator cartridge the pressure correction factor is $(P_{\text{upstream}} - P_{\text{tube}}) \div P_{\text{standard}}$.

¹⁹ Based on the Standard Temperature and Pressure condition of $P=101325$ 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 $(P_{\text{upstream}} - P_{\text{cartridge}} - P_{\text{tube}}) \div P_{\text{standard}}$.

Tube Location	First Measure (inches of WC, tube on cartridge inlet side)	Second Measure (inches of WC, tube on cartridge outlet side)	Average of Both Measurements (P _{tube} , inches of WC)
A	5.0	12.4	8.7
B	6.9	7.2	7.1
C	2.3	2.5	2.4
D	0.8	0.8	0.8
E	1.9	2.1	2.0
F	3.8	6.8	5.3
G	1.6	1.7	1.7
H	7.7	6.5	7.1
I	5.2	4.0	4.6
J	15.9	16.3	16.1
K	10.1	9.7	9.9

An example calculation of the correction factors follows. For a given time period, assume that the reported upstream pressure (P_{upstream}) was 734 Torr and the corresponding temperature (T_{upstream}) was 85.9°F (or 302.9 K). Here, for tube location ‘A’ and upstream of the respirator cartridge, the corresponding temperature correction factor would be 0.984, and the pressure correction factor for the respirator cartridge outlet would be 0.944. When multiplied, these two factors equal 0.929, which would be the overall correction to the reported volume measurement.

- 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 the 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.
 - For ammonia and mercury, only the results obtained from using method of total vapor of ammonia and mercury were used.
 - For furan, results from the furan 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.
 - 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 8765 are for the SCOTT 7422-SD1 model of cartridge, and the position numbers that start with 8766 are for the SCOTT 7422-SC1 model of cartridge.

