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ADDENDUM 7 TO THE INDOOR AIR MONITORING REPORT

Lehigh Valley Railroad Derailment Superfund Site
Genesee, Monroe and Livingston Counties, New York
Index Number CERCLA-02-2006-2006

Prepared For:

LEHIGH VALLEY RAILROAD COMPANY
CINCINNATI, OHIO 45202

Prepared By:

Unicorn Management Consultants, LLC
52 Federal Road, Suite 2C
Danbury, CT 06810

Date
March 30, 2020

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DOCUMENT AUTHORIZATION FORM

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March 30, 2020

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Lehigh Valley Railroad Derailment Superfund Site

3/30/2020
Date

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1 INTRODUCTION

This document, "Addendum 7 to the Indoor Air Monitoring Report" (IAMP work performed during the 2019-2020 New York State Heating Season), was prepared by Unicorn Management Consultants, LLC (UMC) on behalf of the Lehigh Valley Railroad Company (LVRR) as an addendum to the Revised Draft Indoor Air Monitoring Report, dated July 12, 2013. The Revised Draft Indoor Air Monitoring Report was submitted to the United States Environmental Protection Agency (EPA) on July 19, 2013 (IAMP work performed between the 2007-2008 and 2012-2013 New York State Heating Seasons). A list of previously submitted addenda and other reports pertaining to the IAMP is included in Section 8 of this addendum.

LVRR is the respondent on the Settlement Agreement and Order on Consent for Pre-Remedial Design Investigations, Remedial Design, and Remedial Investigation/Feasibility Study, Index Number CERCLA-02-2006-2006 ("SA") for the Lehigh Valley Railroad Derailment Superfund Site located in Genesee, Monroe and Livingston Counties, near the Town of LeRoy, New York (the "Site"), which was issued by EPA, effective date October 6, 2006. Figure 1 shows the Site location.

The SA requires LVRR to implement the Final Work Plan for Remedial Investigation/Feasibility Study, prepared by Foster Wheeler Environmental Corporation (FWEC, 2002) and addendum, dated September 27, 2005 (FWEC, 2005) ("Work Plan"). Addendum 1 to the Work Plan required LVRR to prepare and implement an Indoor Air Monitoring Plan (IAMP) in accordance with EPA's *Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathways from Ground Water and Soils (*EPA, 2002) ("2002 EPA Guidance") and New York State Department of Health (NYSDOH) *Final Guidance for Evaluating Vapor Intrusion in the State of York* (2006) ("NYSDOH Guidance"). In June 2015, EPA released the OSWER Technical Guide for Assessing and Mitigating the Vapor Intrusion Pathway from Subsurface Vapor Sources to Indoor Air (EPA, 2015) ("2015 EPA Guidance") which supersedes and replaces the 2002 guidance.

The purpose of the IAMP was to determine if vapors of trichloroethene (TCE) and/or its degradation products (cis-1,2-dichloroethene, trans-1,2-dichloroethene, and vinyl chloride) were impacting indoor air quality in the Site vicinity. UMC, on behalf of LVRR, prepared and submitted a Final IAMP on March 14, 2008, and Amendments 1, 2, and 3 to the IAMP, which were approved by EPA on March 19, 2008 (UMC, 2008).

1.1 ADDENDUM 7 TO THE INDOOR AIR MONITORING REPORT

Addendum 7 includes descriptions of the work performed during the 2019-2020 New York State Heating Season (Sections 2 and 3); location specific discussions of soil gas air sample collection conducted in October 2019 and mitigation system O&M inspections conducted during February 2020 (Section 4); a discussion of the analytical data quality (Section 5); and a description of the additional work proposed for the 2020-2021 New York State Heating Season (Section 6).

Appendix A of this addendum includes redacted copies of UMC's September 16, 2019 letters notifying property owners of UMC's intent to perform the 2018-2019 New York State Heating Season work.

Appendix B to this addendum includes a copy of the G-07 Soil Gas Sampling Work Plan.

Appendix C to this addendum contains electronic copies of the analytical data reports and data validation reports for soil gas air samples collected from location G-07 in October 2019.

Appendix D to this addendum includes redacted copies of the mitigation system O&M inspection reports.

Appendix E to this addendum includes an excerpt from UMC's *Draft Feasibility Study Report*, dated June 5, 2019.

The details of indoor air monitoring activities conducted before the 2019-2020 New York State Heating Season can be found in the 2013 Indoor Air Monitoring Report and Addendums 1, 2, 3, 4, 5 and 6 to the Indoor Air Monitoring Report.

2 PROJECT DESCRIPTION

During the 2019-2020 New York State Heating Season, UMC continued to implement work associated with the IAMP as described previously in Section 6 of Addendum 6 to the Indoor Air Monitoring Report (submitted to EPA on March 27, 2019). UMC notified property owners of its intent to conduct this work in letters dated September 16, 2019. Redacted copies of the property owner notification letters are included in Appendix A of this addendum.

In May 2019, UMC requested permission from property owners to decommission a small number of existing private/domestic water supply wells located in the Site vicinity. The property associated with one of these wells, G-07, was originally selected for air quality testing during the 2009-2010 New York State Heating Season, however the property owner refused to grant UMC access to the property for the collection of indoor air samples. In May 2019, the property owner refused to grant UMC permission to abandon the private well. The property owner explained that the well was only used for landscaping purposes, and not as a potable water supply. UMC reviewed the historical TCE data for the private well and determined that despite its proximity to the TCE plume, the well was not impacted.

In September 2019, UMC returned to G-07 to request permission to collect a water sample from the well to confirm that the well was still unaffected by the TCE plume. In addition to the water sample, UMC also proposed the collection of a limited round of soil gas samples to assess the potential for vapor intrusion on the property. The property owner granted UMC permission to collect the water and soil gas samples from the soil adjacent to the house.