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
1	Ammonia	2	8765-A1	28.9	25	116%		2.6%
1	Ammonia	4	8765-B1	26.5	25	106%		2.59%
1	Ammonia	6	8765-C1	31.8	25	127%		2.59%
1	Ammonia	8	8765-D1	29.6	25	119%		2.59%
1	Ammonia	10	8765-E1	24.9	25	99.7%		2.59%
1	Ammonia	12	8765-F1	2.8	25	11.1%		2.59%
1	Ammonia	14	8765-G1	2.8	25	11.3%		2.59%
1	Ammonia	16	8765-H1	32.5	25	130%		2.59%
1	Ammonia	2	8765-A2	0.60	25	2.40%	YES	2.59%
1	Ammonia	4	8765-B2	0.64	25	2.54%	YES	2.59%
1	Ammonia	6	8765-C2	0.65	25	2.59%	YES	2.59%
1	Ammonia	8	8765-D2	0.64	25	2.57%	YES	2.59%
1	Ammonia	10	8765-E2	1.5	25	6.05%		2.59%
1	Ammonia	12	8765-F2	4.0	25	16.1%		2.59%
1	Ammonia	14	8765-G2	4.3	25	17.4%		2.59%
1	Ammonia	16	8765-H2	7.6	25	30.5%		2.59%
1	Ammonia	2	8766-A1	29.4	25	118%		2.59%
1	Ammonia	4	8766-B1	31.7	25	127%		2.59%
1	Ammonia	6	8766-C1	30.3	25	121%		2.59%
1	Ammonia	8	8766-D1	32.0	25	128%		2.59%
1	Ammonia	10	8766-E1	29.2	25	117%		2.59%
1	Ammonia	12	8766-F1	20.3	25	81.2%		2.59%
1	Ammonia	14	8766-G1	29.4	25	117%		2.59%
1	Ammonia	16	8766-H1	27.5	25	110%		2.59%
1	Ammonia	2	8766-A2	0.61	25	2.43%	YES	2.59%
1	Ammonia	4	8766-B2	0.62	25	2.46%	YES	2.59%
1	Ammonia	6	8766-C2	0.62	25	2.50%	YES	2.59%
1	Ammonia	8	8766-D2	0.94	25	3.75%		2.59%
1	Ammonia	10	8766-E2	1.6	25	6.41%		2.59%
1	Ammonia	12	8766-F2	3.1	25	12.2%		2.59%
1	Ammonia	14	8766-G2	5.2	25	20.8%		2.59%
1	Ammonia	16	8766-H2	8.7	25	35.0%		2.59%
3	Mercury	2	8765-A1	0.0003	0.003	10.9%		7.25%
3	Mercury	4	8765-B1	0.0003	0.003	9.86%		7.25%
3	Mercury	6	8765-C1	0.0003	0.003	10.6%		7.25%
3	Mercury	8	8765-D1	0.0004	0.003	11.6%		7.25%
3	Mercury	10	8765-E1	0.0003	0.003	10.4%		7.25%
3	Mercury	12	8765-F1	0.0003	0.003	11.1%		7.25%
3	Mercury	14	8765-G1	0.0002	0.003	7.06%	YES	7.25%
3	Mercury	16	8765-H1	0.0004	0.003	11.9%		7.25%
3	Mercury	2	8765-A2	0.0002	0.003	6.96%	YES	7.25%
3	Mercury	4	8765-B2	0.0002	0.003	7.00%	YES	7.25%
3	Mercury	6	8765-C2	0.0002	0.003	7.12%	YES	7.25%
3	Mercury	8	8765-D2	0.0002	0.003	7.25%	YES	7.25%
3	Mercury	10	8765-E2	0.0002	0.003	7.14%	YES	7.25%
3	Mercury	12	8765-F2	0.0002	0.003	7.23%	YES	7.25%
3	Mercury	14	8765-G2	0.0002	0.003	7.05%	YES	7.25%
3	Mercury	16	8765-H2	0.0002	0.003	6.99%	YES	7.25%
3	Mercury	2	8766-A1	0.0003	0.003	11.3%		7.25%
3	Mercury	4	8766-B1	0.0003	0.003	11.4%		7.25%
3	Mercury	6	8766-C1	0.0003	0.003	10.8%		7.25%
3	Mercury	8	8766-D1	0.0003	0.003	11.0%		7.25%
3	Mercury	10	8766-E1	0.0003	0.003	11.3%		7.25%
3	Mercury	12	8766-F1	0.0003	0.003	11.2%		7.25%
3	Mercury	14	8766-G1	0.0004	0.003	11.6%		7.25%
3	Mercury	16	8766-H1	0.0005	0.003	16.4%		7.25%
3	Mercury	2	8766-A2	0.0002	0.003	6.88%	YES	7.25%
3	Mercury	4	8766-B2	0.0002	0.003	6.98%	YES	7.25%
3	Mercury	6	8766-C2	0.0002	0.003	6.96%	YES	7.25%
3	Mercury	8	8766-D2	0.0002	0.003	7.04%	YES	7.25%
3	Mercury	10	8766-E2	0.0002	0.003	7.12%	YES	7.25%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
3	Mercury	12	8766-F2	0.0002	0.003	7.00%	YES	7.25%
3	Mercury	14	8766-G2	0.0002	0.003	6.94%	YES	7.25%
3	Mercury	16	8766-H2	0.0002	0.003	6.70%	YES	7.25%
4	1,3-Butadiene	2	8765-A1	0.0195	1	1.95%	YES	2.15%
4	1,3-Butadiene	4	8765-B1	0.0196	1	1.96%	YES	2.15%
4	1,3-Butadiene	6	8765-C1	0.0207	1	2.07%	YES	2.15%
4	1,3-Butadiene	8	8765-D1	0.0214	1	2.14%	YES	2.15%
4	1,3-Butadiene	10	8765-E1	0.0215	1	2.15%	YES	2.15%
4	1,3-Butadiene	12	8765-F1	0.0208	1	2.08%	YES	2.15%
4	1,3-Butadiene	14	8765-G1	0.0198	1	1.98%	YES	2.15%
4	1,3-Butadiene	16	8765-H1	0.0195	1	1.95%	YES	2.15%
4	1,3-Butadiene	2	8765-A2	0.0197	1	1.97%	YES	2.15%
4	1,3-Butadiene	4	8765-B2	0.0201	1	2.01%	YES	2.15%
4	1,3-Butadiene	6	8765-C2	0.0205	1	2.05%	YES	2.15%
4	1,3-Butadiene	8	8765-D2	0.0212	1	2.12%	YES	2.15%
4	1,3-Butadiene	10	8765-E2	0.0210	1	2.10%	YES	2.15%
4	1,3-Butadiene	12	8765-F2	0.0208	1	2.08%	YES	2.15%
4	1,3-Butadiene	14	8765-G2	0.0203	1	2.03%	YES	2.15%
4	1,3-Butadiene	16	8765-H2	0.0193	1	1.93%	YES	2.15%
4	1,3-Butadiene	2	8766-A1	0.0199	1	1.99%	YES	2.15%
4	1,3-Butadiene	4	8766-B1	0.0200	1	2.00%	YES	2.15%
4	1,3-Butadiene	6	8766-C1	0.0204	1	2.04%	YES	2.15%
4	1,3-Butadiene	8	8766-D1	0.0200	1	2.00%	YES	2.15%
4	1,3-Butadiene	10	8766-E1	0.0200	1	2.00%	YES	2.15%
4	1,3-Butadiene	12	8766-F1	0.0198	1	1.98%	YES	2.15%
4	1,3-Butadiene	14	8766-G1	0.0192	1	1.92%	YES	2.15%
4	1,3-Butadiene	16	8766-H1	0.0189	1	1.89%	YES	2.15%
4	1,3-Butadiene	2	8766-A2	0.0196	1	1.96%	YES	2.15%
4	1,3-Butadiene	4	8766-B2	0.0198	1	1.98%	YES	2.15%
4	1,3-Butadiene	6	8766-C2	0.0202	1	2.02%	YES	2.15%
4	1,3-Butadiene	8	8766-D2	0.0205	1	2.05%	YES	2.15%
4	1,3-Butadiene	10	8766-E2	0.0206	1	2.06%	YES	2.15%
4	1,3-Butadiene	12	8766-F2	0.0193	1	1.93%	YES	2.15%
4	1,3-Butadiene	14	8766-G2	0.0193	1	1.93%	YES	2.15%
4	1,3-Butadiene	16	8766-H2	0.0190	1	1.90%	YES	2.15%
5	Benzene	2	8765-A1	0.0002	0.5	0.043%		0.027%
5	Benzene	4	8765-B1	0.0002	0.5	0.036%		0.027%
5	Benzene	6	8765-C1	0.0002	0.5	0.038%		0.027%
5	Benzene	8	8765-D1	0.0002	0.5	0.042%		0.027%
5	Benzene	10	8765-E1	0.0002	0.5	0.039%		0.027%
5	Benzene	12	8765-F1	0.0002	0.5	0.044%		0.027%
5	Benzene	14	8765-G1	0.0001	0.5	0.029%		0.027%
5	Benzene	16	8765-H1	0.0002	0.5	0.036%		0.027%
5	Benzene	2	8765-A2	0.0001	0.5	0.021%	YES	0.027%
5	Benzene	4	8765-B2	0.0001	0.5	0.022%	YES	0.027%
5	Benzene	6	8765-C2	0.0001	0.5	0.023%	YES	0.027%
5	Benzene	8	8765-D2	0.0001	0.5	0.022%	YES	0.027%
5	Benzene	10	8765-E2	0.0001	0.5	0.020%	YES	0.027%
5	Benzene	12	8765-F2	0.0001	0.5	0.022%	YES	0.027%
5	Benzene	14	8765-G2	0.0001	0.5	0.021%	YES	0.027%
5	Benzene	16	8765-H2	0.0001	0.5	0.020%	YES	0.027%
5	Benzene	2	8766-A1	0.0002	0.5	0.044%		0.027%
5	Benzene	4	8766-B1	0.0003	0.5	0.063%		0.027%
5	Benzene	6	8766-C1	0.0002	0.5	0.043%		0.027%
5	Benzene	8	8766-D1	0.0002	0.5	0.043%		0.027%
5	Benzene	10	8766-E1	0.0003	0.5	0.057%		0.027%
5	Benzene	12	8766-F1	0.0002	0.5	0.049%		0.027%
5	Benzene	14	8766-G1	0.0003	0.5	0.054%		0.027%
5	Benzene	16	8766-H1	0.0003	0.5	0.060%		0.027%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
5	Benzene	2	8766-A2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	4	8766-B2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	6	8766-C2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	8	8766-D2	0.0001	0.5	0.024%	YES	0.027%
5	Benzene	10	8766-E2	0.0001	0.5	0.026%	YES	0.027%
5	Benzene	12	8766-F2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	14	8766-G2	0.0001	0.5	0.027%	YES	0.027%
5	Benzene	16	8766-H2	0.0001	0.5	0.023%	YES	0.027%
6	Biphenyl	2	8765-A1	0.0002	0.2	0.088%	YES	0.601%
6	Biphenyl	4	8765-B1	0.0002	0.2	0.086%	YES	0.601%
6	Biphenyl	6	8765-C1	0.0006	0.2	0.286%	YES	0.601%
6	Biphenyl	8	8765-D1	0.0002	0.2	0.084%	YES	0.601%
6	Biphenyl	10	8765-E1	0.0002	0.2	0.082%	YES	0.601%
6	Biphenyl	12	8765-F1	0.0002	0.2	0.082%	YES	0.601%
6	Biphenyl	14	8765-G1	0.0002	0.2	0.086%	YES	0.601%
6	Biphenyl	16	8765-H1	0.0002	0.2	0.087%	YES	0.601%
6	Biphenyl	2	8765-A2	0.0002	0.2	0.083%	YES	0.601%
6	Biphenyl	4	8765-B2	0.0002	0.2	0.083%	YES	0.601%
6	Biphenyl	6	8765-C2	0.0002	0.2	0.084%	YES	0.601%
6	Biphenyl	8	8765-D2	0.0002	0.2	0.084%	YES	0.601%
6	Biphenyl	10	8765-E2	0.0004	0.2	0.186%	YES	0.601%
6	Biphenyl	12	8765-F2	0.0002	0.2	0.082%	YES	0.601%
6	Biphenyl	14	8765-G2	0.0012	0.2	0.601%	YES	0.601%
6	Biphenyl	16	8765-H2	0.0002	0.2	0.082%	YES	0.601%
6	Biphenyl	2	8766-A1	0.0002	0.2	0.087%	YES	0.601%
6	Biphenyl	4	8766-B1	0.0002	0.2	0.087%	YES	0.601%
6	Biphenyl	6	8766-C1	0.0002	0.2	0.088%	YES	0.601%
6	Biphenyl	8	8766-D1	0.0002	0.2	0.083%	YES	0.601%
6	Biphenyl	10	8766-E1	0.0002	0.2	0.085%	YES	0.601%
6	Biphenyl	12	8766-F1	0.0002	0.2	0.083%	YES	0.601%
6	Biphenyl	14						0.601%
6	Biphenyl	16	8766-H1	0.0002	0.2	0.080%	YES	0.601%
6	Biphenyl	2	8766-A2	0.0002	0.2	0.089%	YES	0.601%
6	Biphenyl	4	8766-B2	0.0002	0.2	0.089%	YES	0.601%
6	Biphenyl	6	8766-C2	0.0002	0.2	0.089%	YES	0.601%
6	Biphenyl	8						0.601%
6	Biphenyl	10	8766-E2	0.0002	0.2	0.087%	YES	0.601%
6	Biphenyl	12	8766-F2	0.0002	0.2	0.080%	YES	0.601%
6	Biphenyl	14	8766-G2	0.0002	0.2	0.079%	YES	0.601%
6	Biphenyl	16	8766-H2	0.0002	0.2	0.077%	YES	0.601%
7	1-Butanol	2	8765-A1	0.0378	20	0.189%		0.004%
7	1-Butanol	4	8765-B1	0.0298	20	0.149%		0.004%
7	1-Butanol	6	8765-C1	0.0343	20	0.171%		0.004%
7	1-Butanol	8	8765-D1	0.0368	20	0.184%		0.004%
7	1-Butanol	10	8765-E1	0.0288	20	0.144%		0.004%
7	1-Butanol	12	8765-F1	0.0360	20	0.180%		0.004%
7	1-Butanol	14	8765-G1	0.0098	20	0.049%		0.004%
7	1-Butanol	16	8765-H1	0.0288	20	0.144%		0.004%
7	1-Butanol	2	8765-A2	0.0008	20	0.004%		0.004%
7	1-Butanol	4	8765-B2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	6	8765-C2	0.0009	20	0.004%	YES	0.004%
7	1-Butanol	8	8765-D2	0.0011	20	0.005%		0.004%
7	1-Butanol	10	8765-E2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	12	8765-F2	0.0024	20	0.012%		0.004%
7	1-Butanol	14	8765-G2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	16	8765-H2	0.0008	20	0.004%	YES	0.004%
7	1-Butanol	2	8766-A1	0.0242	20	0.121%		0.004%
7	1-Butanol	4	8766-B1	0.0093	20	0.047%		0.004%
7	1-Butanol	6	8766-C1	0.0285	20	0.142%		0.004%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
7	1-Butanol	8	8766-D1	0.0345	20	0.173%		0.004%
7	1-Butanol	10	8766-E1	0.0301	20	0.151%		0.004%
7	1-Butanol	12	8766-F1	0.0297	20	0.148%		0.004%
7	1-Butanol	14	8766-G1	0.0334	20	0.167%		0.004%
7	1-Butanol	16	8766-H1	0.0260	20	0.130%		0.004%
7	1-Butanol	2	8766-A2	0.0005	20	0.003%		0.004%
7	1-Butanol	4	8766-B2	0.0005	20	0.002%		0.004%
7	1-Butanol	6	8766-C2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	8	8766-D2	0.0005	20	0.003%		0.004%
7	1-Butanol	10	8766-E2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	12	8766-F2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	14	8766-G2	0.0004	20	0.002%	YES	0.004%
7	1-Butanol	16	8766-H2	0.0003	20	0.002%	YES	0.004%
9	2-Hexanone	2	8765-A1	0.00012	5	0.002%		0.004%
9	2-Hexanone	4	8765-B1	0.00013	5	0.003%		0.004%
9	2-Hexanone	6	8765-C1	0.00014	5	0.003%		0.004%
9	2-Hexanone	8	8765-D1	0.00013	5	0.003%		0.004%
9	2-Hexanone	10	8765-E1	0.00011	5	0.002%		0.004%
9	2-Hexanone	12	8765-F1	0.00011	5	0.002%		0.004%
9	2-Hexanone	14	8765-G1	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	16	8765-H1	0.00008	5	0.002%		0.004%
9	2-Hexanone	2	8765-A2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	4	8765-B2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	6	8765-C2	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	8	8765-D2	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	10	8765-E2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	12	8765-F2	0.00009	5	0.002%	YES	0.004%
9	2-Hexanone	14	8765-G2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	16	8765-H2	0.00008	5	0.002%	YES	0.004%
9	2-Hexanone	2	8766-A1	0.00014	5	0.003%	YES	0.004%
9	2-Hexanone	4	8766-B1	0.00016	5	0.003%		0.004%
9	2-Hexanone	6	8766-C1	0.00022	5	0.004%		0.004%
9	2-Hexanone	8	8766-D1	0.00010	5	0.002%		0.004%
9	2-Hexanone	10	8766-E1	0.00010	5	0.002%		0.004%
9	2-Hexanone	12	8766-F1	0.00010	5	0.002%		0.004%
9	2-Hexanone	14	8766-G1	0.00011	5	0.002%		0.004%
9	2-Hexanone	16	8766-H1	0.00017	5	0.003%	YES	0.004%
9	2-Hexanone	2	8766-A2	0.00017	5	0.003%	YES	0.004%
9	2-Hexanone	4	8766-B2	0.00017	5	0.003%	YES	0.004%
9	2-Hexanone	6	8766-C2	0.00017	5	0.003%	YES	0.004%
9	2-Hexanone	8	8766-D2	0.00016	5	0.003%	YES	0.004%
9	2-Hexanone	10	8766-E2	0.00017	5	0.003%	YES	0.004%
9	2-Hexanone	12	8766-F2	0.00018	5	0.004%	YES	0.004%
9	2-Hexanone	14	8766-G2	0.00018	5	0.004%	YES	0.004%
9	2-Hexanone	16	8766-H2	0.00015	5	0.003%	YES	0.004%
11	4-Methyl-2-hexanone	2	8765-A1	0.00007	0.5	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	4	8765-B1	0.00007	0.5	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	6	8765-C1	0.00007	0.5	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	8	8765-D1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	10	8765-E1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	12	8765-F1	0.00023	0.5	0.047%		0.032%
11	4-Methyl-2-hexanone	14	8765-G1	0.00023	0.5	0.045%		0.032%
11	4-Methyl-2-hexanone	16	8765-H1	0.00008	0.5	0.015%	YES	0.032%
11	4-Methyl-2-hexanone	2	8765-A2	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	4	8765-B2	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	6	8765-C2	0.00009	0.5	0.017%	YES	0.032%
11	4-Methyl-2-hexanone	8	8765-D2	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	10	8765-E2	0.00007	0.5	0.015%	YES	0.032%
11	4-Methyl-2-hexanone	12	8765-F2	0.00008	0.5	0.017%	YES	0.032%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
11	4-Methyl-2-hexanone	14	8765-G2	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	16	8765-H2	0.00008	0.5	0.015%	YES	0.032%
11	4-Methyl-2-hexanone	2	8766-A1	0.00013	0.5	0.026%	YES	0.032%
11	4-Methyl-2-hexanone	4	8766-B1	0.00007	0.5	0.014%	YES	0.032%
11	4-Methyl-2-hexanone	6	8766-C1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	8	8766-D1	0.00008	0.5	0.015%	YES	0.032%
11	4-Methyl-2-hexanone	10	8766-E1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	12	8766-F1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	14	8766-G1	0.00008	0.5	0.016%	YES	0.032%
11	4-Methyl-2-hexanone	16	8766-H1	0.00015	0.5	0.030%	YES	0.032%
11	4-Methyl-2-hexanone	2	8766-A2	0.00016	0.5	0.032%	YES	0.032%
11	4-Methyl-2-hexanone	4	8766-B2	0.00015	0.5	0.030%	YES	0.032%
11	4-Methyl-2-hexanone	6	8766-C2	0.00015	0.5	0.031%	YES	0.032%
11	4-Methyl-2-hexanone	8	8766-D2	0.00014	0.5	0.029%	YES	0.032%
11	4-Methyl-2-hexanone	10	8766-E2	0.00015	0.5	0.031%	YES	0.032%
11	4-Methyl-2-hexanone	12	8766-F2	0.00016	0.5	0.032%	YES	0.032%
11	4-Methyl-2-hexanone	14	8766-G2	0.00016	0.5	0.032%	YES	0.032%
11	4-Methyl-2-hexanone	16	8766-H2	0.00013	0.5	0.027%	YES	0.032%
13	3-Buten-2-one	2	8765-A1	0.00014	0.2	0.072%	YES	0.096%
13	3-Buten-2-one	4	8765-B1	0.00090	0.2	0.451%		0.096%
13	3-Buten-2-one	6	8765-C1	0.00015	0.2	0.075%	YES	0.096%
13	3-Buten-2-one	8	8765-D1	0.00017	0.2	0.083%	YES	0.096%
13	3-Buten-2-one	10	8765-E1	0.00017	0.2	0.083%	YES	0.096%
13	3-Buten-2-one	12	8765-F1	0.00025	0.2	0.124%		0.096%
13	3-Buten-2-one	14	8765-G1	0.00016	0.2	0.080%	YES	0.096%
13	3-Buten-2-one	16	8765-H1	0.00016	0.2	0.081%	YES	0.096%
13	3-Buten-2-one	2	8765-A2	0.00017	0.2	0.083%	YES	0.096%
13	3-Buten-2-one	4	8765-B2	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	6	8765-C2	0.00018	0.2	0.091%	YES	0.096%
13	3-Buten-2-one	8	8765-D2	0.00017	0.2	0.087%	YES	0.096%
13	3-Buten-2-one	10	8765-E2	0.00016	0.2	0.079%	YES	0.096%
13	3-Buten-2-one	12	8765-F2	0.00018	0.2	0.088%	YES	0.096%
13	3-Buten-2-one	14	8765-G2	0.00017	0.2	0.084%	YES	0.096%
13	3-Buten-2-one	16	8765-H2	0.00016	0.2	0.081%	YES	0.096%
13	3-Buten-2-one	2	8766-A1	0.00091	0.2	0.454%		0.096%
13	3-Buten-2-one	4	8766-B1	0.00082	0.2	0.408%		0.096%
13	3-Buten-2-one	6	8766-C1	0.00035	0.2	0.176%		0.096%
13	3-Buten-2-one	8	8766-D1	0.00023	0.2	0.115%		0.096%
13	3-Buten-2-one	10	8766-E1	0.00025	0.2	0.124%		0.096%
13	3-Buten-2-one	12	8766-F1	0.00026	0.2	0.132%		0.096%
13	3-Buten-2-one	14	8766-G1	0.00021	0.2	0.106%		0.096%
13	3-Buten-2-one	16	8766-H1	0.00090	0.2	0.450%		0.096%
13	3-Buten-2-one	2	8766-A2	0.00019	0.2	0.094%	YES	0.096%
13	3-Buten-2-one	4	8766-B2	0.00018	0.2	0.090%	YES	0.096%
13	3-Buten-2-one	6	8766-C2	0.00018	0.2	0.091%	YES	0.096%
13	3-Buten-2-one	8	8766-D2	0.00017	0.2	0.085%	YES	0.096%
13	3-Buten-2-one	10	8766-E2	0.00018	0.2	0.091%	YES	0.096%
13	3-Buten-2-one	12	8766-F2	0.00019	0.2	0.096%	YES	0.096%
13	3-Buten-2-one	14	8766-G2	0.00019	0.2	0.096%	YES	0.096%
13	3-Buten-2-one	16	8766-H2	0.00016	0.2	0.080%	YES	0.096%
14	Formaldehyde	2	8765-A1	0.0131	0.3	4.37%		0.62%
14	Formaldehyde	4	8765-B1	0.0043	0.3	1.43%		0.62%
14	Formaldehyde	6	8765-C1	0.0057	0.3	1.91%		0.62%
14	Formaldehyde	8	8765-D1	0.0047	0.3	1.56%		0.62%
14	Formaldehyde	10	8765-E1	0.0030	0.3	1.00%		0.62%
14	Formaldehyde	12	8765-F1	0.0069	0.3	2.30%		0.62%
14	Formaldehyde	14	8765-G1	0.0021	0.3	0.69%		0.62%
14	Formaldehyde	16	8765-H1	0.0049	0.3	1.65%		0.62%
14	Formaldehyde	2	8765-A2	0.0019	0.3	0.63%		0.62%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
14	Formaldehyde	4	8765-B2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	6	8765-C2	0.0020	0.3	0.66%		0.62%
14	Formaldehyde	8	8765-D2	0.0019	0.3	0.62%	YES	0.62%
14	Formaldehyde	10	8765-E2	0.0019	0.3	0.62%	YES	0.62%
14	Formaldehyde	12	8765-F2	0.0022	0.3	0.74%		0.62%
14	Formaldehyde	14	8765-G2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	16	8765-H2	0.0018	0.3	0.59%	YES	0.62%
14	Formaldehyde	2	8766-A1	0.0115	0.3	3.84%		0.62%
14	Formaldehyde	4	8766-B1	0.0112	0.3	3.73%		0.62%
14	Formaldehyde	6	8766-C1	0.0034	0.3	1.12%		0.62%
14	Formaldehyde	8	8766-D1	0.0061	0.3	2.04%		0.62%
14	Formaldehyde	10	8766-E1	0.0032	0.3	1.07%		0.62%
14	Formaldehyde	12	8766-F1	0.0029	0.3	0.97%		0.62%
14	Formaldehyde	14	8766-G1	0.0028	0.3	0.95%		0.62%
14	Formaldehyde	16	8766-H1	0.0029	0.3	0.97%		0.62%
14	Formaldehyde	2	8766-A2	0.0022	0.3	0.73%		0.62%
14	Formaldehyde	4	8766-B2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	6	8766-C2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	8	8766-D2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	10	8766-E2	0.0018	0.3	0.61%	YES	0.62%
14	Formaldehyde	12	8766-F2	0.0018	0.3	0.59%	YES	0.62%
14	Formaldehyde	14	8766-G2	0.0018	0.3	0.59%	YES	0.62%
14	Formaldehyde	16	8766-H2	0.0017	0.3	0.58%	YES	0.62%
15	Acetaldehyde	2	8765-A1	0.0147	25	0.059%		0.005%
15	Acetaldehyde	4	8765-B1	0.0144	25	0.058%		0.005%
15	Acetaldehyde	6	8765-C1	0.0151	25	0.060%		0.005%
15	Acetaldehyde	8	8765-D1	0.0147	25	0.059%		0.005%
15	Acetaldehyde	10	8765-E1	0.0136	25	0.054%		0.005%
15	Acetaldehyde	12	8765-F1	0.0144	25	0.058%		0.005%
15	Acetaldehyde	14	8765-G1	0.0029	25	0.012%		0.005%
15	Acetaldehyde	16	8765-H1	0.0137	25	0.055%		0.005%
15	Acetaldehyde	2	8765-A2	0.0077	25	0.031%		0.005%
15	Acetaldehyde	4	8765-B2	0.0072	25	0.029%		0.005%
15	Acetaldehyde	6	8765-C2	0.0090	25	0.036%		0.005%
15	Acetaldehyde	8	8765-D2	0.0092	25	0.037%		0.005%
15	Acetaldehyde	10	8765-E2	0.0084	25	0.034%		0.005%
15	Acetaldehyde	12	8765-F2	0.0093	25	0.037%		0.005%
15	Acetaldehyde	14	8765-G2	0.0069	25	0.028%		0.005%
15	Acetaldehyde	16	8765-H2	0.0085	25	0.034%		0.005%
15	Acetaldehyde	2	8766-A1	0.0136	25	0.054%		0.005%
15	Acetaldehyde	4	8766-B1	0.0143	25	0.057%		0.005%
15	Acetaldehyde	6	8766-C1	0.0131	25	0.052%		0.005%
15	Acetaldehyde	8	8766-D1	0.0135	25	0.054%		0.005%
15	Acetaldehyde	10	8766-E1	0.0130	25	0.052%		0.005%
15	Acetaldehyde	12	8766-F1	0.0128	25	0.051%		0.005%
15	Acetaldehyde	14	8766-G1	0.0125	25	0.050%		0.005%
15	Acetaldehyde	16	8766-H1	0.0131	25	0.052%		0.005%
15	Acetaldehyde	2	8766-A2	0.0069	25	0.028%		0.005%
15	Acetaldehyde	4	8766-B2	0.0089	25	0.036%		0.005%
15	Acetaldehyde	6	8766-C2	0.0084	25	0.034%		0.005%
15	Acetaldehyde	8	8766-D2	0.0090	25	0.036%		0.005%
15	Acetaldehyde	10	8766-E2	0.0072	25	0.029%		0.005%
15	Acetaldehyde	12	8766-F2	0.0080	25	0.032%		0.005%
15	Acetaldehyde	14	8766-G2	0.0075	25	0.030%		0.005%
15	Acetaldehyde	16	8766-H2	0.0071	25	0.029%		0.005%
16	Butanal	2	8765-A1	0.00043	25	0.002%		0.001%
16	Butanal	4	8765-B1	0.00034	25	0.001%		0.001%
16	Butanal	6	8765-C1	0.00028	25	0.001%		0.001%
16	Butanal	8	8765-D1	0.00039	25	0.002%		0.001%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
16	Butanal	10	8765-E1	0.00030	25	0.001%		0.001%
16	Butanal	12	8765-F1	0.00045	25	0.002%		0.001%
16	Butanal	14	8765-G1	0.00019	25	0.001%	YES	0.001%
16	Butanal	16	8765-H1	0.00019	25	0.001%	YES	0.001%
16	Butanal	2	8765-A2	0.00023	25	0.001%		0.001%
16	Butanal	4	8765-B2	0.00020	25	0.001%	YES	0.001%
16	Butanal	6	8765-C2	0.00022	25	0.001%	YES	0.001%
16	Butanal	8	8765-D2	0.00021	25	0.001%	YES	0.001%
16	Butanal	10	8765-E2	0.00019	25	0.001%	YES	0.001%
16	Butanal	12	8765-F2	0.00021	25	0.001%	YES	0.001%
16	Butanal	14	8765-G2	0.00020	25	0.001%	YES	0.001%
16	Butanal	16	8765-H2	0.00019	25	0.001%	YES	0.001%
16	Butanal	2	8766-A1	0.00035	25	0.001%		0.001%
16	Butanal	4	8766-B1	0.00018	25	0.001%	YES	0.001%
16	Butanal	6	8766-C1	0.00047	25	0.002%		0.001%
16	Butanal	8	8766-D1	0.00035	25	0.001%		0.001%
16	Butanal	10	8766-E1	0.00040	25	0.002%		0.001%
16	Butanal	12	8766-F1	0.00020	25	0.001%	YES	0.001%
16	Butanal	14	8766-G1	0.00026	25	0.001%		0.001%
16	Butanal	16	8766-H1	0.00028	25	0.001%	YES	0.001%
16	Butanal	2	8766-A2	0.00029	25	0.001%	YES	0.001%
16	Butanal	4	8766-B2	0.00028	25	0.001%	YES	0.001%
16	Butanal	6	8766-C2	0.00028	25	0.001%	YES	0.001%
16	Butanal	8	8766-D2	0.00026	25	0.001%	YES	0.001%
16	Butanal	10	8766-E2	0.00028	25	0.001%	YES	0.001%
16	Butanal	12	8766-F2	0.00029	25	0.001%	YES	0.001%
16	Butanal	14	8766-G2	0.00029	25	0.001%	YES	0.001%
16	Butanal	16	8766-H2	0.00024	25	0.001%	YES	0.001%
19	Furan	2	8765-A1	0.000054	0.001	5.43%	YES	5.81%
19	Furan	4	8765-B1	0.000053	0.001	5.30%	YES	5.81%
19	Furan	6	8765-C1	0.000053	0.001	5.28%	YES	5.81%
19	Furan	8	8765-D1	0.000055	0.001	5.47%	YES	5.81%
19	Furan	10	8765-E1	0.000055	0.001	5.54%	YES	5.81%
19	Furan	12	8765-F1	0.000055	0.001	5.55%	YES	5.81%
19	Furan	14	8765-G1	0.000054	0.001	5.45%	YES	5.81%
19	Furan	16	8765-H1	0.000055	0.001	5.47%	YES	5.81%
19	Furan	2	8765-A2	0.000036	0.001	3.58%	YES	5.81%
19	Furan	4	8765-B2	0.000035	0.001	3.46%	YES	5.81%
19	Furan	6	8765-C2	0.000035	0.001	3.46%	YES	5.81%
19	Furan	8	8765-D2	0.000035	0.001	3.49%	YES	5.81%
19	Furan	10	8765-E2	0.000035	0.001	3.51%	YES	5.81%
19	Furan	12	8765-F2	0.000036	0.001	3.61%	YES	5.81%
19	Furan	14	8765-G2	0.000036	0.001	3.55%	YES	5.81%
19	Furan	16	8765-H2	0.000036	0.001	3.65%	YES	5.81%
19	Furan	2	8766-A1	0.000052	0.001	5.19%	YES	5.81%
19	Furan	4	8766-B1	0.000053	0.001	5.30%	YES	5.81%
19	Furan	6	8766-C1	0.000037	0.001	3.73%	YES	5.81%
19	Furan	8	8766-D1	0.000057	0.001	5.73%	YES	5.81%
19	Furan	10	8766-E1	0.000057	0.001	5.74%	YES	5.81%
19	Furan	12	8766-F1	0.000058	0.001	5.79%	YES	5.81%
19	Furan	14	8766-G1	0.000058	0.001	5.81%	YES	5.81%
19	Furan	16	8766-H1	0.000035	0.001	3.52%	YES	5.81%
19	Furan	2	8766-A2	0.000034	0.001	3.41%	YES	5.81%
19	Furan	4	8766-B2	0.000038	0.001	3.77%	YES	5.81%
19	Furan	6	8766-C2	0.000057	0.001	5.69%	YES	5.81%
19	Furan	8	8766-D2	0.000038	0.001	3.79%	YES	5.81%
19	Furan	10	8766-E2	0.000039	0.001	3.86%	YES	5.81%
19	Furan	12						5.81%
19	Furan	14	8766-G2	0.000035	0.001	3.53%	YES	5.81%
19	Furan	16	8766-H2	0.000058	0.001	5.81%	YES	5.81%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
20	2,3-Dihydrofuran	2	8765-A1	0.000029	0.001	2.91%	YES	3.11%
20	2,3-Dihydrofuran	4	8765-B1	0.000028	0.001	2.84%	YES	3.11%
20	2,3-Dihydrofuran	6	8765-C1	0.000028	0.001	2.83%	YES	3.11%
20	2,3-Dihydrofuran	8	8765-D1	0.000029	0.001	2.93%	YES	3.11%
20	2,3-Dihydrofuran	10	8765-E1	0.000030	0.001	2.97%	YES	3.11%
20	2,3-Dihydrofuran	12	8765-F1	0.000030	0.001	2.97%	YES	3.11%
20	2,3-Dihydrofuran	14	8765-G1	0.000029	0.001	2.92%	YES	3.11%
20	2,3-Dihydrofuran	16	8765-H1	0.000029	0.001	2.93%	YES	3.11%
20	2,3-Dihydrofuran	2	8765-A2	0.000019	0.001	1.92%	YES	3.11%
20	2,3-Dihydrofuran	4	8765-B2	0.000019	0.001	1.86%	YES	3.11%
20	2,3-Dihydrofuran	6	8765-C2	0.000019	0.001	1.85%	YES	3.11%
20	2,3-Dihydrofuran	8	8765-D2	0.000019	0.001	1.87%	YES	3.11%
20	2,3-Dihydrofuran	10	8765-E2	0.000019	0.001	1.88%	YES	3.11%
20	2,3-Dihydrofuran	12	8765-F2	0.000019	0.001	1.93%	YES	3.11%
20	2,3-Dihydrofuran	14	8765-G2	0.000019	0.001	1.90%	YES	3.11%
20	2,3-Dihydrofuran	16	8765-H2	0.000020	0.001	1.95%	YES	3.11%
20	2,3-Dihydrofuran	2	8766-A1	0.000028	0.001	2.78%	YES	3.11%
20	2,3-Dihydrofuran	4	8766-B1	0.000028	0.001	2.84%	YES	3.11%
20	2,3-Dihydrofuran	6	8766-C1	0.000020	0.001	2.00%	YES	3.11%
20	2,3-Dihydrofuran	8	8766-D1	0.000031	0.001	3.07%	YES	3.11%
20	2,3-Dihydrofuran	10	8766-E1	0.000031	0.001	3.07%	YES	3.11%
20	2,3-Dihydrofuran	12	8766-F1	0.000031	0.001	3.10%	YES	3.11%
20	2,3-Dihydrofuran	14	8766-G1	0.000031	0.001	3.11%	YES	3.11%
20	2,3-Dihydrofuran	16	8766-H1	0.000019	0.001	1.89%	YES	3.11%
20	2,3-Dihydrofuran	2	8766-A2	0.000018	0.001	1.82%	YES	3.11%
20	2,3-Dihydrofuran	4	8766-B2	0.000020	0.001	2.02%	YES	3.11%
20	2,3-Dihydrofuran	6	8766-C2	0.000031	0.001	3.05%	YES	3.11%
20	2,3-Dihydrofuran	8	8766-D2	0.000020	0.001	2.03%	YES	3.11%
20	2,3-Dihydrofuran	10	8766-E2	0.000021	0.001	2.07%	YES	3.11%
20	2,3-Dihydrofuran	12						3.11%
20	2,3-Dihydrofuran	14	8766-G2	0.000019	0.001	1.89%	YES	3.11%
20	2,3-Dihydrofuran	16	8766-H2	0.000031	0.001	3.11%	YES	3.11%
21	2,5-Dihydrofuran	2	8765-A1	0.000068	0.001	6.81%		4.38%
21	2,5-Dihydrofuran	4	8765-B1	0.000107	0.001	10.7%		4.38%
21	2,5-Dihydrofuran	6	8765-C1	0.000040	0.001	3.97%	YES	4.38%
21	2,5-Dihydrofuran	8	8765-D1	0.000043	0.001	4.30%		4.38%
21	2,5-Dihydrofuran	10	8765-E1	0.000045	0.001	4.45%		4.38%
21	2,5-Dihydrofuran	12	8765-F1	0.000083	0.001	8.27%		4.38%
21	2,5-Dihydrofuran	14	8765-G1	0.000041	0.001	4.10%	YES	4.38%
21	2,5-Dihydrofuran	16	8765-H1	0.000041	0.001	4.12%	YES	4.38%
21	2,5-Dihydrofuran	2	8765-A2	0.000027	0.001	2.70%	YES	4.38%
21	2,5-Dihydrofuran	4	8765-B2	0.000026	0.001	2.61%	YES	4.38%
21	2,5-Dihydrofuran	6	8765-C2	0.000026	0.001	2.61%	YES	4.38%
21	2,5-Dihydrofuran	8	8765-D2	0.000026	0.001	2.63%	YES	4.38%
21	2,5-Dihydrofuran	10	8765-E2	0.000026	0.001	2.65%	YES	4.38%
21	2,5-Dihydrofuran	12	8765-F2	0.000027	0.001	2.72%	YES	4.38%
21	2,5-Dihydrofuran	14	8765-G2	0.000027	0.001	2.68%	YES	4.38%
21	2,5-Dihydrofuran	16	8765-H2	0.000027	0.001	2.75%	YES	4.38%
21	2,5-Dihydrofuran	2	8766-A1	0.000039	0.001	3.91%	YES	4.38%
21	2,5-Dihydrofuran	4	8766-B1	0.000040	0.001	3.99%	YES	4.38%
21	2,5-Dihydrofuran	6	8766-C1	0.000028	0.001	2.81%	YES	4.38%
21	2,5-Dihydrofuran	8	8766-D1	0.000043	0.001	4.32%	YES	4.38%
21	2,5-Dihydrofuran	10	8766-E1	0.000043	0.001	4.32%	YES	4.38%
21	2,5-Dihydrofuran	12	8766-F1	0.000044	0.001	4.36%	YES	4.38%
21	2,5-Dihydrofuran	14	8766-G1	0.000044	0.001	4.37%	YES	4.38%
21	2,5-Dihydrofuran	16	8766-H1	0.000027	0.001	2.65%	YES	4.38%
21	2,5-Dihydrofuran	2	8766-A2	0.000026	0.001	2.57%	YES	4.38%
21	2,5-Dihydrofuran	4	8766-B2	0.000028	0.001	2.84%	YES	4.38%
21	2,5-Dihydrofuran	6	8766-C2	0.000043	0.001	4.29%	YES	4.38%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL? RL?	Approx. DL? RL
21	2,5-Dihydrofuran	8	8766-D2	0.000029	0.001	2.86%	YES	4.38%
21	2,5-Dihydrofuran	10	8766-E2	0.000029	0.001	2.91%	YES	4.38%
21	2,5-Dihydrofuran	12						4.38%
21	2,5-Dihydrofuran	14	8766-G2	0.000027	0.001	2.66%	YES	4.38%
21	2,5-Dihydrofuran	16	8766-H2	0.000044	0.001	4.38%	YES	4.38%
22	2-Methylfuran	2	8765-A1	0.000012	0.001	1.16%	YES	1.25%
22	2-Methylfuran	4	8765-B1	0.000011	0.001	1.14%		1.25%
22	2-Methylfuran	6	8765-C1	0.000011	0.001	1.13%	YES	1.25%
22	2-Methylfuran	8	8765-D1	0.000013	0.001	1.33%		1.25%
22	2-Methylfuran	10	8765-E1	0.000012	0.001	1.19%	YES	1.25%
22	2-Methylfuran	12	8765-F1	0.000012	0.001	1.19%	YES	1.25%
22	2-Methylfuran	14	8765-G1	0.000012	0.001	1.17%	YES	1.25%
22	2-Methylfuran	16	8765-H1	0.000012	0.001	1.17%	YES	1.25%
22	2-Methylfuran	2	8765-A2	0.000008	0.001	0.77%	YES	1.25%
22	2-Methylfuran	4	8765-B2	0.000007	0.001	0.74%	YES	1.25%
22	2-Methylfuran	6	8765-C2	0.000015	0.001	1.53%		1.25%
22	2-Methylfuran	8	8765-D2	0.000007	0.001	0.75%	YES	1.25%
22	2-Methylfuran	10	8765-E2	0.000008	0.001	0.75%	YES	1.25%
22	2-Methylfuran	12	8765-F2	0.000008	0.001	0.77%	YES	1.25%
22	2-Methylfuran	14	8765-G2	0.000008	0.001	0.76%	YES	1.25%
22	2-Methylfuran	16	8765-H2	0.000008	0.001	0.78%	YES	1.25%
22	2-Methylfuran	2	8766-A1	0.000011	0.001	1.11%	YES	1.25%
22	2-Methylfuran	4	8766-B1	0.000011	0.001	1.14%	YES	1.25%
22	2-Methylfuran	6	8766-C1	0.000008	0.001	0.80%	YES	1.25%
22	2-Methylfuran	8	8766-D1	0.000012	0.001	1.23%	YES	1.25%
22	2-Methylfuran	10	8766-E1	0.000012	0.001	1.23%	YES	1.25%
22	2-Methylfuran	12	8766-F1	0.000012	0.001	1.24%	YES	1.25%
22	2-Methylfuran	14	8766-G1	0.000012	0.001	1.24%	YES	1.25%
22	2-Methylfuran	16	8766-H1	0.000008	0.001	0.76%	YES	1.25%
22	2-Methylfuran	2	8766-A2	0.000009	0.001	0.88%		1.25%
22	2-Methylfuran	4	8766-B2	0.000008	0.001	0.81%	YES	1.25%
22	2-Methylfuran	6	8766-C2	0.000012	0.001	1.22%	YES	1.25%
22	2-Methylfuran	8	8766-D2	0.000008	0.001	0.81%	YES	1.25%
22	2-Methylfuran	10	8766-E2	0.000008	0.001	0.83%	YES	1.25%
22	2-Methylfuran	12						1.25%
22	2-Methylfuran	14	8766-G2	0.000008	0.001	0.76%	YES	1.25%
22	2-Methylfuran	16	8766-H2	0.000012	0.001	1.25%	YES	1.25%
23	2,5-Dimethylfuran	2	8765-A1	0.000017	0.001	1.72%	YES	1.84%
23	2,5-Dimethylfuran	4	8765-B1	0.000017	0.001	1.68%	YES	1.84%
23	2,5-Dimethylfuran	6	8765-C1	0.000017	0.001	1.67%	YES	1.84%
23	2,5-Dimethylfuran	8	8765-D1	0.000017	0.001	1.73%	YES	1.84%
23	2,5-Dimethylfuran	10	8765-E1	0.000018	0.001	1.76%	YES	1.84%
23	2,5-Dimethylfuran	12	8765-F1	0.000018	0.001	1.76%	YES	1.84%
23	2,5-Dimethylfuran	14	8765-G1	0.000017	0.001	1.73%	YES	1.84%
23	2,5-Dimethylfuran	16	8765-H1	0.000017	0.001	1.73%	YES	1.84%
23	2,5-Dimethylfuran	2	8765-A2	0.000011	0.001	1.14%	YES	1.84%
23	2,5-Dimethylfuran	4	8765-B2	0.000011	0.001	1.10%	YES	1.84%
23	2,5-Dimethylfuran	6	8765-C2	0.000011	0.001	1.10%	YES	1.84%
23	2,5-Dimethylfuran	8	8765-D2	0.000011	0.001	1.11%	YES	1.84%
23	2,5-Dimethylfuran	10	8765-E2	0.000011	0.001	1.12%	YES	1.84%
23	2,5-Dimethylfuran	12	8765-F2	0.000011	0.001	1.14%	YES	1.84%
23	2,5-Dimethylfuran	14	8765-G2	0.000011	0.001	1.13%	YES	1.84%
23	2,5-Dimethylfuran	16	8765-H2	0.000012	0.001	1.16%	YES	1.84%
23	2,5-Dimethylfuran	2	8766-A1	0.000016	0.001	1.65%	YES	1.84%
23	2,5-Dimethylfuran	4	8766-B1	0.000017	0.001	1.68%	YES	1.84%
23	2,5-Dimethylfuran	6	8766-C1	0.000012	0.001	1.19%	YES	1.84%
23	2,5-Dimethylfuran	8	8766-D1	0.000018	0.001	1.82%	YES	1.84%
23	2,5-Dimethylfuran	10	8766-E1	0.000018	0.001	1.82%	YES	1.84%
23	2,5-Dimethylfuran	12	8766-F1	0.000018	0.001	1.84%	YES	1.84%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
23	2,5-Dimethylfuran	14	8766-G1	0.000018	0.001	1.84%	YES	1.84%
23	2,5-Dimethylfuran	16	8766-H1	0.000011	0.001	1.12%	YES	1.84%
23	2,5-Dimethylfuran	2	8766-A2	0.000011	0.001	1.08%	YES	1.84%
23	2,5-Dimethylfuran	4	8766-B2	0.000012	0.001	1.20%	YES	1.84%
23	2,5-Dimethylfuran	6	8766-C2	0.000018	0.001	1.81%	YES	1.84%
23	2,5-Dimethylfuran	8	8766-D2	0.000012	0.001	1.20%	YES	1.84%
23	2,5-Dimethylfuran	10	8766-E2	0.000012	0.001	1.23%	YES	1.84%
23	2,5-Dimethylfuran	12						1.84%
23	2,5-Dimethylfuran	14	8766-G2	0.000011	0.001	1.12%	YES	1.84%
23	2,5-Dimethylfuran	16	8766-H2	0.000018	0.001	1.84%	YES	1.84%
27	2-Pentylfuran	2	8765-A1	0.000013	0.001	1.34%	YES	1.43%
27	2-Pentylfuran	4	8765-B1	0.000031	0.001	3.11%		1.43%
27	2-Pentylfuran	6	8765-C1	0.000013	0.001	1.30%	YES	1.43%
27	2-Pentylfuran	8	8765-D1	0.000013	0.001	1.35%	YES	1.43%
27	2-Pentylfuran	10	8765-E1	0.000014	0.001	1.36%	YES	1.43%
27	2-Pentylfuran	12	8765-F1	0.000031	0.001	3.11%		1.43%
27	2-Pentylfuran	14	8765-G1	0.000013	0.001	1.34%	YES	1.43%
27	2-Pentylfuran	16	8765-H1	0.000013	0.001	1.35%	YES	1.43%
27	2-Pentylfuran	2	8765-A2	0.000009	0.001	0.88%	YES	1.43%
27	2-Pentylfuran	4	8765-B2	0.000009	0.001	0.85%	YES	1.43%
27	2-Pentylfuran	6	8765-C2	0.000009	0.001	0.85%	YES	1.43%
27	2-Pentylfuran	8	8765-D2	0.000009	0.001	0.86%	YES	1.43%
27	2-Pentylfuran	10	8765-E2	0.000009	0.001	0.87%	YES	1.43%
27	2-Pentylfuran	12	8765-F2	0.000009	0.001	0.89%	YES	1.43%
27	2-Pentylfuran	14	8765-G2	0.000009	0.001	0.87%	YES	1.43%
27	2-Pentylfuran	16	8765-H2	0.000009	0.001	0.90%	YES	1.43%
27	2-Pentylfuran	2	8766-A1	0.000013	0.001	1.28%	YES	1.43%
27	2-Pentylfuran	4	8766-B1	0.000013	0.001	1.30%	YES	1.43%
27	2-Pentylfuran	6	8766-C1	0.000009	0.001	0.92%	YES	1.43%
27	2-Pentylfuran	8	8766-D1	0.000014	0.001	1.41%	YES	1.43%
27	2-Pentylfuran	10	8766-E1	0.000014	0.001	1.41%	YES	1.43%
27	2-Pentylfuran	12	8766-F1	0.000014	0.001	1.42%	YES	1.43%
27	2-Pentylfuran	14	8766-G1	0.000014	0.001	1.43%	YES	1.43%
27	2-Pentylfuran	16	8766-H1	0.000009	0.001	0.87%	YES	1.43%
27	2-Pentylfuran	2	8766-A2	0.000020	0.001	1.97%		1.43%
27	2-Pentylfuran	4	8766-B2	0.000009	0.001	0.93%	YES	1.43%
27	2-Pentylfuran	6	8766-C2	0.000014	0.001	1.40%	YES	1.43%
27	2-Pentylfuran	8	8766-D2	0.000009	0.001	0.93%	YES	1.43%
27	2-Pentylfuran	10	8766-E2	0.000010	0.001	0.95%	YES	1.43%
27	2-Pentylfuran	12						1.43%
27	2-Pentylfuran	14	8766-G2	0.000009	0.001	0.87%	YES	1.43%
27	2-Pentylfuran	16	8766-H2	0.000014	0.001	1.43%	YES	1.43%
28	2-Heptylfuran	2	8765-A1	0.000015	0.001	1.46%	YES	1.56%
28	2-Heptylfuran	4	8765-B1	0.000014	0.001	1.42%	YES	1.56%
28	2-Heptylfuran	6	8765-C1	0.000014	0.001	1.42%	YES	1.56%
28	2-Heptylfuran	8	8765-D1	0.000015	0.001	1.47%	YES	1.56%
28	2-Heptylfuran	10	8765-E1	0.000015	0.001	1.49%	YES	1.56%
28	2-Heptylfuran	12	8765-F1	0.000015	0.001	1.49%	YES	1.56%
28	2-Heptylfuran	14	8765-G1	0.000015	0.001	1.46%	YES	1.56%
28	2-Heptylfuran	16	8765-H1	0.000015	0.001	1.47%	YES	1.56%
28	2-Heptylfuran	2	8765-A2	0.000010	0.001	0.96%	YES	1.56%
28	2-Heptylfuran	4	8765-B2	0.000009	0.001	0.93%	YES	1.56%
28	2-Heptylfuran	6	8765-C2	0.000009	0.001	0.93%	YES	1.56%
28	2-Heptylfuran	8	8765-D2	0.000009	0.001	0.93%	YES	1.56%
28	2-Heptylfuran	10	8765-E2	0.000009	0.001	0.94%	YES	1.56%
28	2-Heptylfuran	12	8765-F2	0.000010	0.001	0.97%	YES	1.56%
28	2-Heptylfuran	14	8765-G2	0.000010	0.001	0.95%	YES	1.56%
28	2-Heptylfuran	16	8765-H2	0.000010	0.001	0.98%	YES	1.56%
28	2-Heptylfuran	2	8766-A1	0.000014	0.001	1.39%	YES	1.56%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
28	2-Heptylfuran	4	8766-B1	0.000014	0.001	1.42%	YES	1.56%
28	2-Heptylfuran	6	8766-C1	0.000010	0.001	1.00%	YES	1.56%
28	2-Heptylfuran	8	8766-D1	0.000015	0.001	1.54%	YES	1.56%
28	2-Heptylfuran	10	8766-E1	0.000015	0.001	1.54%	YES	1.56%
28	2-Heptylfuran	12	8766-F1	0.000016	0.001	1.55%	YES	1.56%
28	2-Heptylfuran	14	8766-G1	0.000016	0.001	1.56%	YES	1.56%
28	2-Heptylfuran	16	8766-H1	0.000009	0.001	0.95%	YES	1.56%
28	2-Heptylfuran	2	8766-A2	0.000015	0.001	1.51%		1.56%
28	2-Heptylfuran	4	8766-B2	0.000010	0.001	1.01%	YES	1.56%
28	2-Heptylfuran	6	8766-C2	0.000015	0.001	1.53%	YES	1.56%
28	2-Heptylfuran	8	8766-D2	0.000010	0.001	1.02%	YES	1.56%
28	2-Heptylfuran	10	8766-E2	0.000010	0.001	1.04%	YES	1.56%
28	2-Heptylfuran	12						1.56%
28	2-Heptylfuran	14	8766-G2	0.000009	0.001	0.95%	YES	1.56%
28	2-Heptylfuran	16	8766-H2	0.000016	0.001	1.56%	YES	1.56%
29	2-Propylfuran	2	8765-A1	0.000012	0.001	1.21%	YES	1.30%
29	2-Propylfuran	4	8765-B1	0.000012	0.001	1.19%	YES	1.30%
29	2-Propylfuran	6	8765-C1	0.000012	0.001	1.18%	YES	1.30%
29	2-Propylfuran	8	8765-D1	0.000012	0.001	1.22%	YES	1.30%
29	2-Propylfuran	10	8765-E1	0.000012	0.001	1.24%	YES	1.30%
29	2-Propylfuran	12	8765-F1	0.000012	0.001	1.24%	YES	1.30%
29	2-Propylfuran	14	8765-G1	0.000012	0.001	1.22%	YES	1.30%
29	2-Propylfuran	16	8765-H1	0.000012	0.001	1.22%	YES	1.30%
29	2-Propylfuran	2	8765-A2	0.000008	0.001	0.80%	YES	1.30%
29	2-Propylfuran	4	8765-B2	0.000008	0.001	0.77%	YES	1.30%
29	2-Propylfuran	6	8765-C2	0.000008	0.001	0.77%	YES	1.30%
29	2-Propylfuran	8	8765-D2	0.000008	0.001	0.78%	YES	1.30%
29	2-Propylfuran	10	8765-E2	0.000008	0.001	0.79%	YES	1.30%
29	2-Propylfuran	12	8765-F2	0.000008	0.001	0.81%	YES	1.30%
29	2-Propylfuran	14	8765-G2	0.000008	0.001	0.79%	YES	1.30%
29	2-Propylfuran	16	8765-H2	0.000008	0.001	0.82%	YES	1.30%
29	2-Propylfuran	2	8766-A1	0.000012	0.001	1.16%	YES	1.30%
29	2-Propylfuran	4	8766-B1	0.000012	0.001	1.18%	YES	1.30%
29	2-Propylfuran	6	8766-C1	0.000008	0.001	0.84%	YES	1.30%
29	2-Propylfuran	8	8766-D1	0.000013	0.001	1.28%	YES	1.30%
29	2-Propylfuran	10	8766-E1	0.000013	0.001	1.28%	YES	1.30%
29	2-Propylfuran	12	8766-F1	0.000013	0.001	1.29%	YES	1.30%
29	2-Propylfuran	14	8766-G1	0.000013	0.001	1.30%	YES	1.30%
29	2-Propylfuran	16	8766-H1	0.000008	0.001	0.79%	YES	1.30%
29	2-Propylfuran	2	8766-A2	0.000008	0.001	0.76%	YES	1.30%
29	2-Propylfuran	4	8766-B2	0.000008	0.001	0.84%	YES	1.30%
29	2-Propylfuran	6	8766-C2	0.000013	0.001	1.27%	YES	1.30%
29	2-Propylfuran	8	8766-D2	0.000008	0.001	0.85%	YES	1.30%
29	2-Propylfuran	10	8766-E2	0.000009	0.001	0.86%	YES	1.30%
29	2-Propylfuran	12						1.30%
29	2-Propylfuran	14	8766-G2	0.000008	0.001	0.79%	YES	1.30%
29	2-Propylfuran	16	8766-H2	0.000013	0.001	1.30%	YES	1.30%
33	Diethylphthalate	2	8765-A1	0.00021	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	4	8765-B1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	6	8765-C1	0.00069	0.550148173	0.126%	YES	0.27%
33	Diethylphthalate	8	8765-D1	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	10	8765-E1	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	12	8765-F1	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	14	8765-G1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	16	8765-H1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	2	8765-A2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	4	8765-B2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	6	8765-C2	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	8	8765-D2	0.00020	0.550148173	0.037%	YES	0.27%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
33	Diethylphthalate	10	8765-E2	0.00045	0.550148173	0.082%	YES	0.27%
33	Diethylphthalate	12	8765-F2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	14	8765-G2	0.00146	0.550148173	0.265%	YES	0.27%
33	Diethylphthalate	16	8765-H2	0.00020	0.550148173	0.036%	YES	0.27%
33	Diethylphthalate	2	8766-A1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	4	8766-B1	0.00021	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	6	8766-C1	0.00021	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	8	8766-D1	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	10	8766-E1	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	12	8766-F1	0.00020	0.550148173	0.037%	YES	0.27%
33	Diethylphthalate	14						0.27%
33	Diethylphthalate	16	8766-H1	0.00020	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	2	8766-A2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	4	8766-B2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	6	8766-C2	0.00022	0.550148173	0.039%	YES	0.27%
33	Diethylphthalate	8						0.27%
33	Diethylphthalate	10	8766-E2	0.00021	0.550148173	0.038%	YES	0.27%
33	Diethylphthalate	12	8766-F2	0.00020	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	14	8766-G2	0.00019	0.550148173	0.035%	YES	0.27%
33	Diethylphthalate	16	8766-H2	0.00019	0.550148173	0.034%	YES	0.27%
34	Acetonitrile	2	8765-A1	0.0036	20	0.018%		0.0013%
34	Acetonitrile	4	8765-B1	0.0080	20	0.040%		0.0013%
34	Acetonitrile	6	8765-C1	0.0069	20	0.035%		0.0013%
34	Acetonitrile	8	8765-D1	0.0047	20	0.023%		0.0013%
34	Acetonitrile	10	8765-E1	0.0032	20	0.016%		0.0013%
34	Acetonitrile	12	8765-F1	0.0046	20	0.023%		0.0013%
34	Acetonitrile	14	8765-G1	0.0290	20	0.145%		0.0013%
34	Acetonitrile	16	8765-H1	0.0044	20	0.022%		0.0013%
34	Acetonitrile	2	8765-A2	0.1660	20	0.830%		0.0013%
34	Acetonitrile	4	8765-B2	0.0026	20	0.013%		0.0013%
34	Acetonitrile	6	8765-C2	0.0031	20	0.016%		0.0013%
34	Acetonitrile	8	8765-D2	0.0014	20	0.007%		0.0013%
34	Acetonitrile	10	8765-E2	0.0015	20	0.007%		0.0013%
34	Acetonitrile	12	8765-F2	0.0832	20	0.416%		0.0013%
34	Acetonitrile	14	8765-G2	0.0019	20	0.009%		0.0013%
34	Acetonitrile	16	8765-H2	0.0041	20	0.020%		0.0013%
34	Acetonitrile	2	8766-A1	0.0155	20	0.077%		0.0013%
34	Acetonitrile	4	8766-B1	0.2452	20	1.23%		0.0013%
34	Acetonitrile	6	8766-C1	0.0029	20	0.015%		0.0013%
34	Acetonitrile	8	8766-D1	0.0459	20	0.230%		0.0013%
34	Acetonitrile	10	8766-E1	0.0238	20	0.119%		0.0013%
34	Acetonitrile	12	8766-F1	0.0052	20	0.026%		0.0013%
34	Acetonitrile	14	8766-G1	0.0207	20	0.103%		0.0013%
34	Acetonitrile	16	8766-H1	0.0227	20	0.113%		0.0013%
34	Acetonitrile	2	8766-A2	1.1976	20	5.99%		0.0013%
34	Acetonitrile	4	8766-B2	0.0079	20	0.040%		0.0013%
34	Acetonitrile	6	8766-C2	0.0065	20	0.033%		0.0013%
34	Acetonitrile	8	8766-D2	0.0095	20	0.048%		0.0013%
34	Acetonitrile	10	8766-E2	0.0141	20	0.070%		0.0013%
34	Acetonitrile	12	8766-F2	0.0206	20	0.103%		0.0013%
34	Acetonitrile	14	8766-G2	0.0148	20	0.074%		0.0013%
34	Acetonitrile	16	8766-H2	0.0080	20	0.040%		0.0013%
35	Propanenitrile	2	8765-A1	0.00024	6	0.004%		0.004%
35	Propanenitrile	4	8765-B1	0.00025	6	0.004%		0.004%
35	Propanenitrile	6	8765-C1	0.00030	6	0.005%		0.004%
35	Propanenitrile	8	8765-D1	0.00029	6	0.005%		0.004%
35	Propanenitrile	10	8765-E1	0.00022	6	0.004%		0.004%
35	Propanenitrile	12	8765-F1	0.00027	6	0.004%		0.004%
35	Propanenitrile	14	8765-G1	0.00017	6	0.003%	YES	0.004%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
35	Propanenitrile	16	8765-H1	0.00024	6	0.004%		0.004%
35	Propanenitrile	2	8765-A2	0.00017	6	0.003%	YES	0.004%
35	Propanenitrile	4	8765-B2	0.00018	6	0.003%	YES	0.004%
35	Propanenitrile	6	8765-C2	0.00019	6	0.003%	YES	0.004%
35	Propanenitrile	8	8765-D2	0.00018	6	0.003%	YES	0.004%
35	Propanenitrile	10	8765-E2	0.00017	6	0.003%	YES	0.004%
35	Propanenitrile	12	8765-F2	0.00018	6	0.003%	YES	0.004%
35	Propanenitrile	14	8765-G2	0.00018	6	0.003%	YES	0.004%
35	Propanenitrile	16	8765-H2	0.00017	6	0.003%	YES	0.004%
35	Propanenitrile	2	8766-A1	0.00027	6	0.005%		0.004%
35	Propanenitrile	4	8766-B1	0.00022	6	0.004%		0.004%
35	Propanenitrile	6	8766-C1	0.00028	6	0.005%		0.004%
35	Propanenitrile	8	8766-D1	0.00029	6	0.005%		0.004%
35	Propanenitrile	10	8766-E1	0.00030	6	0.005%		0.004%
35	Propanenitrile	12	8766-F1	0.00026	6	0.004%		0.004%
35	Propanenitrile	14	8766-G1	0.00031	6	0.005%		0.004%
35	Propanenitrile	16	8766-H1	0.00028	6	0.005%		0.004%
35	Propanenitrile	2	8766-A2	0.00040	6	0.007%		0.004%
35	Propanenitrile	4	8766-B2	0.00022	6	0.004%	YES	0.004%
35	Propanenitrile	6	8766-C2	0.00022	6	0.004%	YES	0.004%
35	Propanenitrile	8	8766-D2	0.00021	6	0.003%	YES	0.004%
35	Propanenitrile	10	8766-E2	0.00022	6	0.004%	YES	0.004%
35	Propanenitrile	12	8766-F2	0.00023	6	0.004%	YES	0.004%
35	Propanenitrile	14	8766-G2	0.00023	6	0.004%	YES	0.004%
35	Propanenitrile	16	8766-H2	0.00019	6	0.003%	YES	0.004%
36	Butanenitrile	2	8765-A1	0.00010	8	0.001%	YES	0.003%
36	Butanenitrile	4	8765-B1	0.00014	8	0.002%		0.003%
36	Butanenitrile	6	8765-C1	0.00012	8	0.001%		0.003%
36	Butanenitrile	8	8765-D1	0.00014	8	0.002%		0.003%
36	Butanenitrile	10	8765-E1	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	12	8765-F1	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	14	8765-G1	0.00011	8	0.001%	YES	0.003%
36	Butanenitrile	16	8765-H1	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	2	8765-A2	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	4	8765-B2	0.00012	8	0.002%	YES	0.003%
36	Butanenitrile	6	8765-C2	0.00013	8	0.002%	YES	0.003%
36	Butanenitrile	8	8765-D2	0.00012	8	0.002%	YES	0.003%
36	Butanenitrile	10	8765-E2	0.00011	8	0.001%	YES	0.003%
36	Butanenitrile	12	8765-F2	0.00013	8	0.002%	YES	0.003%
36	Butanenitrile	14	8765-G2	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	16	8765-H2	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	2	8766-A1	0.00018	8	0.002%	YES	0.003%
36	Butanenitrile	4	8766-B1	0.00011	8	0.001%	YES	0.003%
36	Butanenitrile	6	8766-C1	0.00017	8	0.002%		0.003%
36	Butanenitrile	8	8766-D1	0.00012	8	0.001%	YES	0.003%
36	Butanenitrile	10	8766-E1	0.00015	8	0.002%		0.003%
36	Butanenitrile	12	8766-F1	0.00014	8	0.002%		0.003%
36	Butanenitrile	14	8766-G1	0.00013	8	0.002%		0.003%
36	Butanenitrile	16	8766-H1	0.00020	8	0.003%	YES	0.003%
36	Butanenitrile	2	8766-A2	0.00021	8	0.003%	YES	0.003%
36	Butanenitrile	4	8766-B2	0.00020	8	0.003%	YES	0.003%
36	Butanenitrile	6	8766-C2	0.00020	8	0.003%	YES	0.003%
36	Butanenitrile	8	8766-D2	0.00019	8	0.002%	YES	0.003%
36	Butanenitrile	10	8766-E2	0.00020	8	0.003%	YES	0.003%
36	Butanenitrile	12	8766-F2	0.00021	8	0.003%	YES	0.003%
36	Butanenitrile	14	8766-G2	0.00021	8	0.003%	YES	0.003%
36	Butanenitrile	16	8766-H2	0.00018	8	0.002%	YES	0.003%
37	Pentanenitrile	2	8765-A1	0.00011	6	0.002%	YES	0.007%
37	Pentanenitrile	4	8765-B1	0.00012	6	0.002%	YES	0.007%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL/RL?	Approx. DL/RL
37	Pentanenitrile	6	8765-C1	0.00012	6	0.002%	YES	0.007%
37	Pentanenitrile	8	8765-D1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	10	8765-E1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	12	8765-F1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	14	8765-G1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	16	8765-H1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	2	8765-A2	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	4	8765-B2	0.00014	6	0.002%	YES	0.007%
37	Pentanenitrile	6	8765-C2	0.00014	6	0.002%	YES	0.007%
37	Pentanenitrile	8	8765-D2	0.00014	6	0.002%	YES	0.007%
37	Pentanenitrile	10	8765-E2	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	12	8765-F2	0.00014	6	0.002%	YES	0.007%
37	Pentanenitrile	14	8765-G2	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	16	8765-H2	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	2	8766-A1	0.00018	6	0.003%	YES	0.007%
37	Pentanenitrile	4	8766-B1	0.00012	6	0.002%	YES	0.007%
37	Pentanenitrile	6	8766-C1	0.00043	6	0.007%		0.007%
37	Pentanenitrile	8	8766-D1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	10	8766-E1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	12	8766-F1	0.00013	6	0.002%	YES	0.007%
37	Pentanenitrile	14	8766-G1	0.00014	6	0.002%	YES	0.007%
37	Pentanenitrile	16	8766-H1	0.00021	6	0.003%	YES	0.007%
37	Pentanenitrile	2	8766-A2	0.00022	6	0.004%	YES	0.007%
37	Pentanenitrile	4	8766-B2	0.00021	6	0.003%	YES	0.007%
37	Pentanenitrile	6	8766-C2	0.00021	6	0.003%	YES	0.007%
37	Pentanenitrile	8	8766-D2	0.00020	6	0.003%	YES	0.007%
37	Pentanenitrile	10	8766-E2	0.00021	6	0.003%	YES	0.007%
37	Pentanenitrile	12	8766-F2	0.00022	6	0.004%	YES	0.007%
37	Pentanenitrile	14	8766-G2	0.00022	6	0.004%	YES	0.007%
37	Pentanenitrile	16	8766-H2	0.00018	6	0.003%	YES	0.007%
38	Hexanenitrile	2	8765-A1	0.00009	6	0.002%	YES	0.003%
38	Hexanenitrile	4	8765-B1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	6	8765-C1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	8	8765-D1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	10	8765-E1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	12	8765-F1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	14	8765-G1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	16	8765-H1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	2	8765-A2	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	4	8765-B2	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	6	8765-C2	0.00012	6	0.002%	YES	0.003%
38	Hexanenitrile	8	8765-D2	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	10	8765-E2	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	12	8765-F2	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	14	8765-G2	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	16	8765-H2	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	2	8766-A1	0.00015	6	0.003%	YES	0.003%
38	Hexanenitrile	4	8766-B1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	6	8766-C1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	8	8766-D1	0.00010	6	0.002%	YES	0.003%
38	Hexanenitrile	10	8766-E1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	12	8766-F1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	14	8766-G1	0.00011	6	0.002%	YES	0.003%
38	Hexanenitrile	16	8766-H1	0.00018	6	0.003%	YES	0.003%
38	Hexanenitrile	2	8766-A2	0.00019	6	0.003%	YES	0.003%
38	Hexanenitrile	4	8766-B2	0.00018	6	0.003%	YES	0.003%
38	Hexanenitrile	6	8766-C2	0.00018	6	0.003%	YES	0.003%
38	Hexanenitrile	8	8766-D2	0.00017	6	0.003%	YES	0.003%
38	Hexanenitrile	10	8766-E2	0.00018	6	0.003%	YES	0.003%
38	Hexanenitrile	12	8766-F2	0.00019	6	0.003%	YES	0.003%
38	Hexanenitrile	14	8766-G2	0.00019	6	0.003%	YES	0.003%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
38	Hexanenitrile	16	8766-H2	0.00016	6	0.003%	YES	0.003%
42	Ethylamine	2	8765-A1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	4	8765-B1	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	6	8765-C1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	8	8765-D1	0.1467	5	2.93%		0.10%
42	Ethylamine	10	8765-E1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8765-F1	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8765-G1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	16	8765-H1	0.1402	5	2.80%		0.10%
42	Ethylamine	2	8765-A2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	4	8765-B2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	6	8765-C2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	8	8765-D2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	10	8765-E2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8765-F2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	14	8765-G2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	16	8765-H2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	2	8766-A1	0.0044	5	0.09%	YES	0.10%
42	Ethylamine	4	8766-B1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	6	8766-C1	0.1221	5	2.44%		0.10%
42	Ethylamine	8	8766-D1	0.1375	5	2.75%		0.10%
42	Ethylamine	10	8766-E1	0.0960	5	1.92%		0.10%
42	Ethylamine	12	8766-F1	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	14	8766-G1	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	16	8766-H1	0.0043	5	0.09%	YES	0.10%
42	Ethylamine	2	8766-A2	0.0045	5	0.09%	YES	0.10%
42	Ethylamine	4	8766-B2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	6	8766-C2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	8	8766-D2	0.0047	5	0.09%	YES	0.10%
42	Ethylamine	10	8766-E2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	12	8766-F2	0.0046	5	0.09%	YES	0.10%
42	Ethylamine	14	8766-G2	0.0048	5	0.10%	YES	0.10%
42	Ethylamine	16	8766-H2	0.0046	5	0.09%	YES	0.10%
43	N-Nitrosodimethylamine	2	8765-A1	0.00854	0.0003	2845%		12.7%
43	N-Nitrosodimethylamine	4	8765-B1	0.01197	0.0003	3991%		12.7%
43	N-Nitrosodimethylamine	6	8765-C1	0.01374	0.0003	4579%		12.7%
43	N-Nitrosodimethylamine	8	8765-D1	0.01189	0.0003	3963%		12.7%
43	N-Nitrosodimethylamine	10	8765-E1	0.01377	0.0003	4589%		12.7%
43	N-Nitrosodimethylamine	12	8765-F1	0.01207	0.0003	4024%		12.7%
43	N-Nitrosodimethylamine	14	8765-G1	0.00146	0.0003	486%		12.7%
43	N-Nitrosodimethylamine	16	8765-H1	0.01099	0.0003	3662%		12.7%
43	N-Nitrosodimethylamine	2	8765-A2	0.00004	0.0003	12.4%	YES	12.7%
43	N-Nitrosodimethylamine	4	8765-B2	0.00004	0.0003	12.5%	YES	12.7%
43	N-Nitrosodimethylamine	6	8765-C2	0.00004	0.0003	12.5%	YES	12.7%
43	N-Nitrosodimethylamine	8	8765-D2	0.00004	0.0003	12.7%	YES	12.7%
43	N-Nitrosodimethylamine	10	8765-E2	0.00004	0.0003	12.7%	YES	12.7%
43	N-Nitrosodimethylamine	12	8765-F2	0.00004	0.0003	12.6%	YES	12.7%
43	N-Nitrosodimethylamine	14	8765-G2	0.00004	0.0003	12.3%	YES	12.7%
43	N-Nitrosodimethylamine	16	8765-H2	0.00004	0.0003	12.4%	YES	12.7%
43	N-Nitrosodimethylamine	2	8766-A1	0.00833	0.0003	2778%		12.7%
43	N-Nitrosodimethylamine	4	8766-B1	0.01084	0.0003	3613%		12.7%
43	N-Nitrosodimethylamine	6	8766-C1	0.01346	0.0003	4488%		12.7%
43	N-Nitrosodimethylamine	8	8766-D1	0.01087	0.0003	3624%		12.7%
43	N-Nitrosodimethylamine	10	8766-E1	0.00834	0.0003	2779%		12.7%
43	N-Nitrosodimethylamine	12	8766-F1	0.00859	0.0003	2863%		12.7%
43	N-Nitrosodimethylamine	14	8766-G1	0.00964	0.0003	3214%		12.7%
43	N-Nitrosodimethylamine	16	8766-H1	0.00628	0.0003	2095%		12.7%
43	N-Nitrosodimethylamine	2	8766-A2	0.00003	0.0003	8.37%	YES	12.7%
43	N-Nitrosodimethylamine	4	8766-B2	0.00002	0.0003	8.31%	YES	12.7%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
43	N-Nitrosodimethylamine	6	8766-C2	0.00002	0.0003	8.28%	YES	12.7%
43	N-Nitrosodimethylamine	8	8766-D2	0.00002	0.0003	8.29%	YES	12.7%
43	N-Nitrosodimethylamine	10	8766-E2	0.00002	0.0003	8.26%	YES	12.7%
43	N-Nitrosodimethylamine	12	8766-F2	0.00002	0.0003	8.21%	YES	12.7%
43	N-Nitrosodimethylamine	14	8766-G2	0.00002	0.0003	8.18%	YES	12.7%
43	N-Nitrosodimethylamine	16	8766-H2	0.00002	0.0003	7.95%	YES	12.7%
44	N-Nitrosodiethylamine	2	8765-A1	0.00004	0.0001	42.9%		25.7%
44	N-Nitrosodiethylamine	4	8765-B1	0.00006	0.0001	58.3%		25.7%
44	N-Nitrosodiethylamine	6	8765-C1	0.00005	0.0001	51.3%		25.7%
44	N-Nitrosodiethylamine	8	8765-D1	0.00002	0.0001	24.5%	YES	25.7%
44	N-Nitrosodiethylamine	10	8765-E1	0.00002	0.0001	24.4%	YES	25.7%
44	N-Nitrosodiethylamine	12	8765-F1	0.00002	0.0001	24.3%	YES	25.7%
44	N-Nitrosodiethylamine	14	8765-G1	0.00002	0.0001	23.9%	YES	25.7%
44	N-Nitrosodiethylamine	16	8765-H1	0.00002	0.0001	24.0%	YES	25.7%
44	N-Nitrosodiethylamine	2	8765-A2	0.00002	0.0001	24.8%	YES	25.7%
44	N-Nitrosodiethylamine	4	8765-B2	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodiethylamine	6	8765-C2	0.00003	0.0001	25.1%	YES	25.7%
44	N-Nitrosodiethylamine	8	8765-D2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodiethylamine	10	8765-E2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodiethylamine	12	8765-F2	0.00003	0.0001	25.2%	YES	25.7%
44	N-Nitrosodiethylamine	14	8765-G2	0.00002	0.0001	24.6%	YES	25.7%
44	N-Nitrosodiethylamine	16	8765-H2	0.00002	0.0001	24.8%	YES	25.7%
44	N-Nitrosodiethylamine	2	8766-A1	0.00007	0.0001	69.4%		25.7%
44	N-Nitrosodiethylamine	4	8766-B1	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodiethylamine	6	8766-C1	0.00007	0.0001	70.8%		25.7%
44	N-Nitrosodiethylamine	8	8766-D1	0.00003	0.0001	25.1%	YES	25.7%
44	N-Nitrosodiethylamine	10	8766-E1	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodiethylamine	12	8766-F1	0.00002	0.0001	24.9%	YES	25.7%
44	N-Nitrosodiethylamine	14	8766-G1	0.00002	0.0001	24.7%	YES	25.7%
44	N-Nitrosodiethylamine	16	8766-H1	0.00002	0.0001	24.6%	YES	25.7%
44	N-Nitrosodiethylamine	2	8766-A2	0.00003	0.0001	25.7%	YES	25.7%
44	N-Nitrosodiethylamine	4	8766-B2	0.00003	0.0001	25.5%	YES	25.7%
44	N-Nitrosodiethylamine	6	8766-C2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodiethylamine	8	8766-D2	0.00003	0.0001	25.5%	YES	25.7%
44	N-Nitrosodiethylamine	10	8766-E2	0.00003	0.0001	25.4%	YES	25.7%
44	N-Nitrosodiethylamine	12	8766-F2	0.00003	0.0001	25.2%	YES	25.7%
44	N-Nitrosodiethylamine	14	8766-G2	0.00003	0.0001	25.1%	YES	25.7%
44	N-Nitrosodiethylamine	16	8766-H2	0.00002	0.0001	24.4%	YES	25.7%
45	N-Nitrosomethylethylamine	2	8765-A1	0.00022	0.0003	74.4%		9.93%
45	N-Nitrosomethylethylamine	4	8765-B1	0.00030	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	6	8765-C1	0.00027	0.0003	91.1%		9.93%
45	N-Nitrosomethylethylamine	8	8765-D1	0.00025	0.0003	81.8%		9.93%
45	N-Nitrosomethylethylamine	10	8765-E1	0.00030	0.0003	100%		9.93%
45	N-Nitrosomethylethylamine	12	8765-F1	0.00030	0.0003	101%		9.93%
45	N-Nitrosomethylethylamine	14	8765-G1	0.00004	0.0003	12.1%		9.93%
45	N-Nitrosomethylethylamine	16	8765-H1	0.00024	0.0003	80.5%		9.93%
45	N-Nitrosomethylethylamine	2	8765-A2	0.00003	0.0003	9.57%	YES	9.93%
45	N-Nitrosomethylethylamine	4	8765-B2	0.00003	0.0003	9.63%	YES	9.93%
45	N-Nitrosomethylethylamine	6	8765-C2	0.00003	0.0003	9.70%	YES	9.93%
45	N-Nitrosomethylethylamine	8	8765-D2	0.00003	0.0003	9.80%	YES	9.93%
45	N-Nitrosomethylethylamine	10	8765-E2	0.00003	0.0003	9.81%	YES	9.93%
45	N-Nitrosomethylethylamine	12	8765-F2	0.00003	0.0003	9.73%	YES	9.93%
45	N-Nitrosomethylethylamine	14	8765-G2	0.00003	0.0003	9.51%	YES	9.93%
45	N-Nitrosomethylethylamine	16	8765-H2	0.00003	0.0003	9.57%	YES	9.93%
45	N-Nitrosomethylethylamine	2	8766-A1	0.00018	0.0003	61.3%		9.93%
45	N-Nitrosomethylethylamine	4	8766-B1	0.00030	0.0003	99.7%		9.93%
45	N-Nitrosomethylethylamine	6	8766-C1	0.00032	0.0003	106%		9.93%
45	N-Nitrosomethylethylamine	8	8766-D1	0.00027	0.0003	90.0%		9.93%
45	N-Nitrosomethylethylamine	10	8766-E1	0.00021	0.0003	69.8%		9.93%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
45	N-Nitrosomethylethylamine	12	8766-F1	0.00022	0.0003	72.3%		9.93%
45	N-Nitrosomethylethylamine	14	8766-G1	0.00023	0.0003	75.6%		9.93%
45	N-Nitrosomethylethylamine	16	8766-H1	0.00022	0.0003	73.2%		9.93%
45	N-Nitrosomethylethylamine	2	8766-A2	0.00003	0.0003	9.93%	YES	9.93%
45	N-Nitrosomethylethylamine	4	8766-B2	0.00003	0.0003	9.86%	YES	9.93%
45	N-Nitrosomethylethylamine	6	8766-C2	0.00003	0.0003	9.83%	YES	9.93%
45	N-Nitrosomethylethylamine	8	8766-D2	0.00003	0.0003	9.84%	YES	9.93%
45	N-Nitrosomethylethylamine	10	8766-E2	0.00003	0.0003	9.81%	YES	9.93%
45	N-Nitrosomethylethylamine	12	8766-F2	0.00003	0.0003	9.74%	YES	9.93%
45	N-Nitrosomethylethylamine	14	8766-G2	0.00003	0.0003	9.71%	YES	9.93%
45	N-Nitrosomethylethylamine	16	8766-H2	0.00003	0.0003	9.43%	YES	9.93%
46	N-Nitrosomorpholine	2	8765-A1	0.00005	0.0006	7.98%		3.61%
46	N-Nitrosomorpholine	4	8765-B1	0.00018	0.0006	29.8%		3.61%
46	N-Nitrosomorpholine	6	8765-C1	0.00020	0.0006	32.9%		3.61%
46	N-Nitrosomorpholine	8	8765-D1	0.00018	0.0006	30.1%		3.61%
46	N-Nitrosomorpholine	10	8765-E1	0.00018	0.0006	29.8%		3.61%
46	N-Nitrosomorpholine	12	8765-F1	0.00020	0.0006	32.7%		3.61%
46	N-Nitrosomorpholine	14	8765-G1	0.00004	0.0006	7.16%		3.61%
46	N-Nitrosomorpholine	16	8765-H1	0.00007	0.0006	11.4%		3.61%
46	N-Nitrosomorpholine	2	8765-A2	0.00002	0.0006	3.47%	YES	3.61%
46	N-Nitrosomorpholine	4	8765-B2	0.00002	0.0006	3.50%	YES	3.61%
46	N-Nitrosomorpholine	6	8765-C2	0.00002	0.0006	3.52%	YES	3.61%
46	N-Nitrosomorpholine	8	8765-D2	0.00002	0.0006	3.56%	YES	3.61%
46	N-Nitrosomorpholine	10	8765-E2	0.00002	0.0006	3.56%	YES	3.61%
46	N-Nitrosomorpholine	12	8765-F2	0.00002	0.0006	3.53%	YES	3.61%
46	N-Nitrosomorpholine	14	8765-G2	0.00002	0.0006	3.45%	YES	3.61%
46	N-Nitrosomorpholine	16	8765-H2	0.00002	0.0006	3.47%	YES	3.61%
46	N-Nitrosomorpholine	2	8766-A1	0.00005	0.0006	8.94%		3.61%
46	N-Nitrosomorpholine	4	8766-B1	0.00017	0.0006	27.6%		3.61%
46	N-Nitrosomorpholine	6	8766-C1	0.00019	0.0006	31.4%		3.61%
46	N-Nitrosomorpholine	8	8766-D1	0.00014	0.0006	23.7%		3.61%
46	N-Nitrosomorpholine	10	8766-E1	0.00005	0.0006	8.37%		3.61%
46	N-Nitrosomorpholine	12	8766-F1	0.00003	0.0006	4.57%		3.61%
46	N-Nitrosomorpholine	14	8766-G1	0.00002	0.0006	3.93%		3.61%
46	N-Nitrosomorpholine	16	8766-H1	0.00002	0.0006	3.45%	YES	3.61%
46	N-Nitrosomorpholine	2	8766-A2	0.00002	0.0006	3.61%	YES	3.61%
46	N-Nitrosomorpholine	4	8766-B2	0.00002	0.0006	3.59%	YES	3.61%
46	N-Nitrosomorpholine	6	8766-C2	0.00002	0.0006	3.58%	YES	3.61%
46	N-Nitrosomorpholine	8	8766-D2	0.00002	0.0006	3.58%	YES	3.61%
46	N-Nitrosomorpholine	10	8766-E2	0.00002	0.0006	3.57%	YES	3.61%
46	N-Nitrosomorpholine	12	8766-F2	0.00002	0.0006	3.54%	YES	3.61%
46	N-Nitrosomorpholine	14	8766-G2	0.00002	0.0006	3.53%	YES	3.61%
46	N-Nitrosomorpholine	16	8766-H2	0.00002	0.0006	3.43%	YES	3.61%
47	Tributyl phosphate	2	8765-A1	0.00014	0.2	0.071%	YES	0.487%
47	Tributyl phosphate	4	8765-B1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	6	8765-C1	0.00046	0.2	0.232%	YES	0.487%
47	Tributyl phosphate	8	8765-D1	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	10	8765-E1	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	12	8765-F1	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	14	8765-G1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	16	8765-H1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	2	8765-A2	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	4	8765-B2	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	6	8765-C2	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	8	8765-D2	0.00014	0.2	0.068%	YES	0.487%
47	Tributyl phosphate	10	8765-E2	0.00030	0.2	0.151%	YES	0.487%
47	Tributyl phosphate	12	8765-F2	0.00013	0.2	0.066%	YES	0.487%
47	Tributyl phosphate	14	8765-G2	0.00097	0.2	0.487%	YES	0.487%
47	Tributyl phosphate	16	8765-H2	0.00013	0.2	0.067%	YES	0.487%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL|RL?	Approx. DL|RL
47	Tributyl phosphate	2	8766-A1	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	4	8766-B1	0.00014	0.2	0.071%	YES	0.487%
47	Tributyl phosphate	6	8766-C1	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	8	8766-D1	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	10	8766-E1	0.00014	0.2	0.069%	YES	0.487%
47	Tributyl phosphate	12	8766-F1	0.00013	0.2	0.067%	YES	0.487%
47	Tributyl phosphate	14						0.487%
47	Tributyl phosphate	16	8766-H1	0.00013	0.2	0.065%	YES	0.487%
47	Tributyl phosphate	2	8766-A2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	4	8766-B2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	6	8766-C2	0.00014	0.2	0.072%	YES	0.487%
47	Tributyl phosphate	8						0.487%
47	Tributyl phosphate	10	8766-E2	0.00014	0.2	0.070%	YES	0.487%
47	Tributyl phosphate	12	8766-F2	0.00013	0.2	0.065%	YES	0.487%
47	Tributyl phosphate	14	8766-G2	0.00013	0.2	0.064%	YES	0.487%
47	Tributyl phosphate	16	8766-H2	0.00012	0.2	0.062%	YES	0.487%
48	Dibutyl butylphosphonate	2	8765-A1	0.00010	0.007	1.39%	YES	9.5%
48	Dibutyl butylphosphonate	4	8765-B1	0.00010	0.007	1.37%	YES	9.5%
48	Dibutyl butylphosphonate	6	8765-C1	0.00032	0.007	4.53%	YES	9.5%
48	Dibutyl butylphosphonate	8	8765-D1	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	10	8765-E1	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	12	8765-F1	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	14	8765-G1	0.00010	0.007	1.36%	YES	9.5%
48	Dibutyl butylphosphonate	16	8765-H1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	2	8765-A2	0.00009	0.007	1.31%	YES	9.5%
48	Dibutyl butylphosphonate	4	8765-B2	0.00009	0.007	1.31%	YES	9.5%
48	Dibutyl butylphosphonate	6	8765-C2	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	8	8765-D2	0.00009	0.007	1.33%	YES	9.5%
48	Dibutyl butylphosphonate	10	8765-E2	0.00021	0.007	2.95%	YES	9.5%
48	Dibutyl butylphosphonate	12	8765-F2	0.00009	0.007	1.29%	YES	9.5%
48	Dibutyl butylphosphonate	14	8765-G2	0.00067	0.007	9.52%	YES	9.5%
48	Dibutyl butylphosphonate	16	8765-H2	0.00009	0.007	1.30%	YES	9.5%
48	Dibutyl butylphosphonate	2	8766-A1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	4	8766-B1	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	6	8766-C1	0.00010	0.007	1.40%	YES	9.5%
48	Dibutyl butylphosphonate	8	8766-D1	0.00009	0.007	1.32%	YES	9.5%
48	Dibutyl butylphosphonate	10	8766-E1	0.00009	0.007	1.35%	YES	9.5%
48	Dibutyl butylphosphonate	12	8766-F1	0.00009	0.007	1.32%	YES	9.5%
48	Dibutyl butylphosphonate	14						9.5%
48	Dibutyl butylphosphonate	16	8766-H1	0.00009	0.007	1.27%	YES	9.5%
48	Dibutyl butylphosphonate	2	8766-A2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	4	8766-B2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	6	8766-C2	0.00010	0.007	1.42%	YES	9.5%
48	Dibutyl butylphosphonate	8						9.5%
48	Dibutyl butylphosphonate	10	8766-E2	0.00010	0.007	1.38%	YES	9.5%
48	Dibutyl butylphosphonate	12	8766-F2	0.00009	0.007	1.27%	YES	9.5%
48	Dibutyl butylphosphonate	14	8766-G2	0.00009	0.007	1.26%	YES	9.5%
48	Dibutyl butylphosphonate	16	8766-H2	0.00009	0.007	1.22%	YES	9.5%
51	Pyridine	2	8765-A1	0.00029	1	0.029%	YES	0.036%
51	Pyridine	4	8765-B1	0.00038	1	0.038%		0.036%
51	Pyridine	6	8765-C1	0.00041	1	0.041%		0.036%
51	Pyridine	8	8765-D1	0.00040	1	0.040%		0.036%
51	Pyridine	10	8765-E1	0.00033	1	0.033%	YES	0.036%
51	Pyridine	12	8765-F1	0.00033	1	0.033%		0.036%
51	Pyridine	14	8765-G1	0.00032	1	0.032%	YES	0.036%
51	Pyridine	16	8765-H1	0.00032	1	0.032%	YES	0.036%
51	Pyridine	2	8765-A2	0.00033	1	0.033%	YES	0.036%
51	Pyridine	4	8765-B2	0.00034	1	0.034%	YES	0.036%
51	Pyridine	6	8765-C2	0.00036	1	0.036%	YES	0.036%