In October 2019, UMC returned to G-07 to collect the soil gas and water samples from the property. In total, UMC collected three air samples (1 soil gas sample, 1 duplicate soil gas sample, and 1 ambient air sample) and one water sample from the domestic well. UMC collected the soil gas samples in accordance with UMC's Interoffice Memo, *G-07 Soil Gas Sampling Work Plan*, dated October 10, 2019 (Soil Gas Sampling Work Plan). A copy of the Soil Gas Sampling Work Plan is included in Appendix B of this addendum. Although no indoor air samples were collected from the residence, UMC believes that the analytical results of these samples can inform decisions regarding the removal of G-07 from the IAMP. Copies of the analytical data reports and data validation reports for these samples are included in Appendix C of this addendum. Information regarding UMC's efforts to decommission existing private/domestic wells in the Site vicinity is included in the Draft LVRR Feasibility Study Report, dated June 5, 2019.

Additionally, in October 2019, UMC accompanied mitigation contractors (Mitigation Tech and Envirosafe Inspections) during the replacement of the blower fans installed at locations G-01, G-09, L-17, L-26, L-32, L-33, L-38, M-23, M-26, and M-35. The fans at these locations were replaced because they were nearing the end of their expected working lifespan (approximately 10-years).

In February 2020, UMC accompanied mitigation contractors (Mitigation Tech and Envirosafe Inspections) during the inspections of the mitigation systems installed at locations G-01, G-09, G-10, L-17, L-26, L-27, L-32, L-33, L-38, L-39, M-23, M-26, and M-35.

All mitigation activities conducted prior to and during the 2019-2020 New York State Heating Season were performed in accordance with the EPA approved QAPP, dated January 13, 2015.

Additionally, all work was performed in accordance with the EPA approved Site Health and Safety Plan.

As stated in Section 6.1.1 of Addendum 6 to the Indoor Air Monitoring Report, no locations were scheduled for periodic air sampling during the 2019-2020 New York State Heating Season.

3 SUMMARY OF IAMP ACTIVITIES

3.1 SOIL VAPOR INTRUSION AND INDOOR AIR QUALITY ASSESMENT

3.1.1 G-07 Soil Gas Sampling

On October 22-23, 2019, UMC collected certain environmental samples from the property associated with domestic well G-07. Specifically, UMC collected a single water sample from the existing domestic well, and conducted a limited round of soil gas sampling on the property in accordance with UMC's October 2019 Soil Gas Sampling Work Plan (included in Appendix B of this addendum).

On October 22, 2019, UMC arrived at G-07 and began the installation of the temporary soil gas probes necessary for the collection of soil gas samples from the property. As stated in the Work Plan, UMC's intent was to collect soil gas samples over a 24-hour period from a total of 5-locations on the property (with 1 ambient air sample and 1 duplicate sample). However, UMC was unable to advance enough boreholes of sufficient depth to achieve this target. UMC's Work Plan specified that a borehole with a minimum depth of 4-feet was necessary in order to accommodate the minimum 1-foot sand pack and 3-foot bentonite seal as recommended in Section 2.7.1 of the New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006 (Guidance).

UMC attempted to advance boreholes with a hand auger for the soil gas probes at 9 locations near the residence on the property (G07-01 to G07-09). At 8 locations, UMC encountered either a layer of 2 to 3-inch crushed stone, or large flat rocks (possibly bedrock) at depths of 0.8 to 1.6-feet below ground surface. At each location where UMC encountered these obstructions, a second attempt was made to advance a borehole approximately 6 to 12-inches further away from the residence. UMC encountered the same sub surface conditions resulting in refusal at similar depths during each of the second attempts. UMC backfilled each of the boreholes with the original soil.

UMC was only able to advance beyond 1.6-feet at 1 location situated approximately 10-feet from the eastern side of the residence (G07-04). At location G07-04, UMC encountered a layer of 2 to 3-inch crushed stones at a depth of 3-feet. Despite this borehole not meeting the minimum 4-foot recommendation, UMC still installed a soil gas probe with a 1-foot sand pack and a 2-foot bentonite seal. UMC then attached two Summa canisters with a "T"-fitting to this soil gas probe in order to collect 1 soil gas sample and 1 duplicate sample. UMC also set up a Summa cannister on a nearby tree stump located upwind from the installed soil gas probe in order to collect 1-ambient air sample. UMC then opened the valves on the Summa canisters to begin the sample collection process.

Prior to leaving the property for the day, UMC collected a single water sample from the domestic well on the property using the hose connected to the well. The well is only used for landscaping purposes, and not as a potable water supply. UMC let the hose run at full capacity for approximately 15-minutes prior to collecting the sample.

On October 23, 2019, UMC returned to the property approximately 24-hours after opening the Summa canister valves to collect the soil gas and ambient air samples. UMC also removed the soil gas probe and its bentonite seal from the borehole. UMC backfilled the borehole with the

original soil. UMC then inspected all the boreholes on the property and dressed them with a layer of fresh top soil and grass seed.

UMC shipped the air samples via FedEx to ALS Laboratories in Simi Valley, CA for low level VOC Analysis by EPA method TO-15. UMC hand delivered the domestic well sample to ALS Rochester for VOC analysis by EPA method 8260.

An analytical data report for the water sample was generated on October 29, 2019, and an analytical data report for the soil gas samples was generated on November 27, 2019. Data validation reports for both the water and soil gas samples were generated on December 16, 2019. Copies of the analytical data reports and data validation reports are included in Appendix C of this addendum.

Table 1 presents a summary of the testing performed at all sample locations between April 2008 and October 2019, TCE concentrations detected, and the Air Matrix 1 results (where applicable) for each phase of sampling. Table 2 presents all of the analytical data for air samples collected during the soil gas sampling activities conducted on October 2019.

3.1.2 SVI Mitigation System Fan Replacements

As stated in Section 6.3 of Addendum 6 to the Indoor Air Monitoring Report, many of the soil vapor intrusion (SVI) mitigation system blower fans were nearing the end of their expected working lifespan (approximately 10-years). Because of this, UMC planned to replace the blower fans installed at select locations on Site prior to the 2019-2020 New York State Heating Season.

On October 22-24, 2019, UMC accompanied mitigation contractors (Mitigation Tech and Envirosafe Inspections) during the replacement of the blower fans installed at locations G-01, G-09, L-17, L-26, L-32, L-33, L-38, M-23, M-26, and M-35. The fans at locations G-10 and L-27 were not replaced during this trip as they were previously replaced on March 25, 2015 and September 13, 2017 respectively. Neither fan at G-10 or L-27 have approached the end of their expected working lifespan. UMC will replace these fans closer to that time.

3.1.3 2019-2020 Heating Season O&M Inspections

On February 18-19, 2020, UMC accompanied mitigation contractors (Mitigation Tech and Envirosafe Inspections) during O&M inspections of mitigation systems previously installed in the buildings at locations G-01, G-09, G-10, L-17, L-26, L-27, L-32, L-33, L-38, M-23, M-26, and M-35. In addition, UMC accompanied Envirosafe Inspections during an inspection of the radon mitigation system installed at location L-39. The mitigation contractors found that all mitigation systems were operating without issue, except for the system at L-26. The property owner of L-26 reported a gurgling noise coming from the portion of the system installed in the attached garage. The mitigation contractor found that the gurgling was caused by condensation collecting in the pipe just below the fan, and adjusted the slop of the pipe to allow the trapped condensation to drain properly.

Both Mitigation Tech and Envirosafe Inspections produced reports for the inspections of the above SVI and radon mitigation systems. Copies of these reports have been included in Appendix B of this addendum.

3.1.4 2019-2020 Vapor Intrusion Sampling

As stated in Section 6.1.1 of Addendum 6 to the Indoor Air Monitoring Report, no locations were scheduled for periodic air sampling during the 2019-2020 New York State Heating Season. As Such UMC did not collect indoor air samples during this time period.

4 LOCATION SPECIFIC DETAILS OF IAMP ACTIVITIES

Results for the soil gas sampling and O&M inspections conducted by UMC at the Site are discussed below by property. The validated analytical data for air samples collected during the 2019-2020 New York State Heating Season are included on Tables 1 and 2 of this addendum. Copies of the laboratory analytical reports and the data validation reports are included in Appendix C of this addendum. TCE and its degradation products cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), and vinyl chloride (VC) are the VOCs of interest at the Site. VOCs other than TCE that were detected in the SVI samples and are included on Table 2. Sample results are given in micrograms per cubic meter (ug/m3). Electronic copies of the O&M inspection reports are included in Appendix D of this addendum.

4.1 LOCATION G-01

4.1.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.1.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.2 LOCATION G-07

4.2.1 Soil Gas Sample Collection

On October 23, 2019, UMC collected a soil gas air sample (with duplicate) and an outdoor air sample over a period of 24-hours. The Samples were labeled G07-04, DUP102319, and G07-OUTDOOR respectively. Analytical results for TCE were 0.11U µg/m3 in G07-04 (0.1U µg/m3 in DUP102319), and 0.19 µg/m3 in G07-OUTDOOR. No TCE degradation products were detected in the air samples. The concentration of TCE in the air samples did not exceed the EPA Vapor Intrusion Screening Levels (VISLs).

Concurrently with the soil gas sample collection, UMC also collected a sample of the water from the property's existing domestic well. The well is currently only used for landscaping purposes, and not as a potable water supply. The analytical results for the water sample showed no detections of TCE or any of its degradation products.

4.2.2 Current Status

Based on the results of the soil gas and water samples collected in October 2019, UMC concludes that the residence is highly unlikely to have any issues with vapor intrusion, and recommends that this property can be removed from the Site IAMP.

4.3 LOCATION G-09

4.3.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.3.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.4 LOCATION G-10

4.4.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 19, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.4.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.5 LOCATION L-17

4.5.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.5.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.6 LOCATION L-26

4.6.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 19, 2020. The property owner of L-26 reported a gurgling noise coming from the portion of the system installed in the attached garage. The mitigation contractor found that the gurgling was caused by condensation collecting in the pipe just below the fan, and adjusted the slop of the pipe to allow the trapped condensation to drain properly. The contractor found no other issues with the system. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.6.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.7 LOCATION L-27

4.7.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Envirosafe Inspections during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.7.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.8 LOCATION L-32

4.8.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Envirosafe Inspections during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the

system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.8.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.9 LOCATION L-33

4.9.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Envirosafe Inspections during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.9.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.10 LOCATION L-38

4.10.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.10.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.11 LOCATION L-39

4.11.1 2019-2020 SVI System O&M

The mitigation system at location L-39 was installed by the property owner in December 2010 to reduce concentrations of radon gas within the residence. Although the system was intended for radon mitigation, it also reduced the concentration of TCE in the indoor air to values below the

laboratory's detection limit. Concentrations of TCE should remain below the laboratory's detection limit as long as the system continues to operate without issue. To ensure the mitigation system continues to operate without issue, UMC accompanied personnel from Envirosafe Inspections during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.11.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.12 LOCATION M-23

4.12.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Envirosafe Inspections during an inspection of the installed SVI mitigation system on February 18, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.12.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.13 LOCATION M-26

4.13.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 19, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.13.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

4.14 LOCATION M-35

4.14.1 2019-2020 SVI System O&M

As a part of ongoing O&M, UMC accompanied personnel from Mitigation Tech during an inspection of the installed SVI mitigation system on February 19, 2020. The contractor found the system working properly. An electronic copy of the O&M inspection report for this location is included in Appendix B of this addendum.

4.14.2 Current Status

Based on the results of the O&M mitigation system inspection conducted in February 2019, UMC believes that the installed SVI mitigation system continues to maintain concentrations of TCE in the indoor air at levels below the EPA vapor intrusion screening levels (VISLs).

5 SUMMARY OF DATA QUALITY

5.1 DATA QUALITY OBJECTIVES

All sampling, analysis, data assessment, and monitoring were performed in accordance with the EPA approved Quality Assurance Project Plan (QAPP) for Sampling and Analysis of the Lehigh Valley Railroad Derailment Superfund Site, dated January 2015. Data Quality Objectives were achieved through compliance with NYSDOH sampling guidelines and the analytical procedures specified in the QAPPs. The quality of site data collected during implementation of the IAMP was evaluated qualitatively and quantitatively with regard to precision, accuracy, representativeness, comparability, completeness and sensitivity (PARCCS).