COPC #	Analyte	End Time (h)	Position	Conc. (ppm)	OEL (ppm)	Fraction of OEL	Measurement < DL | RL?	Approx. DL | RL
51	Pyridine	8	8765-D2	0.00034	1	0.034%	YES	0.036%
51	Pyridine	10	8765-E2	0.00031	1	0.031%	YES	0.036%
51	Pyridine	12	8765-F2	0.00035	1	0.035%	YES	0.036%
51	Pyridine	14	8765-G2	0.00033	1	0.033%	YES	0.036%
51	Pyridine	16	8765-H2	0.00032	1	0.032%	YES	0.036%
51	Pyridine	2	8766-A1	0.00034	1	0.034%		0.036%
51	Pyridine	4	8766-B1	0.00046	1	0.046%		0.036%
51	Pyridine	6	8766-C1	0.00034	1	0.034%	YES	0.036%
51	Pyridine	8	8766-D1	0.00040	1	0.040%		0.036%
51	Pyridine	10	8766-E1	0.00034	1	0.034%		0.036%
51	Pyridine	12	8766-F1	0.00043	1	0.043%		0.036%
51	Pyridine	14	8766-G1	0.00036	1	0.036%		0.036%
51	Pyridine	16	8766-H1	0.00038	1	0.038%		0.036%
51	Pyridine	2	8766-A2	0.00025	1	0.025%	YES	0.036%
51	Pyridine	4	8766-B2	0.00024	1	0.024%	YES	0.036%
51	Pyridine	6	8766-C2	0.00024	1	0.024%	YES	0.036%
51	Pyridine	8	8766-D2	0.00022	1	0.022%	YES	0.036%
51	Pyridine	10	8766-E2	0.00024	1	0.024%	YES	0.036%
51	Pyridine	12	8766-F2	0.00025	1	0.025%	YES	0.036%
51	Pyridine	14	8766-G2	0.00025	1	0.025%	YES	0.036%
51	Pyridine	16	8766-H2	0.00021	1	0.021%	YES	0.036%
52	2,4-Dimethylpyridine	2	8765-A1	0.00018	0.5	0.037%	YES	0.054%
52	2,4-Dimethylpyridine	4	8765-B1	0.00019	0.5	0.039%	YES	0.054%
52	2,4-Dimethylpyridine	6	8765-C1	0.00019	0.5	0.038%	YES	0.054%
52	2,4-Dimethylpyridine	8	8765-D1	0.00021	0.5	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	10	8765-E1	0.00021	0.5	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	12	8765-F1	0.00021	0.5	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	14	8765-G1	0.00020	0.5	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	16	8765-H1	0.00021	0.5	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	2	8765-A2	0.00021	0.5	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	4	8765-B2	0.00022	0.5	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	6	8765-C2	0.00023	0.5	0.046%	YES	0.054%
52	2,4-Dimethylpyridine	8	8765-D2	0.00022	0.5	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	10	8765-E2	0.00020	0.5	0.040%	YES	0.054%
52	2,4-Dimethylpyridine	12	8765-F2	0.00022	0.5	0.045%	YES	0.054%
52	2,4-Dimethylpyridine	14	8765-G2	0.00021	0.5	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	16	8765-H2	0.00020	0.5	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	2	8766-A1	0.00022	0.5	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	4	8766-B1	0.00019	0.5	0.039%	YES	0.054%
52	2,4-Dimethylpyridine	6	8766-C1	0.00022	0.5	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	8	8766-D1	0.00021	0.5	0.041%	YES	0.054%
52	2,4-Dimethylpyridine	10	8766-E1	0.00021	0.5	0.043%	YES	0.054%
52	2,4-Dimethylpyridine	12	8766-F1	0.00021	0.5	0.042%	YES	0.054%
52	2,4-Dimethylpyridine	14	8766-G1	0.00022	0.5	0.044%	YES	0.054%
52	2,4-Dimethylpyridine	16	8766-H1	0.00025	0.5	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	2	8766-A2	0.00026	0.5	0.053%	YES	0.054%
52	2,4-Dimethylpyridine	4	8766-B2	0.00025	0.5	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	6	8766-C2	0.00026	0.5	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	8	8766-D2	0.00024	0.5	0.048%	YES	0.054%
52	2,4-Dimethylpyridine	10	8766-E2	0.00026	0.5	0.051%	YES	0.054%
52	2,4-Dimethylpyridine	12	8766-F2	0.00027	0.5	0.054%	YES	0.054%
52	2,4-Dimethylpyridine	14	8766-G2	0.00027	0.5	0.054%	YES	0.054%
52	2,4-Dimethylpyridine	16	8766-H2	0.00022	0.5	0.045%	YES	0.054%