Precision: Relative Percent Differences (RPDs) were calculated for the field duplicate sample collected during the 2019-2020 New York State Heating Season; DUP102319, which was collocated with the G07-04 sample.

The precision between the co-located samples collected for target compounds (including TCE and degradation products) met the recommended less than or equal to 20 RPD as specified in the January 2015 QAPP.

Accuracy: Recoveries of all target compounds were within the specified acceptance limits of 70-130% except for chloromethane (65%). Analytical results for chloromethane in G07-04, DUP10231, and G07-OUTDOOR were qualified by the validator as estimated (UJ) due to the high recovery for this analyte in the associated LCS. No target compounds were detected in the laboratory method blank.

Representativeness: The samples collected from the Site are considered representative based on field sampling procedures; laboratory analytical procedures; and sample holding times being met, as defined in the applicable QAPPs.

Comparability: To the extent possible, consistent field procedures were used across sampling events to ensure comparable results were obtained. Results from the field duplicate samples indicate good comparability. Similar compounds and concentrations were detected above MDLs in sample/field duplicate pairs.

Completeness: No sample holding times were exceeded for any of the samples, adequate documentation was present, and no laboratory data was rejected by the data validator. The goal of 100% completeness was achieved for (all of the properties tested yielded valid data).

Sensitivity: The laboratory method detection limits were below applicable criteria.

5.2 DATA VALIDATION SUMMARY

ALS Environmental of Simi Valley, CA (ALS) prepared and analyzed the air samples collected by UMC in October 2019 in accordance with EPA Compendium Method TO-15, "Determination of Volatile Organic compounds in Air Collected in Specially-Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)." Analytical data and laboratory reports for these air samples were submitted to Trillium, Incorporated (Trillium) for data validation.

Data validation performed by Trillium was in conformance with EPA Region II Standard Operating Procedures HW-31 (REV. 6), "Analysis of Volatile Organic Compounds in Contained in Canisters by Method TO-15" (9/16) and the specifications of the EPA approved QAPP. The validated ALS sample data group (SDG) is identified as P1800286. Electronic copies of the data validation reports are included in Appendix C of this addendum.

5.2.1 Documentation

Chain of Custody: All samples were handled and delivered to the laboratory according to Chain of Custody (COC) procedures. According to the cooler receipt and preservation check form, the samples were hand delivered to the laboratory by the field team.

The air cans used for sampling were documented on the chain of custody record, the Post-Sampling Air Canister Pressure Check records, and the instrument run logs. Identifications of the flow controllers used were also documented on the chain of custody records.

Summa Canister Cleaning Certification: According to the laboratory's standard operation procedure for Method TO-15, used summa canisters are cleaned in batches at the laboratory. Within each batch of cleaned canisters, the canister that formerly contained the highest concentration of volatile organic compounds is selected for analysis. The selected canister is also leak tested prior to analysis. If no contaminants are detected in the selected cleaned canister at a concentration greater than 0.2 ppbv (1.26ppbv for acetone and 1.59ppbv for ethanol) and the cleaned canister passes the leak test, then all canisters in the batch are certified clean.

Analytical data certifying summa canister cleaning associated with all of the canisters used for sampling were provided by the laboratory. Data verified that no contamination was present in the quality control checks.

5.2.2 Holding Times, Preservation, and Sample Integrity

All sample analyses were performed within the holding times of thirty (30) days from the date of collection specified by the validation SOP. There is no required preservation for TO-15 method.

5.2.3 Laboratory Method Blank and Trip Blank

No target compounds in the laboratory method blank. No trip blanks were collected during October 2019.

5.2.4 Surrogate Recovery

Bromofluorobenzene, 1,2-dichloroethane-d_4, and toluene-d_8 were used as the surrogate compound for these analyses. Recoveries of the surrogate compound in all site and laboratory quality control sample analyses were within the laboratory-specified acceptance limits of 70-130%.

5.2.5 Laboratory Quality Control

Matrix Spike/Matrix Spike Duplicate: The TO-15 Method does not require a Matrix Spike/Matrix Spike Duplicate.

Laboratory Control Sample: All percent recoveries for the target compounds and relative percent differences (RPD) between paired LCS/LCSD recoveries were correctly calculated and

accurately reported. Recoveries of all target compounds were within the specified acceptance limits of 70-130% except for chloromethane (65%). Analytical results for chloromethane in G07-04, DUP10231, and G07-OUTDOOR were qualified by the validator as estimated (UJ) due to the high recovery for this analyte in the associated LCS.

Laboratory Duplicate: Laboratory duplicate analysis was performed on G07-04. The precision between the co-located samples for target compounds (including TCE and degradation products) met the recommended less than or equal to 25 RPD as specified in the January 2015 QAPP.

Field Duplicate: Sample DUP102319 was submitted as a field duplicate of G07-04. The precision between the co-located samples for target compounds (including TCE and degradation products) met the recommended less than or equal to 20 RPD as specified in the January 2015 QAPP.

5.2.6 Compound Quantitation and Reporting Limits

ALS's compound concentrations were correctly calculated and accurately reported for all sample analyses.

5.2.7 Tentatively Identified Compounds

Library searches of nontarget compounds were not performed for the samples in this data set.

5.3 DATA USABILITY

In summary, the results of the PARCCS evaluation shows that data quality indicators are acceptable, and the data obtained during this investigation is adequate for characterizing Site conditions, risk and performing VI determination. UMC considers the data to be of sufficient level of sensitivity to support the conclusions in this report.