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 ~2.2% of its OEL. All inlet and outlet concentration measurements were below the DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

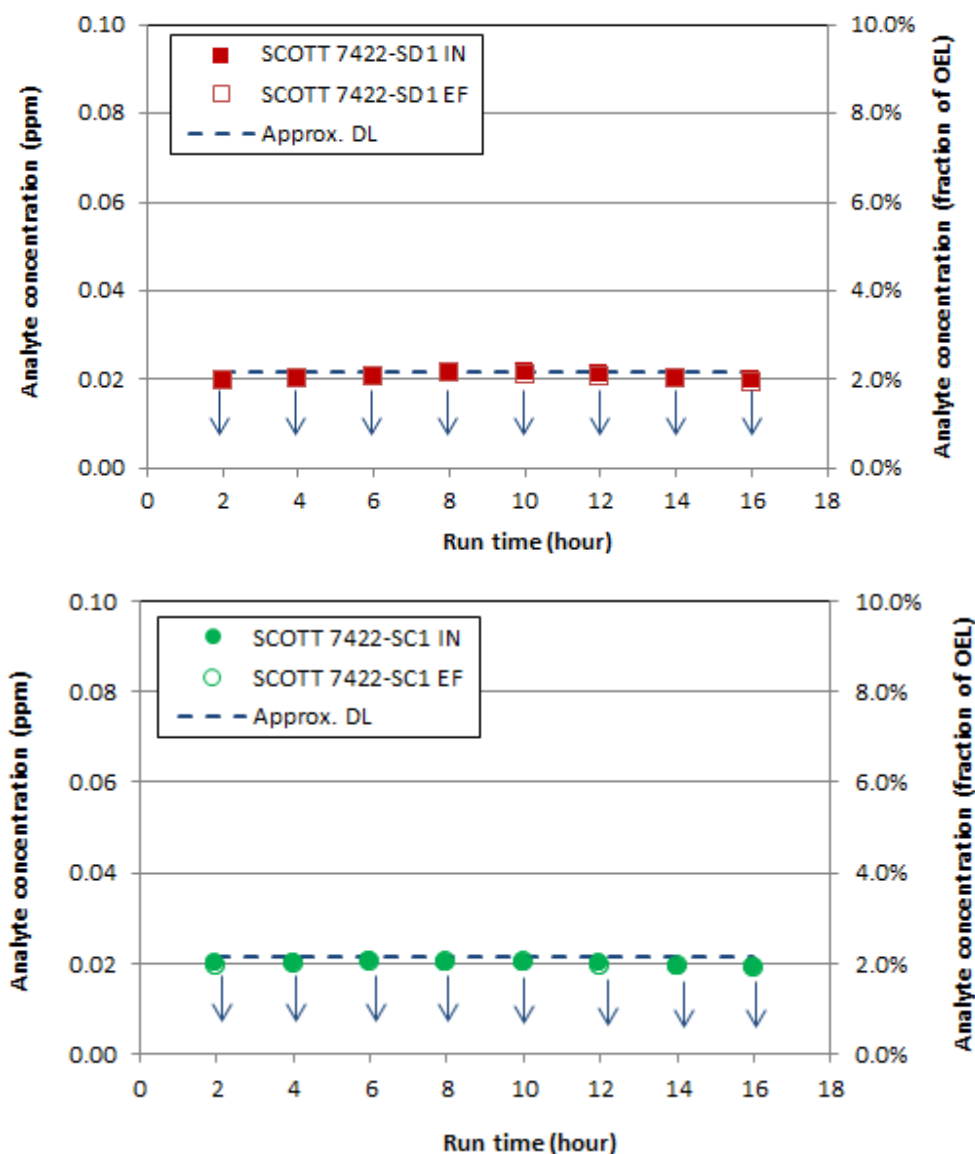


Figure E.1. Plot of Measured 1,3-Butadiene Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or reporting limit (RL). Outlet data points not visible are obscured by the inlet data points.