6 SUMMARY OF ADDITIONAL WORK

6.1 ADDITIONAL MONITORING

6.1.1 Extended IAMP Monitoring

Extended monitoring during the 2020-2021 New York State Heating Season and beyond are addressed in Section 3.2.4.d of the *Draft Feasibility Study Report*, dated June 5, 2019 (Draft FSR). An excerpt from the Draft FSR containing Section 3.2.4.d is included in Appendix E of this addendum. As stated in the Draft FSR, UMC proposes to monitor the indoor air quality at locations G-01, G-09, G-10, L-17, L-26, L-27, L-32, L-33, L-38, M-23, M-26, and M-35. As such UMC proposes to collect indoor air samples from these locations twice over a 5-year period. At the end of the 5-year period, UMC will reevaluate the frequency of sample collection from these locations.

Also included in Section 3.2.4.d of the Draft FSR is UMC's proposal to follow the recommendations presented in AECOM's *Vapor Intrusion Evaluation Report*, dated July 12, 2017. Following AECOM's recommendations, UMC would continue to work with EPA and NYSDEC to obtain property access to and collect indoor air samples from five locations where access for indoor air sampling was previously refused (L-07, L-09, L-13, L-18, and Lx-01). UMC would also periodically reevaluate nine locations (DW-07, L-06, L-08, L-14, L-22, L-31, Lx-06, M-15, and M-24) to determine if any changes in land use conditions warrant indoor air sample collection.

This work is tentatively scheduled to begin during the 2020-2021 New York State Heating Season.

6.2 ANNUAL O&M AT MITIGATED LOCATIONS

UMC will schedule O&M inspections of mitigation systems at locations G-01, G-09, G-10, L-17, L-26, L-27, L-32, L-33, L-38, L-39, M-23, M-26, and M-35 during the 2020-2021 New York State Heating Season. This is to ensure that the systems are free from defect and functioning properly. During these inspections any issues with the system will be addressed and cracks will be sealed where necessary.

7 CONCLUSION

During the 2019-2020 New York State Heating Season, UMC continued performing work associated with the LVRR IAMP. This work included conducting O&M inspections at residences with previously installed SVI mitigation. Based on the results of the O&M mitigation system inspections conducted in February 2020, UMC believes that the installed SVI mitigation systems continue to maintain concentrations of TCE in the indoor air to levels below the EPA VISLs.

To date, sixty-one (61) locations have been included in the IAMP. Of those locations which were considered for sampling, thirty-five (35) have been sampled for SVI. Property owners of fifteen (15) of the locations have refused access for sample collection, and eleven (11) locations were removed from the plan for reasons as described in Section 4 of the Indoor Air Monitoring Report, dated July 2013, and in Section 4 of Addendum 2 to the Indoor Air Monitoring Report, dated July 2015.

Of the thirty-five (35) locations which were sampled, active sub-slab depressurization mitigation systems were installed at twelve (12) locations.

In addition to the work described above, UMC also conducted a round of soil gas sampling at location G-07 in October 2019. Concurrently with the soil gas sample collection, UMC also collected a sample of water from the domestic well on the property. Based on the validated analytical results of the soil gas and water samples collected in October 2019, UMC believes that the residence is highly unlikely to have any issues with vapor intrusion, and this property can be removed from the Site IAMP.

Overall, the IAMP work performed by UMC on behalf of LVRR between 2008 and 2020 has been successful in addressing concerns of TCE exposure via soil vapor intrusion in both residential and commercial structures in the Site vicinity.

8 REFERENCES

EPA 2002, *EPA Draft Guidance for Evaluating Vapor Intrusion to Indoor Air Pathway from Ground Water and Soils,* November, 2002

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UMC 03-2019, *Addendum 6 to the Indoor Air Monitoring Report,* Unicorn Management Consultants, LLC. March 27, 2019.

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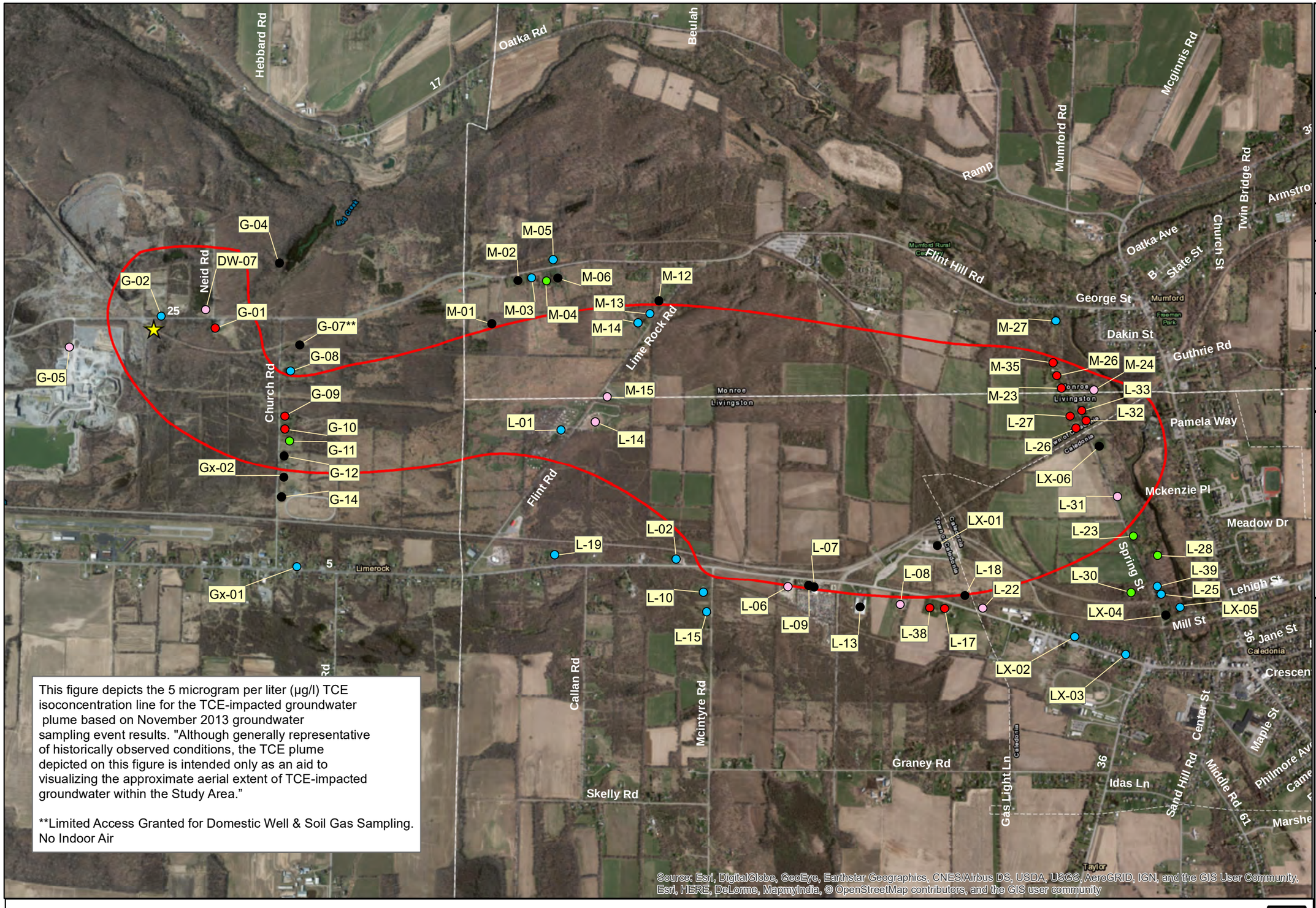

This figure depicts the 5 microgram per liter (µg/l) TCE isoconcentration line for the TCE-impacted groundwater plume based on November 2013 groundwater sampling event results. "Although generally representative of historically observed conditions, the TCE plume depicted on this figure is intended only as an aid to visualizing the approximate aerial extent of TCE-impacted groundwater within the Study Area."

**Limited Access Granted for Domestic Well & Soil Gas Sampling. No Indoor Air

1,000 500 0 1,000 2,000 Feet

INDOOR AIR MONITORING LOCATION MAP

Unicorn Management Consultants, LLC

52 Federal Road
Suite 2C
Danbury, CT
06810

(203) 205-9000

Project Name: Lehigh Valley Railroad Derailment Superfund Site

FIGURE 1

Author: RTM	**Checked By:** ----
Project #: 2032	**Created:** 7/11/10 **Revised:** 3/10/20
Scale: 1 in:1,800 ft	**File:** AirSample_Locs_2020

New York State

= Approximate Site Location

Legend

- Refused
- Not Sampled
- Mitigated
- ID Source
- No Further Action
- **UMC Site Trailer**
- 5 µg/l Isoconcentration Line

Table 1
Summary Indoor Air Monitoring Program 2008-2019
Validated TCE Results in ug/m^3
Lehigh Valley Railroad Derailment Superfund Site
LeRoy, Ny