Formaldehyde (see Figure E.2) – The DL for formaldehyde corresponds to ~0.6% of its OEL. All inlet and outlet values measured for both respirator cartridges were <10% of the OEL; specifically, <4.4% of the OEL. The inlet concentrations for both cartridges decreased below 3% of the OEL after initial higher measurements early in each test. Outlet measurements for both cartridges were all less than or near the DL. This same trend was observed in prior tank analyses, suggesting possible environmental background interference, but this root cause still needs to be confirmed. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

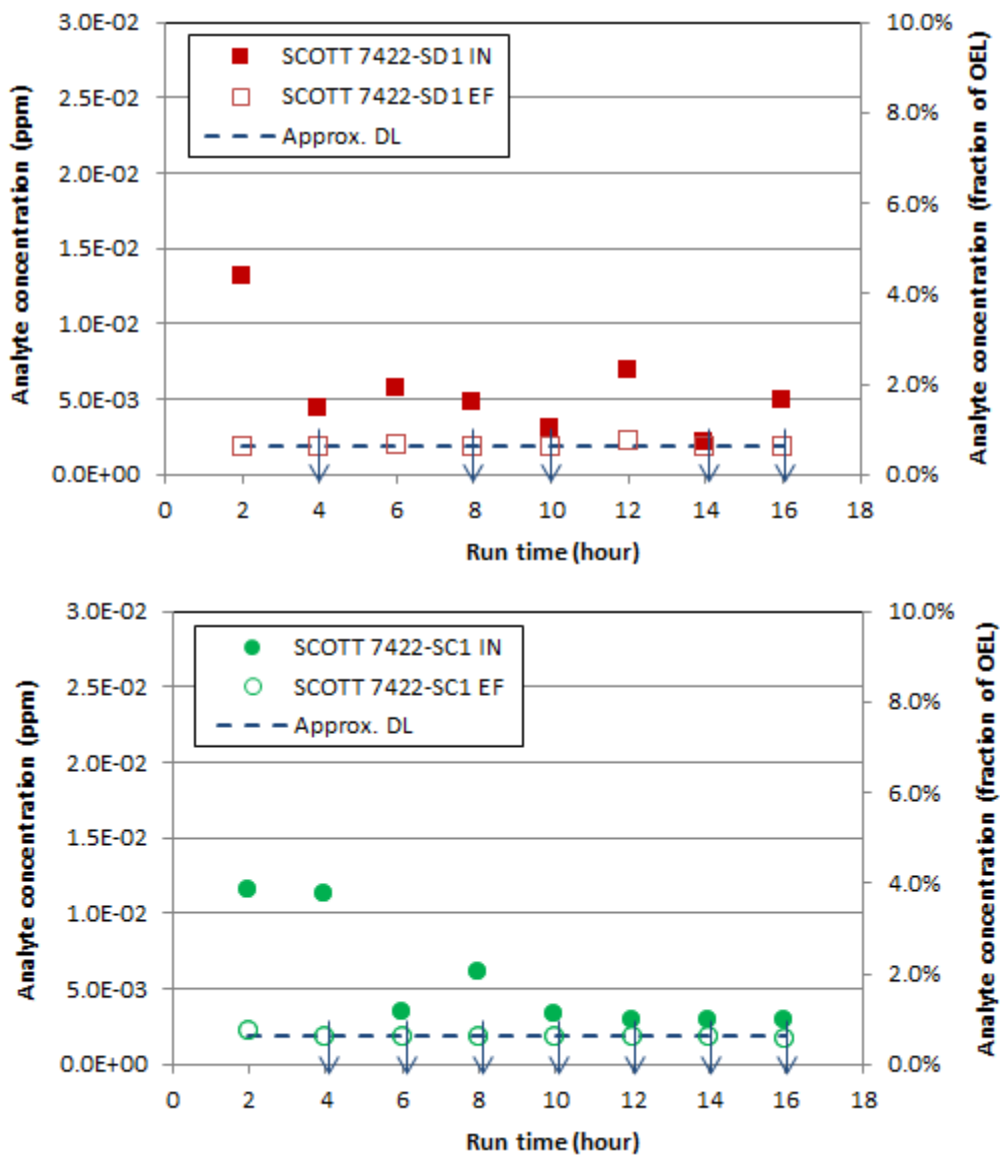


Figure E.2. Plot of Measured Formaldehyde Concentrations before the Inlets and after the Outlets of the two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Furan (see Figure E.3) – The DL for furan corresponds to ~5.8% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than the DL.²⁰ Inlet and outlet measurements for 6- and 16-hour sample periods for SCOTT 7422-SD1 cartridge testing indicate potential swapping or mislabeling of the sorbent tubes. This same pattern is repeated for all substituted furans, providing further evidence of a likely sample swap. Regardless, there is no evidence of breakthrough over the measured time period for either cartridge tested.

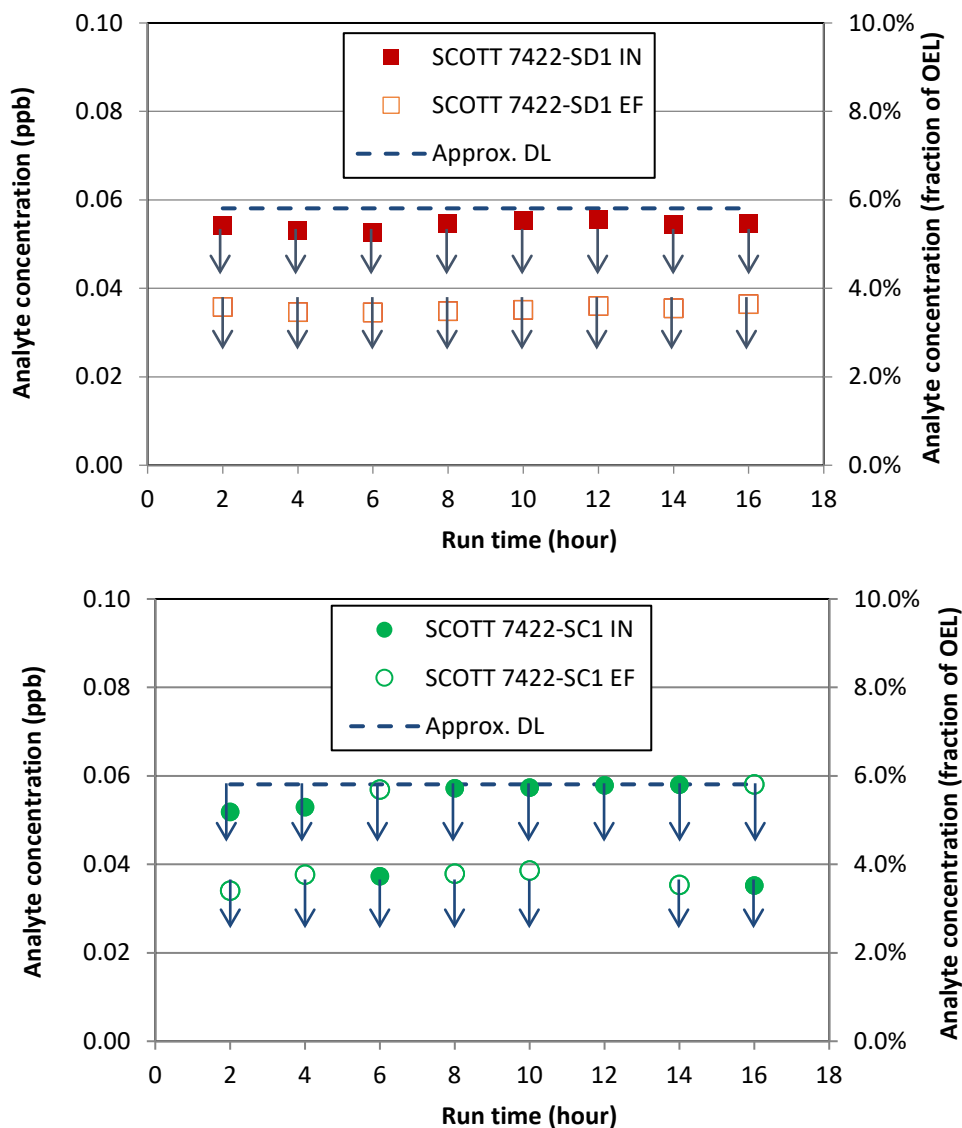


Figure E.3. Plot of Measured Furan Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

²⁰ Outlet concentrations for all furans for the 12-hour period (SCOTT 7422-SC1) were not recorded because of either a broken sorbent tube or analytical laboratory malfunction.

2,3-Dihydrofuran (see Figure E.4) – The DL for 2,3-dihydrofuran corresponds to ~3.1% of its OEL. All inlet and outlet values measured for the two respirator cartridges were less than the DL. Based on the data, there is no evidence of breakthrough over the measured time period for either cartridge tested.

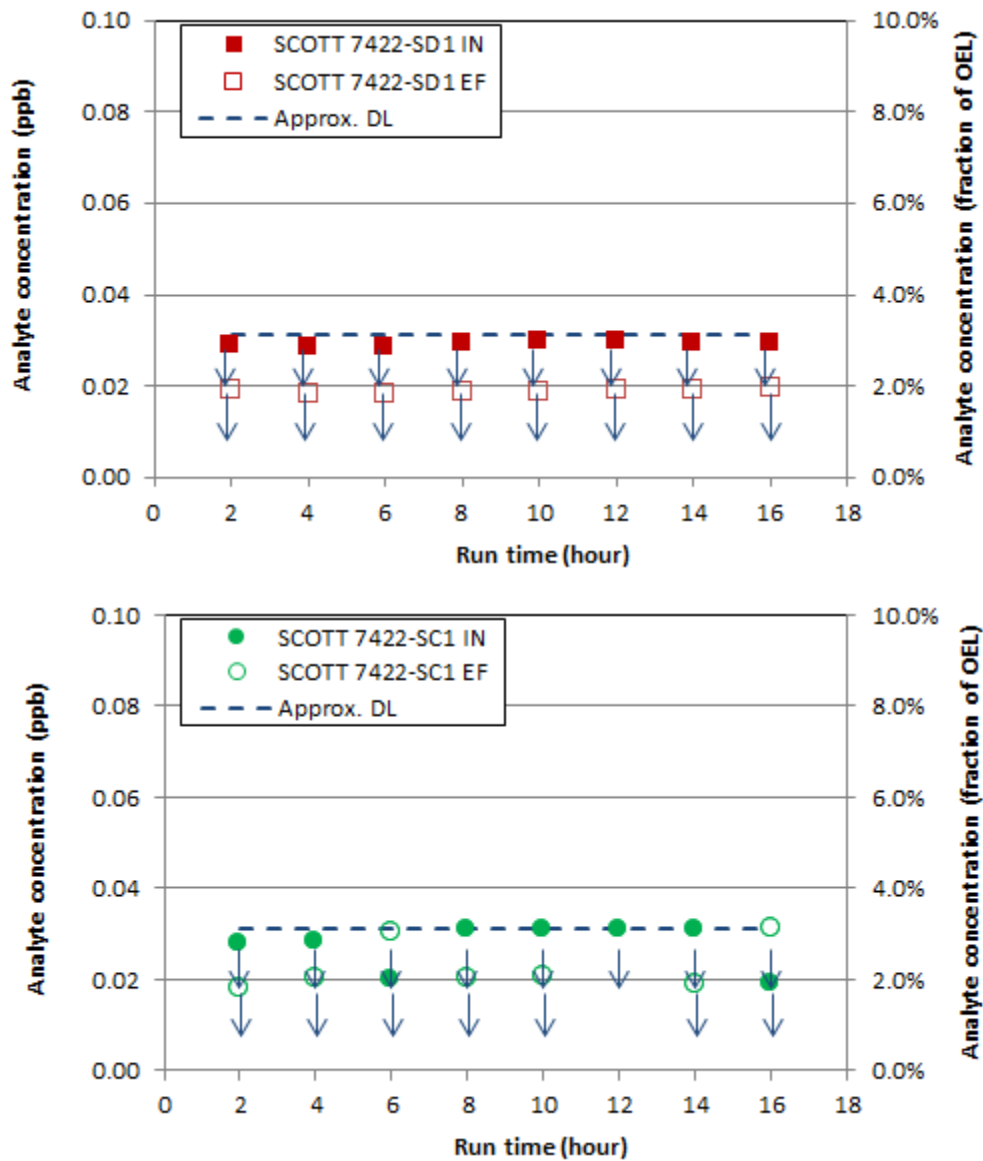


Figure E.4. Plot of Measured 2,3-Dihydrofuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

2-Pentylfuran (see Figure E.5) – The DL for 2-pentylfuran corresponds to ~2% of its OEL. All inlet and outlet measurements were <3.2% of the OEL. Only a few inlet or outlet measurements were above DL, including two inlet samples at 4 and 12 hours for SCOTT 7422-SD1, and both the inlet and outlet samples at 2 hours for SCOTT 7422-SC1. All of the outlet measurements were at or near the DL, and much <10% of the OEL. Therefore, there is no evidence of cartridge breakthrough for 2-pentylfuran.

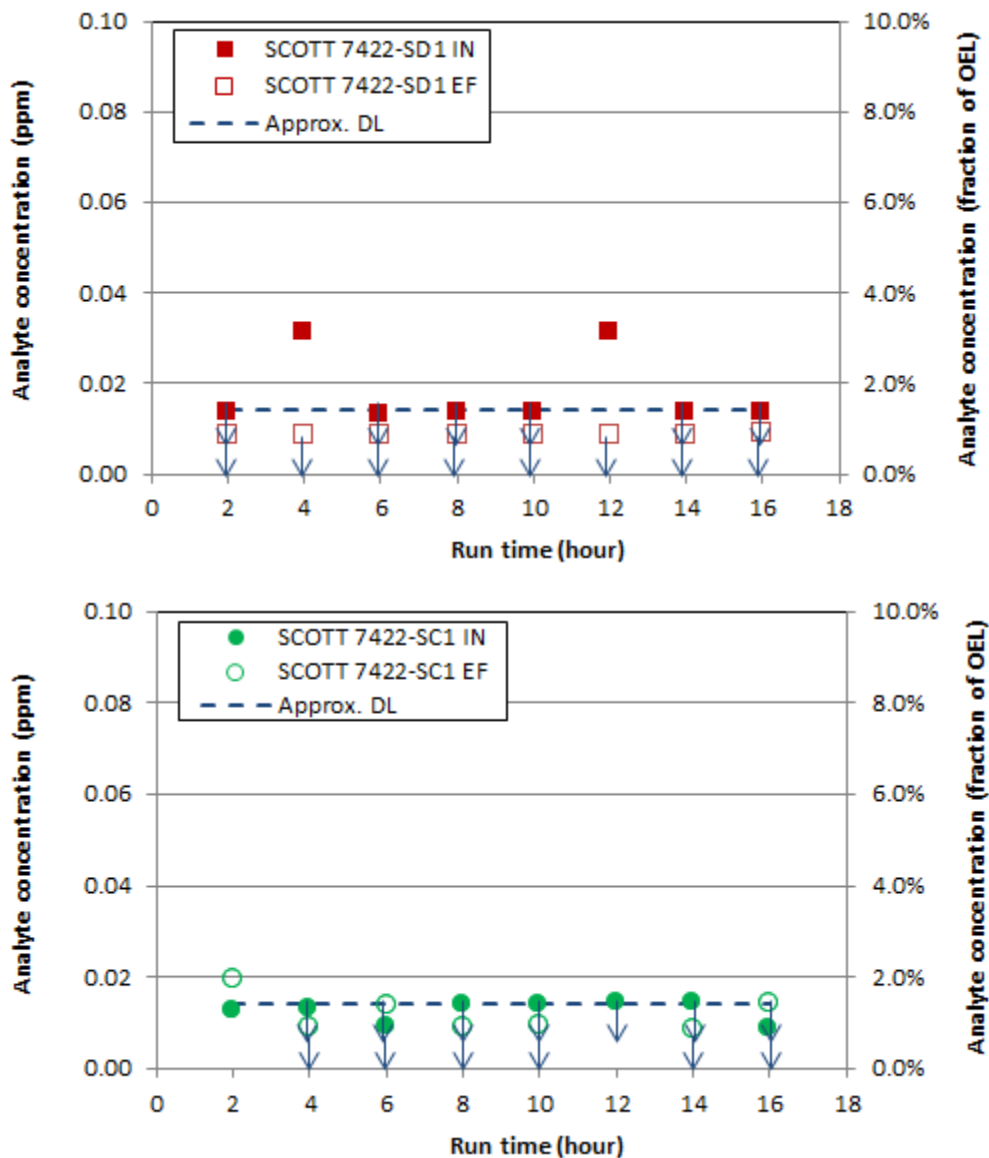


Figure E.5. Plot of Measured 2-Pentylfuran Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Acetonitrile (see Figure E.6) – The DL for acetonitrile corresponds to ~0.001% of its OEL. All inlet concentrations measured for both respirator cartridges had measurements greater than the DL, but <1.3% of the OEL. All outlet values measured for both respirator cartridges were <1% of the OEL, with the exception of the 2-hour sample for SCOTT 7422-SC-1 cartridge that measured nearly 6% of the OEL. This data point is suspicious because it has a corresponding inlet concentration that is much lower. All inlet and outlet values are <10% of the OEL, therefore there is no evidence of breakthrough above 10% over the measured time period for either cartridge tested.

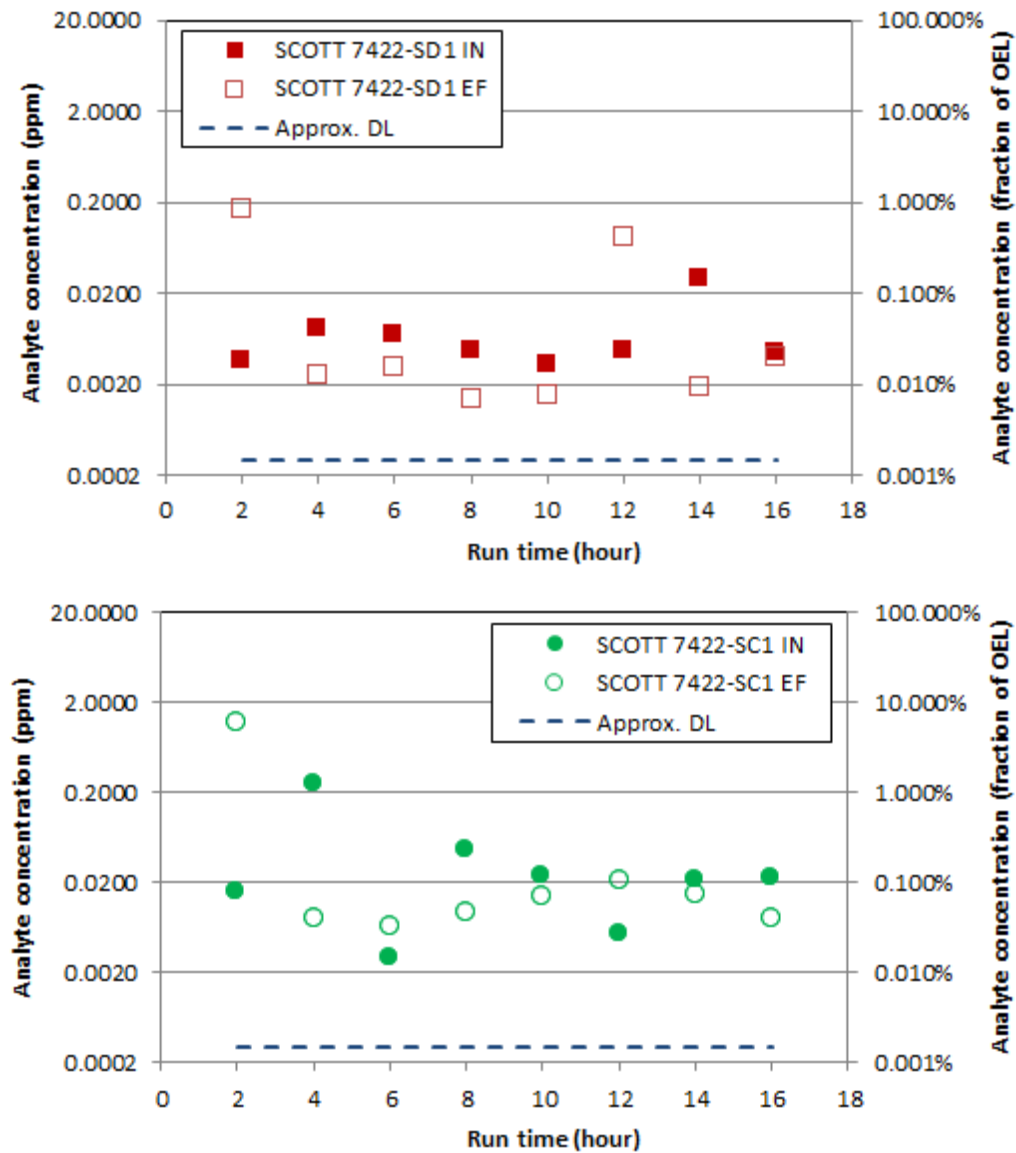


Figure E.6. Plot of Measured Acetonitrile Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL.

Ethylamine (see Figure E.7) – The DL for ethylamine corresponds to ~0.1% of its OEL. Only a few inlet or outlet measurements were above DL, including two inlet samples at 8 and 16 hours for SCOTT 7422-SD1, and three inlet samples from 6 to 10 hours for SCOTT 7422-SC1. All of these inlet measurements were <3% of the OEL. All outlet measurements were less than DL. Therefore, there is no evidence of cartridge breakthrough.