Unicorn Management Consultants, LLC

ID	April 2008 Sampling				February 2009 Sampling						March 2009 Sampling					February 2010 Sampling					March 2010 Confirmation Sampling			February 2011 Sampling				
	Sub-Slab	Basement	Outdoor	Matrix 1 Result	Sub-slab	Crawl Space	Basement	First Floor	Outdoor	Matrix 1 Result	Sub-slab	Basement	First Floor	Outdoor †	Matrix 1 Result/Remark	Sub-slab	Crawl Space	Basement	Outdoor	Matrix 1 Result	Basement	First Floor	Outdoor	Sub-slab	Basement	First Floor	Outdoor‡	Matrix 1 Result
DW-07	structure demolished prior to 2008 - No sampling scheduled																											
G-01*	64	20	0.21U / 0.21U(dup)	Mitigate (12)	NS	NS	97	17	0.21U												1.5	0.21	0.08		2.5	0.52	0.05J	
G-02	1.5	0.21U	0.21U	NFA (1)	Property owner declined access for additional sampling																							
G-04																Property owner declined access for sampling												
G-05	New well not impacted - No sampling scheduled																											
G-07																Property owner declined access for sampling												
G-08	Property owner declined access for sampling				21U	NA	0.21U	NS	0.21U	NFA (1)																		
G-09*	410	3.3	0.21U	Mitigate (15)	31 / 27(dup)	NA	2.5 / 3.4(dup)	2.0	0.21U	Monitor (7)	See Remarks	3.6	1.9		leak tracer found in sub-slab sample indicates too much leakage to rely on results						1.6	1.2	0.085U		0.043J	0.4	0.084U	
G-10***	Property owner declined access for sampling				44	NA	1.0	NS	0.21U	Monitor (7)	39	1.3	1.1		Monitor (7)									42	8.3		0.078U	Mitigate (8)
G-11	0.86U	0.21U	0.21U	NFA (1)	2.1U	NA	0.64	NS	0.21U	ID Source (2)														0.65	0.94		0.077U	ID Source (2)
G-12	Property owner declined access for sampling				Property owner declined access for sampling											Property owner declined access for sampling												
G-14	Property owner declined access for sampling				Property owner declined access for sampling											Previous Refusal - No contact with property owner												
Gx-01																												
Gx-02																												
L-01	1.3	0.21U	0.21U	NFA (1)	Property owner declined access for additional sampling																							
L-02					0.86U	NA	0.24	NS	0.21U	NFA (1)																		
L-06					Misidentified as a Right-of-Way parcel - Not Sampled																							
L-07					Property owner declined access for sampling											Property owner declined access for sampling												
L-08					Active automotive repair facility - Not Sampled																							
L-09					Property owner declined access for sampling											Property owner declined access for sampling												
L-10					NA	0.23	0.21U	NS	0.21U																			
L-13					Property owner declined access for sampling											Property owner declined access for sampling												
L-14	Unheated seasonal use structure - Not Sampled																											
L-15																NA	0.061 J	0.089U	0.08U									
L-17*					26	NA	2.9	0.91	0.21U	Monitor (7)	81	2.6	5.9		Mitigate (11)						1.9 / 1.9(dup)	0.95	0.085U		11	6	See Note	
L-18					Property owner declined access for sampling											Property owner declined access for sampling												
L-19																No contact with property owner												
L-19																No building on lot - Not sampled												
L-22																Unused auto repair facility - Not Sampled												
L-23					4.2	NA	0.81	NS	0.21U	ID Source (2)														0.93	0.79		0.079U	ID Source (2)
L-25																8.1 / 7.7(dup)	NA	0.13 / 0.068J(dup)	NS	NFA (5)								
L-26*					2,500	NA	36	NS	0.21U	Mitigate (16)	3,400	16	6.4		Mitigate (16) 21 ug/L TCE in sump water						0.8	0.52	0.086U		0.047J	0.073J	0.079U	
L-27*					4,600	NA	17	NS	0.27	Mitigate (16)	370	17	8.6		Mitigate (16) 17 ug/L TCE in sump water						6.9	7.7	NS		0.088U	0.04J	0.081U	
L-28					0.86U	NA	0.7	NS	0.21U	ID Source (2)														1.1	1.1		0.079U	ID Source (3)
L-30																No contact with property owner												
L-31					Structure demolished prior to 2008 - Not Sampled																							
L-32*					1,200	NA	1.9	NS	0.21U	Mitigate (15)	1,800	3.4	3		Mitigate (15), Basement Flooded Prior to Feb Sampling, <1 ug/L TCE in sump water						1.4	1.4	0.13U		0.24	0.18	0.077U	
L-33*					120	NA	2.1	NS	0.26	Mitigate (11)	520	3.7	2.8		Mitigate (15)						2.2	1.4	0.1U		0.042J	0.088U	0.077U	
L-38***					Property owner declined access for sampling											47	NA	2.2	0.082U	Monitor (7)				39	2.6		0.08U	Monitor (7)
L-39**																6.8	NA	0.26	0.08U	Monitor (6)					0.086U	0.089U	0.078U	
Lx-01																Property owner declined access for sampling												
Lx-02																0.32	NA	0.078J / 0.039J	0.079U	NFA (1)								
Lx-03																0.24	NA	0.062J	0.19	NFA (1)								
Lx-04																Property owner declined access for sampling												
Lx-05																4.1	NA	0.088	0.078U	NFA (1)								
Lx-06																Property owner declined access for sampling												
M-01																Property owner declined access for sampling												
M-02					Property owner declined access for sampling											Previous Refusal - No contact with property owner												
M-03					Property owner declined access for sampling											NS	NA	0.05J	0.081U									
M-04					Property owner declined access for sampling											Property owner declined access for sampling												
M-05					1.1	NA	0.24	NS	0.21U	NFA (1)																		
M-06					Property owner declined access for sampling											Previous Refusal - No contact with property owner												
M-12																Property owner declined access for sampling												
M-13	0.91	0.21U	0.21U	NFA (1)	Property owner declined access for additional sampling																							
M-14	Property owner declined access for sampling				0.86U	NA	0.21U	NS	0.21U	NFA (1)																		
M-15																Seasonal Meeting Place - No Contact - Not sampled												
M-23*					320	NA	0.36	NS	0.21U	Mitigate (14)	250 / 280(dup)	0.28 / 0.28(dup)	NS		Mitigate (14)						0.044J / 0.037J(dup)	0.034J	1.4		0.03J / 0.33J (dup)	0.086U / 0.090U (dup)	0.073UJ / 0.19J (dup)	
M-24					Unheated seasonal use structure - Not Sampled																							
M-26§					0.86U	NA	9.7	NS	0.21U	ID Source (4)	0.86U	2.1	NS		ID Source (3)									10	0.2		0.076U	NFA (5)
M-27																0.041J	0.083U	NA	0.35	NFA (1)								
M-35*					100	NA	1.8	NS	0.21U	Mitigate (11)	97	2.5	1.5		Mitigate (11)						1.4	0.8	0.085U		0.59	0.61	0.078U	

Table 1
Summary Indoor Air Monitoring Program 2008-2019
Validated TCE Results in ug/m^3
Lehigh Valley Railroad Derailment Superfund Site
LeRoy, Ny

Unicorn Management Consultants, LLC

ID	January 2012 Sampling						March 2012 Sampling					February 2013 Sampling					February 2014 Sampling			November 2014 Sampling			
	Sub-slab	Basement	First Floor	Outdoor	Sump Crock	Matrix 1 Result	Sub-slab	Basement	First Floor	Outdoor	Matrix 1 Result	Sub-slab	Basement	First Floor	Outdoor	Matrix 1 Result	Basement	First Floor	Outdoor	Sub-slab	Basement	First Floor	Outdoor
DW-07																							
G-01*																	0.47 / 0.48(dup)	0.21	0.1				
G-02																							
G-04																							
G-05																							
G-07																							
G-08																							
G-09*		0.038J	0.093U	0.085U	8.8												0.035J	0.032U	0.028J				
G-10***		0.98	0.95	0.085U													6.1	7.6	0.044J	47.98 (Subslab 1) 5.54 (Subslab 2)	9.18 (Basement 1) 7.36 (Basement 2)	3.46 (Firstfloor 1) 3.35 (Fisrtfloor 2)	0.11U
G-11																							
G-12																							
G-14																							
Gx-01							0.092U	0.094U	0.098U	0.091U	NFA (1)												
Gx-02												Property owner declined access for sampling											
L-01																							
L-02																							
L-06																							
L-07																							
L-08																							
L-09																							
L-10																							
L-13																							
L-14																							
L-15																							
L-17*		5.1	1.9	0.088U									4.2 (Basement 1) 1.6 (Basement 2) 3.8 (Basement 3) 0.67 (Crawlspace) 0.6 (Cistern)	1.8 (Firstfloor-1) 2.1 (Firstfloor-2) 1.9 (Firstfloor-3) 1.9 (Firstfloor-4) 0.085U (Kitchen Sub-floor)	0.078U		7.8 (Basement 1) 6.8 (Basement 2)	3.6 (Fisrtfloor 1) 3.1 (Firstfloor 2)	0.029J	2.81 (Subslab) 42.57 (Submembrane)	2.35 (Basement 1) / 2.2 (dup) 1.2 (Basement 2)	0.62 (Firstfloor 1) 0.73 (Firstfloor 2)	0.24U
L-18																							
L-19																							
L-19																							
L-22																							
L-23																							
L-25																							
L-26*																	0.034J	0.037J	0.031J				
L-27*																	0.26	0.6	0.027U				
L-28																							
L-30	0.99	0.24	0.13	0.082U		NFA (1)						1.3	0.3	0.23	0.081U	ID Source (2)							
L-31																							
L-32*																	0.22 / 0.24 (dup)	0.22	0.045J				
L-33*																	0.026U	0.030U	0.029J				
L-38***		0.037J	0.047J	0.085U													0.030U	0.031U	0.026U				
L-39**																							
Lx-01																							
Lx-02																							
Lx-03																							
Lx-04																							
Lx-05																							
Lx-06																							
M-01																							
M-02																							
M-03																							
M-04							1.1	5.9 / 6.0(dup)		0.089U	ID Source (4)	0.52	0.36		0.073U	ID Source (2)							
M-05																							
M-06																							
M-12																							
M-13																							
M-14																							
M-15																							
M-23*																	0.035J	0.031J	0.027U				
M-24																							
M-26§	130	0.092		0.083U (OUTDOOR-A) 0.083U (OUTDOOR-B) 0.084U (OUTDOOR-B DUP)		Monitor (9)							0.13	0.084U	0.076U / 0.074U (dup)		0.048J	0.035J	0.026U				
M-27																							
M-35*																	0.93	0.45	0.046J				