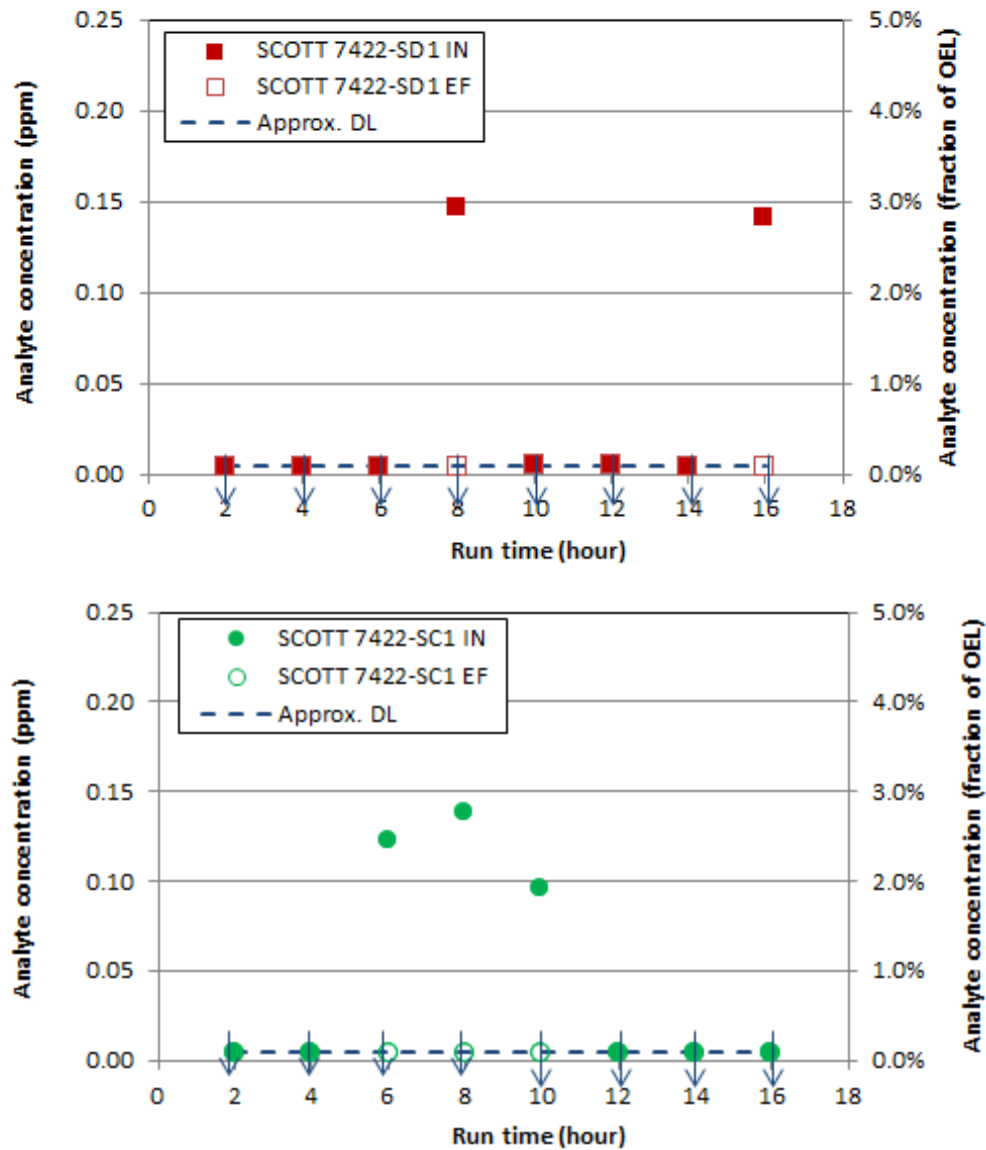


Figure E.7. Plot of Measured Ethylamine Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured by the inlet data points.

Dibutyl butylphosphonate (see Figure E.8) – The detection limit for dibutyl butylphosphonate corresponds to ~9.5% of its OEL. The DL is driven by three samples including two outlet measurements at 10 and 14 hours, and the inlet measurement at 6 hours for SCOTT 7422-SD1 cartridge. These three samples were all less than the DL but corresponded to concentrations >3% of the OEL. Each of these samples were flagged as suspect due to low flowrates for the sorbent tube sampling. All other inlet and outlet measurements were less than DL with corresponding concentrations <1.5% of the OEL. There is no evidence of cartridge breakthrough.

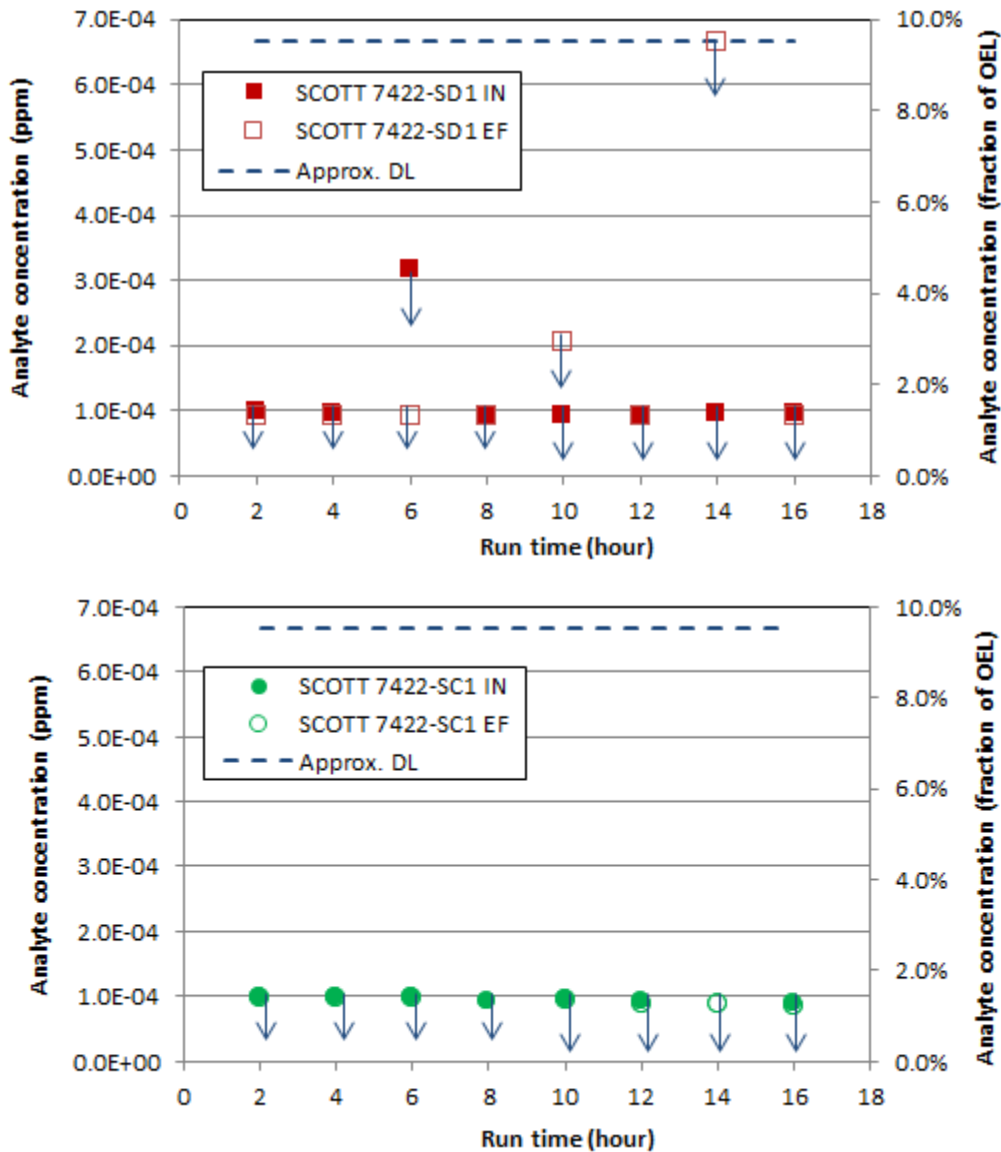


Figure E.8. Plot of Measured Dibutyl Butylphosphonate Concentrations before the Inlets and after the Outlets of the Two Respirator Cartridges Tested (SCOTT 7422-SD1 and SCOTT 7422-SC1). Data points noted with ↓ indicates measurements less than the DL or RL. Outlet data points not visible are obscured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

Appendix F

Historical Data Comparison

Appendix F

Historical Data Comparison

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 the AN Exhaust were obtained via a TWINS query on June 20, 2016, for TWINS HS⁽²¹⁾ and another query on December 21, 2016, for TWINS IH. More recent headspace data were also obtained from the Site-Wide Industrial Hygiene Database (SWIHD) by a query on December 21, 2016, that obtained all headspace data that were present as of that date, producing a set referred to as “SWIHD HS.”

TWINS HS and TWINS IH data were eliminated from consideration if they were

- Quality Assurance samples (blanks, laboratory control samples, or spikes)
- Marked as suspect (Data Qualifier flag S)
- Associated with a contaminant in a blank, trip blank, or field blank (Data Qualifier flags B, T, or F)
- A laboratory control sample that was out of range (Data Qualifier flag a)
- An excessive relative percent difference (Data Qualifier flag c)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (Data Qualifier flags L or Y).

Flags a, c, and L were found only in the TWINS IH database, not in TWINS HS.

The exclusions for the SWIHD HS data set were similar:

- Having a laboratory control sample that was out of range (flag a)
- Associated with a contaminant in a blank (flags b or B)
- Having an excessive relative percent difference or relative standard deviation (flags c or d)
- Having an excessive difference between the sample result and its serial dilution (flag e)
- Having a failed mass spectrometer reading on the sample but not on its serial dilution (flag f)
- Marked with a laboratory-defined flag whose meaning was not generically defined and might indicate a serious data-quality issue (flags L or Y).

TWINS HS results associated with chemicals that were ambiguously identified (e.g., “alkane,” “unknown,” “C6 ketone”) were deleted unless the molecular weight of one of the chemicals could be unambiguously specified (e.g., “octanenitrile and others” was kept). In these mixture cases, where the Chemical ID consisted of a Chemical Abstracts Service (CAS) number followed by M, the molecular weight of the identified chemical was added to the data record, the CAS number was used for the

²¹ No data have been added to TWINS HS since April 2005, so the June 2016 download does not require updating.

Chemical ID, and the concentration expressed in parts per million (absent from the downloaded database) was calculated from the concentration in milligrams per cubic meter at 25°C and the molecular weight.

A number of chemicals in the TWINS IH data set had “needs conversion” notes in the concentration (mg/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 atm were assumed.

The method described above was consistent with that used in PNNL-25880, except that measurements that were non-reports—less than the reporting limit (RL) for the analyte—were excluded in PNNL-25880 and were not excluded in this study.

For comparison to cartridge tests that were made using a gas stream from the AN Stack, only exhaust measurements were appropriate. The TWINS HS database contained data identified as having the location “AN Ventilation”, which were included as part of this analysis. The SWIHD HS database contained no data for the AN Stack. The TWINS IH database required sorting, as described below, so that only exhaust data were used.

The AN Farm data in the TWINS IH database that were used in analysis all had the location “Primary Exhauster” listed. Data where the location was an individual tank name, “CAM Cabinet”, or “Inside Farm” were not used. Survey titles for the “Inside Farm” location included descriptors such as “COPC” or “stack”. They may have been relevant to in-stack concentrations, but their apparent location made that unclear. Of the data with location “Primary Exhauster”, all were used except for those whose survey title included some form of the phrase “fan motor housing”. The data that were used almost all had “stack” or “train” somewhere in the survey title.

Maximum and average⁽²²⁾ exhaust concentrations were found for each analyte for the combined TWINS IH and SWIHD HS databases.⁽²³⁾ These maxima and averages are given in Table F.1^{24,25}, 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 to be not as representative of the vapors present during cartridge testing and the default was to omit them from calculations. However, in some cases the maximum and average for an analyte were considerably different if they were determined from a combination of all three databases. Whenever this was the case, the results for the three-database combination are tabulated along with those for the default two-database combination. That is, Table F.1 contains two rows for the chemical instead of one, with the upper row (the default two-database combination) in normal font and the lower row (the two-database combination) in italics. The two criteria

²² Arithmetic average

²³ Because the SWIHD HS database contained no stack data, the TWINS IH data were the only concentrations present in the two-database combination.

²⁴ Table F.1 does not include the recently updated furans data from the Carbotrap 300 TDU tube method. These data were developed in Freeman et.al.[19] Inlet concentrations for furan using the Carbotrap 300 TDU results were significantly higher than documented in this report although breakthrough was not observed on either cartridge. The inlet maximum using the Carbotrap 300 TDU method was 84.7% of the OEL for the 7422-SD1 cartridge and 77.5% for the 7422-SC1 cartridge. Furans measured on the effluent were all below detection limits indicating no breakthrough for either cartridge during the testing period. All inlet and effluent Carbotrap 300 TDU results for 2,5-dihydrofuran and 2-methylfuran were below detection limits.

²⁵ All % OEL values were calculated from concentration data that had been rounded to a minimum of three significant figures.

for tabulating this extra information were 1) that at least one concentration for the chemical exceeded the OEL, and 2) that there was a significant difference between the value obtained from the two-database combination and that from the three-database combination. The significant difference could be either that there were data for the three-database set but no data for the two-database set (i.e., data only in TWINS HS), or that there was a difference of a factor of three or more, in either direction, between the value obtained from the two-database combination and that from the three-database combination.

Because the RLs on concentrations in the historical database were generally higher than the reporting limits (RL) 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 all of the non-reports in the databases had concentrations equal to the measurements' RLs. Then the following rules were applied:

1. If a maximum value was a non-report, it was marked as "<RL" in the table.
2. If all the data contributing to an average were non-reports, the average was marked as "<RL".
3. If the presence of non-reports in an average caused it to be more than a factor of two different, in either direction, from the value it would have had if only the reported concentrations were averaged, the average was marked with an asterisk ("*").

Table F.1. COPC Comparison to Historical AN Tank Farms Exhauster Measurements

COPC Number and Name			Historical Measurements ¹					Measurements in this study						
			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)
Inorganic														
1	Ammonia	7664-41-7	-28	Poling et al., 2007 ²	25 ppm	37	134	46.4	536%	186%	130%	102%	35.0%	2.59% (RL)
2	Nitrous Oxide	10024-97-2	-127	Poling et al., 2007	50 ppm	4	27.6	19.7	55%	39.0%	Not Measured			
3	Mercury	7439-97-6	674	Poling et al., 2007	0.025 mg/m ³	26	0.456	0.05	1824%	200%	16.4%	11.2%	<RL	7.25% (RL)
Hydrocarbons														
4	1,3-Butadiene	106-99-0	24	Poling et al., 2007	1 ppm	36	<RL	<RL	<RL	<RL	<RL	<RL	<RL	2.15% (RL)
5	Benzene	71-43-2	176	Poling et al., 2007	0.5 ppm	37	<RL	<RL	<RL	<RL	0.063%	0.045%	<DL	0.027%
6	Biphenyl	92-52-4	491	Poling et al., 2007	0.2 ppm	23	0.0042	0.000479*	2.1%	0.24%*	<DL	<DL	<DL	0.60%
Alcohols														
7	1-Butanol	71-36-3	243	NIOSH	20 ppm	30	3.04	0.317	15%	1.6%	0.19%	0.14%	0.012%	0.004%
8	Methanol	67-56-1	148	Poling et al., 2007	200 ppm	15	<RL	<RL	<RL	<RL	Not Measured			
Ketones														
9	2-Hexanone	591-78-6	262	NIOSH	5 ppm	38	<RL	0.00228	<RL	0.05%	0.004%	0.003%	<DL	0.004%
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 Detected - TIC ¹²			
11	4-Methyl-2-hexanone	105-42-0	282	Predicted ACD/Labs ⁵	0.5 ppm	20	<RL	<RL	<RL	<RL	0.047%	0.021%	<DL	0.032%
12	6-Methyl-2-heptanone	928-68-7	333	Predicted ACD/Labs	8 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
13	3-Buten-2-one	78-94-4	179	CRC Handbook 1989	0.2 ppm	32	<RL	0.00178	<RL	0.89%	0.45%	0.19%	<DL	0.096%
Aldehydes														
14	Formaldehyde	50-00-0	-6	NIOSH	0.3 ppm	46	0.224	0.0358	75%	12%	4.37%	1.85%	0.74%	0.62% (RL)
15	Acetaldehyde	75-07-0	69	NIOSH	25 ppm	20	0.191	0.105	0.76%	0.42%	0.060%	0.052%	0.037%	0.005% (RL)
16	Butanal	123-72-8	167	Oxford safety data ⁶	25 ppm	53	<RL	0.0263*	<RL	0.11%*	0.002%	0.001%	0.001%	0.001%
17	2-Methyl-2-butenal	1115-11-3	244	United Nations ⁷	0.03 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			
18	2-Ethyl-hex-2-enal	645-62-5	347	Predicted ACD/Labs	0.1 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC			

Table F.1. (continued)

COPC Number and Name		CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements ¹					Measurements in this study				
						Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL ¹³ (%OEL)	
Furans															
19	Furan	110-00-9	88	Poling et al., 2007	1 ppb	50	<RL	1.88	<RL	188%	<DL	<DL	<DL	5.81%	
20	2,3-Dihydrofuran	1191-99-7	130	Alfa Aesar ⁸	1 ppb	18	0.405	0.169*	41%	17%*	<DL	<DL	<DL	3.11%	
21	2,5-Dihydrofuran	1708-29-8	152	Aldrich ⁹	1 ppb	50	<RL	<RL	<RL	<RL	10.7%	4.84%	<DL	4.38%	
22	2-Methylfuran	534-22-5	147	Oxford safety data	1 ppb	49	<RL	<RL	<RL	<RL	1.33%	1.14%	1.53%	1.25%	
23	2,5-Dimethylfuran	625-86-5	199	Alfa Aesar	1 ppb	18	<RL	<RL	<RL	<RL	<DL	<DL	<DL	1.84%	
24	2-Ethyl-5-methylfuran	1703-52-2	246	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
25	4-(1-Methylpropyl)-2,3-dihydrofuran	34379-54-9	328	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
26	3-(1,1-Dimethylethyl)-2,3-dihydrofuran	34314-82-4	306	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
27	2-Pentylfuran	3777-69-3	333	Alfa Aesar	1 ppb	18	<RL	<RL	<RL	<RL	3.11%	1.52%	1.97%	1.43%	
28	2-Heptylfuran	3777-71-7	410	Alfa Aesar	1 ppb	18	<RL	<RL	<RL	<RL	<DL	<DL	1.51%	1.56%	
29	2-Propylfuran	4229-91-8	231	Alfa Aesar	1 ppb	18	<RL	<RL	<RL	<RL	<DL	<DL	<DL	1.30%	
30	2-Octylfuran	4179-38-8	452	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
31	2-(3-Oxo-3-phenylprop-1-enyl)furan	717-21-5	605	Predicted ACD/Labs	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
32	2-(2-Methyl-6-oxoheptyl)furan	51595-87-0	Not available	Not available	1 ppb	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
Phthalates															
33	Diethylphthalate	84-66-2	563	NIOSH	5 mg/m ³	22	0.0289	0.00542	0.58%	0.11%	<DL	<DL	<DL	0.27%	

Table F.1. (continued)

COPC Number and Name		Historical Measurements ¹					Measurements in this study								
		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															
34	Acetonitrile	75-05-8	179	NIOSH	20 ppm	33	<RL	0.231*	<RL	1.2%*	1.23%	0.14%	5.99%	0.001%	
35	Propanenitrile	107-12-0	207	NIOSH	6 ppm	38	<RL	0.00211	<RL	0.04%	0.005%	0.004%	0.007%	0.004%	
36	Butanenitrile	109-74-0	244	NIOSH	8 ppm	36	<RL	0.00346	<RL	0.04%	0.002%	0.002%	<DL	0.003%	
37	Pentanenitrile	110-59-8	284	Alfa Aesar	6 ppm	38	<RL	0.0023	<RL	0.04%	0.007%	0.003%	<DL	0.007%	
38	Hexanenitrile	628-73-9	328	Predicted ACD/Labs	6 ppm	38	<RL	0.002	<RL	0.03%	<DL	<DL	<DL	0.003%	
39	Heptanenitrile	629-08-3	368	Alfa Aesar	6 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
40	2-Methylene butanenitrile	1647-11-6	Not available	Not available	0.3 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
41	2,4-Pentadienenitrile	1615-70-9	278	Predicted ACD/Labs	0.3 ppm	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
Amines															
42	Ethylamine	75-04-7	62	Poling et al., 2007	5 ppm	27	0.611	0.0842	12%	1.7%	2.94%	0.87%	<RL	0.096% (RL)	
Nitrosamines															
43	N-Nitrosodimethylamine	62-75-9	306	NIOSH	0.3 ppb	26	257	24.1	85667%	8033%	4589%	3350%	<RL	12.7% (RL)	
44	N-Nitrosodiethylamine	55-18-5	351	Oxford safety data	0.1 ppb	26	<RL	<RL	<RL	<RL	70.8%	35.2%	<RL	25.7% (RL)	
45	N-Nitrosomethylethylamine	10595-95-6	310	Predicted ACD/Labs	0.3 ppb	26	0.856	0.375	285%	125%	106%	80.5%	<RL	9.93% (RL)	
46	N-Nitrosomorpholine	59-89-2	435	Oxford safety data	0.6 ppb	26	0.407	0.167	68%	28%	32.9%	18.4%	<RL	3.61% (RL)	
Organophosphates															
47	Tributyl phosphate	126-73-8	552	NIOSH	0.2 ppm	23	<RL	0.000277*	<RL	0.14%*	<DL	<DL	<DL	0.49%	
48	Dibutyl butylphosphonate	78-46-6	602	Predicted ACD/Labs	0.007 ppm	22	<RL	<RL	<RL	<RL	<DL	<DL	<DL	9.52%	
Halogenated															
49	Chlorinated Biphenyls	Varies	Varies	Varies	1 mg/m ³	0	n/a	n/a	n/a	n/a	Not Detected - TIC				
50	2-Fluoropropene	1184-60-7	-11	SynQuest ¹¹	0.1 ppm	4	<RL	<RL	<RL	<RL	Not Detected - TIC				

Table F.1. (continued)

COPC Number and Name	CAS Number	Boiling Point (°F)	Boiling Point Source	Occupational Exposure Limit (OEL)	Historical Measurements ¹				Measurements in this study				
					Number of Values	Maximum Value	Average Value	Maximum Value (%OEL)	Average Value (%OEL)	Max Inlet (%OEL)	Avg. Inlet (%OEL)	Max outlet (%OEL)	Approx. DL ¹³ (%OEL)
Pyridines													
51	Pyridine	110-86-1	240	NIOSH	1 ppm	<RL	0.0554*	<RL	5.5%*	0.046%	0.036%	<RL	0.036% (RL)
52	2,4-Dimethylpyridine	108-47-4	318	Alfa Aesar	0.5 ppm	<RL	<RL	<RL	<RL	<RL	<RL	<RL	0.054% (RL)
Organonitriles													
53	Methyl nitrite	624-91-9	10	Oxford safety data	0.1 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
54	Butyl nitrite	544-16-1	172	Alfa Aesar	0.1 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
Organonitrates													
55	Butyl nitrate	928-45-0	276	Predicted ACD/Labs	2.5 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
56	1,4-Butanediol, dinitrate	3457-91-8	499	Predicted ACD/Labs	0.05 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
57	2-Nitro-2-methylpropane	594-70-7	260	Alfa Aesar	0.3 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
58	1,2,3-Propanetriol, 1,3-dinitrate	623-87-0	338	Predicted ACD/Labs	0.05 ppm	n/a	n/a	n/a	n/a	n/a	Not Detected - TIC		
Isocyanates													
59	Methyl isocyanate	624-83-9	103	NIOSH	0.02 ppm	<RL	<RL	<RL	<RL	<RL	Not Detected - TIC		

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

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.

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

"n/a" indicates that all pertinent measurements of the analyte were less than the reporting limit

Plain font in the table indicates that only the recent databases (SWIHD headspace and TWINS Industrial Hygiene) were included. Italics mean that the pre-2006 TWINS headspace data were also included.

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

² Poling, B. E.; Prausnitz, J. M.; O'Connell, J. P. *The Properties of Gases and Liquids*. McGraw Hill, 2007.

³ NIOSH: National Institute of Occupational Safety and Health

⁴ CRC Handbook of Chemistry and Physics, CRC Press, 1989.

⁵ ACD/Labs software <http://www.acdlabs.com/products/percepta/predictors.php>

⁶ Oxford safety data from The Physical and Theoretical Chemistry Laboratory at Oxford University

⁷ Food and Agriculture Organization of the United Nations

⁸ Alfa Aesar: <https://www.alfa.com/>

⁹ Aldrich: <https://www.sigmaaldrich.com/>

¹⁰ OSHA: Occupational Safety and Health Administration

¹¹ SynQuest: <http://synquestlabs.com/product/id/8330.html>

¹² TIC: Tentatively Identified Compounds that were not observed in this study using the specified analytical methods.

¹³ Approximate Detection Limit (DL) is calculated using the reported detection limit (or reporting limit) from the analytical laboratory and the average volume (from flowrate x time) of vapor exposed to the sorbent tube.

F.2 AN Exhaust: 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.

Two of seven AN Farm tanks with headspaces upstream of the AN stack—AN-101 and AN-106—have been active over the whole period of record. A number of waste transfers or exchanges took place between 2000 (when TWINS HS data were taken) and September 30, 2016, when cartridge testing began. These changes in waste contents have included receipts from C-100 and C-200 tanks and numerous interchanges within the A complex. The most recent activities, before cartridge testing, were in March 2016. Therefore, some of the waste present in the AN tanks during cartridge testing could be different from that present during earlier stack sampling. However, activities in tanks affecting the AN stack will continue, and there is no way to say that historical data could not apply to future stack concentrations. So, in the case of the AN stack, the fact that historical vapor concentrations came from different wastes will not be taken as a reason to consider the historical data irrelevant. However, it should also be noted that the AN Exhauster was changed to a higher flow system in August/September 2008,⁽²⁶⁾ so concentrations measured before that time would be expected to be higher than would be produced by the same waste if it were present after that time.

The larger discrepancies, or apparent discrepancies, between cartridge inlet and historical concentrations are discussed in the following sections.

F.2.1 Ammonia

The maximum cartridge inlet concentration of 130% of the OEL is low compared to the historical maximum concentration of 134 ppm (536% of the OEL). The highest above-report historical data consist of the following, in decreasing order of concentration:

- 134 ppm, March 27, 2006, survey title says nothing about disturbance – The Best Basis Inventory (BBI)²⁷ tank activity database indicates raw water was added to AN-106 during March 26–28, 2006, which includes the survey date.
- 116 ppm, October 18, 2006, survey title says nothing about disturbance – The BBI database indicates waste was transferred from C-204 to AN-106 during October 17–31, 2006, which includes the survey date.
- 104 ppm, July 21, 2005, survey title says nothing about disturbance – The BBI database indicates a waste transfer from C-202 to AN-106 during July 11–28, 2005, which includes the survey date.
- 84 ppm, August 24, 2012, survey title says nothing about disturbance – The BBI database indicates raw water was added to AN-106 during August 6–24, 2012, which includes the survey date. The most recent waste transfer had been from C-104 to AN-101 and had ended on August 17, 2012, which was 7 days before the survey.

²⁶ Email from RS Nicholson to JE Meacham, July 25, 2017; subject: “When the new AN Farm primary exhaust system came on line.”

²⁷ The Best-Basis Inventory (BBI) establishes the inventory of the underground waste storage tanks at Hanford by using sample data, process knowledge, surveillance data, and waste stream composition information from the Hanford Defined Waste (HDW) computer model (Agnew SF, J. Boyer, RA Corbin, TB Duran, JR FitzPatrick, KA Jurgensen, TP Ortiz, and BL Young. 1997. *Hanford Tank Chemical and Radionuclide Inventories: HDW Model Rev. 4*. LA-UR-96-3860, Los Alamos National Laboratory, Los Alamos, New Mexico).

The 2012 sample is the historical non-disturbance maximum, at 84 ppm (336% of the OEL). The cartridge inlet maximum is between 20% and 50% of the non-disturbance historical maximum and is not considered significant²⁸.

F.2.2 Nitrous Oxide

Nitrous oxide was not measured during cartridge testing. The historical data consist of the following four measurements, all above-reports, in decreasing order of concentration:

- 27.6 ppm and 26.1 ppm, August 23, 2006, survey title says nothing about disturbance – The BBI tank activity database indicates a waste transfer from C-103 to AN-106 on the survey date.
- 14.0 ppm, July 22, 2005, survey title says nothing about disturbance – The BBI database indicates a waste transfer from C-202 to AN-106 during July 11–28, 2005, which includes the survey date.
- 11.1 ppm, October 18, 2006, survey title refers to a transfer – The BBI database indicates a waste transfer from C-204 to AN-106 during October 17–31, 2006, which includes the survey date.

None of the surveys occurred during non-disturbed conditions. In addition, all of these concentrations were measured for the old lower-flow AN Exhauster system, and so may be high relative to current exhauster conditions.

F.2.3 Mercury

The maximum cartridge inlet concentration of 16% of the OEL is low compared to the historical maximum concentration of 0.456 mg/m³ (1824% of the OEL), and the average inlet concentration also is lower than historical data. The highest above-report historical data consist of the following, in decreasing order of concentration:

- 0.456 mg/m³, August 11, 2012, survey title includes “AN-106 to AP-104 Transfer” – The BBI tank activity database indicates raw water added to AN-106 during August 6–24, 2012, which includes the survey date, and a waste transfer from AN-106 to AP-104 on August 11, 2012, which also includes the survey date.
- 0.319 mg/m³, September 26, 2012, survey title includes “AN-106 to AP-104 Transfer” – The BBI database indicates waste was transferred from AN-106 to AP-104 during September 26–27, 2012, which includes the survey date.
- 0.116 mg/m³, September 13, 2013, survey title includes “baseline for AN-101 to AP-104” – The BBI database indicates waste was transferred between C-110 and AN-106 during September 10–26, 2013, which includes the survey date, and a waste transfer from AN-101 to C-101 during September 11–12, 2013, (1 day before the survey). In this case, the survey was a baseline for a subsequent transfer to AP-104 but was taken during a concurrent operation involving AN-106.
- 0.113 mg/m³, December 10, 2012, survey title includes “C-101 retrieval” – The BBI database indicates a waste transfer from C-101 to AN-101 during December 10–28, 2012, which includes the survey date.

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 >10% of the OEL and the maximum cartridge inlet concentration was <50% of the historical value. However, discrepancies are considered significant only if the maximum historical concentration was >10% of the OEL and the maximum cartridge inlet concentration is <20% of the historical value.

- 0.0778 mg/m³, June 13, 2014, survey title includes “C-105 post-transfer” – The BBI database indicates raw water was added to AN-106 during June 11–14, 2014, which includes the survey date, and waste was transferred from C-105 to AN-106 on June 11, 2014, (2 days before the survey, possibly not enough time for vapor generated by waste disturbance to clear from the headspace).
- 0.0586 mg/m³, August 10, 2012, survey title includes “baseline for AN-106 to AP-104” – The BBI database indicates raw water was added to AN-106 during August 6–24, 2012, which includes the survey date. The last previous waste transfer (AN-106 to C-107) ended on August 6, 2012, which was 4 days before the survey.

Extensive historical data, including one titled as baseline, were taken during waste transfers. The highest concentration for a sample with no evidence of concurrent or recent waste transfer was 0.0586 mg/m³ (234% of the OEL). The cartridge inlet maximum is <20% of the non-disturbance historical maximum and is considered significant.

F.2.4 1,3-Butadiene

The maximum cartridge inlet concentration of <2.1% of the OEL, which is below the DL, is low compared to the historical maximum concentration, an October 12, 2011, below-report datum that had an RL of 0.146 ppm (<15% of the OEL), although the average concentrations are acceptably close for historical and cartridge data. The maximum historical measurement came from a butadiene sample whose sample volume was not unusual. Most of the historical RLs are 0.05 ppm (5% of the OEL) or less. There are no above-report historical measurements. Because this chemical has no above-report historical data, no conclusion can be drawn about where its cartridge inlet concentrations lies with respect to historical data.

F.2.5 1-Butanol

The maximum cartridge inlet concentration of 0.19% of the OEL is low compared to the historical maximum concentration, which is 3.04 ppm (15% of the OEL). The historical maximum comes from one of three samples taken on August 23, 2006. The survey titles give no indication of disturbance; however, tank activity data in the BBI database show a waste transfer from C-103 to AN-106 on the survey date. In addition, this concentration was measured for the old lower-flow AN Exhauster system, and so it may be high relative to current exhauster conditions. Other historical above-report measurements, whether from disturbed conditions or not, are below 0.6 ppm (3% of the OEL). The cartridge maximum is consistent with the lower historical data.

F.2.6 Formaldehyde

The maximum cartridge inlet concentration of 4.4% of the OEL is low compared to the historical maximum concentration, which is 0.224 ppm (75% of the OEL). The highest above-report historical data consist of the following, in decreasing order of concentration:

- 0.224 ppm, December 10, 2012, survey title includes “C-101 retrieval” – The BBI database indicates a waste transfer from C-101 to AN-101 during December 10–28, 2012, which includes the survey date.
- 0.191 ppm, April 30, 2012, survey title includes “baseline” – The BBI database indicates raw water was added to AN-106 during April 2-22, 2012, which was 8 days before the survey date, and waste transferred from C-112 to AN-101 during April 2–18, 2012, which was 12 days before the survey date.

The non-disturbance historical maximum is 0.191 ppm (64% of the OEL). The cartridge inlet maximum inlet concentration was <20% of the non-disturbance historical maximum concentration.

F.2.7 Furan

The maximum cartridge inlet concentration of 84.7% of the OEL (measured by the Carbotrap 300 TDU method) is very low compared to the historical maximum concentration, an October 23, 2006 below-report datum that had an RL of 31.7 ppb (<3170% of the OEL). The sample volume for the below-report was 0.19 L, which is unusually low. The second-highest RL was 12 ppb (<1200% of the OEL) from a sample with 0.32 L volume taken on March 27, 2006. These unusually high <RL measurements account for the high average historical concentration as well.

There were eight above-report historical concentrations, the highest of which were the following, in decreasing order of concentration:

- 6.78 ppb, October 12, 2011, survey title includes “Transfer AN-101 to AP-104” – The BBI database indicates a waste transfer from C-107 to AN-106 during October 10–28, 2011, which includes the survey date, and a waste transfer from AN-101 to AP-104 during October 10–28, 2011, which also includes the survey date.
- 2.67 ppb, September 26, 2012, survey title includes “AN-106 to AP-104 Transfer” – The BBI database indicates a waste transfer from AN-106 to AP-104 during September 26–27, 2012, which includes the survey date.
- 1.20 ppb, October 31, 2013, survey title includes “baseline” – The BBI database indicates the last previous waste transfer was from C-110 to AN-106 during October 1-16, 2013 (ending 15 days before the survey date).

Of the eight above-report concentrations, 1.2 ppb (120% of the OEL) was the highest measurement for which there was no evidence of disturbance. The cartridge inlet maximum inlet concentration is not significantly less than the non-disturbance historical above-report maximum concentration.

F.2.8 2,3-Dihydrofuran

The maximum cartridge inlet concentration of <3.1% of the OEL, which is below the DL, is low compared to the historical maximum concentration of 0.405 ppb (41% of the OEL). This was the only above-report concentration, and it was measured on December 10, 2012 during a retrieval from C-101 to AN-101. There are no above-report historical measurements from non-disturbed conditions, so no conclusion can be drawn about where the cartridge inlet concentration lies with respect to historical data.

F.2.9 2,5-Dihydrofuran, 2-Methylfuran

The below-report historical maxima for these two chemicals come from the same 0.19 L sample that gave the maximum furan concentration. As in that case, the high <RL values contribute much of the historical average. Because these two chemicals have no above-report historical data, no conclusion can be drawn about where their cartridge inlet concentrations lie with respect to historical data.

F.2.10 2,5-Dimethylfuran, 2-Pentylfuran, 2-Heptylfuran, 2-Propylfuran

The below-report historical maxima for these two chemicals do not include any unusually high RLs. Because these chemicals have no above-report historical data, no conclusion can be drawn about where their cartridge inlet concentrations lie with respect to historical data.

F.2.11 N-Nitrosodimethylamine

The maximum cartridge inlet concentration of 4589% of the OEL is low compared to the historical maximum concentration of 257 ppb (85,700% of the OEL). This historical maximum was titled as a baseline measurement on September 23, 2011. The BBI activity database indicates that the last preceding activity, a waste transfer from AN-106 to AP-104, ended on August 31, 2011 (23 days before the survey). Therefore, this maximum is considered to reflect non-disturbance condition. The cartridge test maximum is <20% of the historical maximum.

F.2.12 N-Nitrosodiethylamine

The maximum cartridge inlet concentration of 71% of the OEL is low compared to the historical maximum concentration, a below-report with an RL of 0.179 ppb (<179% of the OEL). The sample volume was not unusually small, and there were four other samples with similar RLs. There are no above-report measurements. Because this chemical has no above-report historical data, no conclusion can be drawn about where its cartridge inlet concentration lies with respect to historical data.

F.2.13 N-Nitrosomethylethylamine

The maximum cartridge inlet concentration of 106% of the OEL is low compared to the historical maximum concentration, 0.856 ppb (285% of the OEL). There were a number of above-report historical concentrations, the highest of which were the following, in decreasing order of concentration:

- 0.856 ppb, December 29, 2011, survey title is “241-C-112 to AN-101 Post Start AN Farm COPC” – The BBI database indicates a waste transfer from AN-101 to C-112 during December 28–30, 2011, which includes the survey date.
- 0.770 ppb, August 29, 2011, survey title refers to a transfer baseline – The BBI database indicates a waste transfer from AN-106 to AP-104 during August 29–31, 2011. The transfer started on the survey date; although it is not stated that the baseline was taken before the transfer began, it seems likely.

The highest measurement for which there was no definite evidence of disturbance was 0.77 ppb (257% of the OEL). The cartridge inlet maximum inlet concentration is between 20% and 50% of the historical above-report maximum concentration and is not considered a significant discrepancy.

F.2.14 N-Nitrosomorpholine

The maximum cartridge inlet concentration of 33% of the OEL is low compared to the historical maximum concentration, 0.407 ppb (68% of the OEL). The sample was taken on August 11, 2012, and its survey title includes “baseline for AN-106 to AP-104.” However, the BBI database indicates raw water was added to AN-106 during August 6–24, 2012, which includes the survey date, and there was a waste transfer from AN-106 to AP-104 on August 11, 2012, the day of the survey. Although it is not stated that the baseline was taken before the transfer began, it seems likely. Hence this measurement is considered to be from non-disturbed conditions. The cartridge inlet maximum inlet concentration is between 20% and 50% of the historical above-report maximum concentration under non-disturbed conditions and is not considered a significant discrepancy.

F.2.15 Dibutyl butylphosphonate (DBBP)

The maximum cartridge inlet concentration of <2% of the OEL, which is below the DL (the RL is 10% of the OEL), is low compared to the historical maximum concentration, a below-report datum with an RL of 0.00121 ppm (17% of the OEL). Two samples, one from July 21, 2005, and the other from October 23, 2006, both had high RLs of about 0.0012 ppm. Their sample volumes were 1.2 L for the 2005 sample and 0.18 L for the 2006 sample. There are no above-report historical data for this chemical, so no conclusion can be drawn about where its cartridge inlet concentration lies with respect to historical data.

F.2.16 Pyridine

The maximum cartridge inlet concentration of <0.036% of the OEL, which is its RL, is low compared to the historical maximum concentration, a below-report datum that had an RL of 2.66 ppm (<266% of the OEL). The historical maximum came from a 2011 pyridines sample with a volume of 0.058 L, which is a very low volume that explains the high RL. The second-highest RL was 0.0186 ppm (<19% the OEL), and all other RLs were <0.007 ppm (<0.7% of the OEL). The unusually high <RL maximum accounts for the high average concentration as well. There were eight above-report concentrations in historical data, of which the highest was 0.015 ppm (0.15% of the OEL). Whether conditions did or did not include waste disturbance, the above-report historical concentrations are so low that there is no significant discrepancy. The cartridge test inlet concentrations are considered to be similar to the historical data.

F.2.17 2,4-Dimethylpyridine

The maximum and average historical concentrations are controlled by the RL from the same low-volume 2011 pyridines sample that produced the maximum RL for pyridine. Because this chemical has no above-report historical data, no conclusion can be drawn about where its cartridge inlet concentration lies with respect to historical data.

F.2.18 Methyl Isocyanate

This chemical was a tentatively identified compound at the inlet in cartridge testing. There is only one historical concentration, a below-report datum that had an RL of 0.007 ppm (<35% of the OEL). Given the scarcity of data, no conclusion can be drawn about where this chemical’s cartridge inlet concentration lies with respect to historical data.

F.2.19 Summary of Historical Data for the AN Exhaust

In summary, cartridge inlet concentrations for the AN Exhaust that were substantially lower than historical data can be described as follows:

- Differences arose from using historical data taken during waste disturbance for the historical maximum: ammonia, 1-butanol.
- Differences arose from using the RLs of below-report data for the historical maximum: pyridine.
- Differences arose from using data for vapor produced by a no-longer-existing inventory for the historical maximum: none.
- Differences could not be resolved because of the scarcity of non-disturbance above-report data: 1,3-butadiene, 2,3-dihydrofuran, 2,5-dihydrofuran, 2-methylfuran, 2,5-dimethylfuran, 2-pentylfuran, 2-heptylfuran, 2-propylfuran, N-nitrosodiethylamine, 2,4-dimethylpyridine, methyl isocyanate.
- Cartridge inlet concentrations were determined to be significantly lower than above-report historical concentrations: mercury, formaldehyde, N-nitrosodimethylamine.



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