Table 1
Summary Indoor Air Monitoring Program 2008-2019
Validated TCE Results in ug/m^3
Lehigh Valley Railroad Derailment Superfund Site
LeRoy, Ny

Unicorn Management Consultants, LLC

ID	January 2015 Sampling				March 2015 Sampling					February - March 2017 Sampling			January 2018 Sampling			October 2019 Soil Gas Sampling	
	Sub-slab	Basement	First Floor	Outdoor	Sub-slab	Basement	First Floor	Outdoor	Matrix 1 Result	Basement	First Floor	Outdoor	Basement	First Floor	Outdoor	Soil Gas	Outdoor
DW-07																	
G-01*										0.57	0.15J	0.13U					
G-02																	
G-04																	
G-05																	
G-07																0.11U / 0.11U (dup)	0.19
G-08																	
G-09*										0.19J / 0.15UJ (dup)	0.16	0.16U					
G-10***	1.2J	1.82 (Basement 1) 1.54 (Basement 2)	2.72 (Firstfloor 1) 2.49 (Fisrtfloor 2)	0.14U		0.17U (Basement 1) 0.17U (Basement 2)	0.12U (Firstfloor 1) 0.12U (Fisrtfloor 2)	0.18U		0.3	0.37	0.17					
G-11																	
G-12																	
G-14																	
Gx-01																	
Gx-02																	
L-01																	
L-02																	
L-06																	
L-07																	
L-08																	
L-09																	
L-10																	
L-13																	
L-14																	
L-15																	
L-17*	0.8 (Subslab) 15.98 (Submembrane)	1.7 (Basement 1) / 2.08 (dup) 1.99 (Basement 2)	0.69 (Firstfloor 1) 2.11 (Firstfloor 2)	0.13U		0.17U (Basement 1) 0.15U (Basement 2) / 0.48U (dup)	0.12U (Firstfloor 1) 0.16U (Fisrtfloor 2)	0.15U		0.15U (Basement 1) 0.15 (Basement 2) 0.14U (Kitchen Crawlspace) / 0.15U (dup)	0.18U (Firstfloor 1) 0.15J (Firstfloor 2)	0.15U					
L-18																	
L-19					0.17U (L-19A) 0.18U (L-19B)	No Basement (L-19A) No Basement (L-19B)	0.12U (L-19A) 0.17U (L-19B)	0.15U◊	NFA (1) (L-19A) NFA (1) (L-19B)								
L-19																	
L-22																	
L-23																	
L-25																	
L-26*										0.15U	0.2	0.83					
L-27*										0.17U	0.16U	0.15U					
L-28																	
L-30																	
L-31																	
L-32*										0.3	0.16U	0.15U					
L-33*										0.15U	0.15U	0.14U					
L-38***										0.13 U	0.14 U	0.12 U					
L-39**																	
Lx-01																	
Lx-02																	
Lx-03																	
Lx-04																	
Lx-05																	
Lx-06																	
M-01																	
M-02																	
M-03																	
M-04																	
M-05																	
M-06																	
M-12																	
M-13																	
M-14																	
M-15																	
M-23*										0.14U	0.58	0.21					
M-24																	
M-26§										0.28	0.25	0.14U					
M-27																	
M-35*										2	0.49	0.15U	0.12U / 0.12U (dup)	0.13U	0.12U	0.12U / 0.12U (dup	0.12U

Table 1 (Notes)
Summary Indoor Air Monitoring Program 2008-2019
Validated TCE Results in ug/m^3
Lehigh Valley Railroad Derailment Superfund Site
LeRoy, Ny

Unicorn Management Consultants, LLC

NOTES:

1) The NYSDOH Decission Matrix 1 results are shown with their respective numerical result in parenthesis.
2) Blank fields indicate the location was not scheduled for sampling during that phase.
3) Location L-19 is comprised of two land parcels. One parcel does not have any structures on it. The other has two small homes in close proximity to each other. These two houses have been labeled L-19A and L-19B by UMC. See report text for more information.

† Due to lack of available canisters, two representative ambient (outdoor) samples were taken. TCE results for both were 0.21U ug/m^3.
‡ Due to proximity L-17 and L-38 share a representative outdoor sample.
* Active SVI mitigation system installed by UMC during February 2010
** Radon mitigation system installed by homeowner during summer 2010
*** Avtive SVI mitigation system installed by UMC during December 2011
§ Active SVI mitigation system installed during January 2013
◊ Due to proximity L-19A and L-19 B share a representative outdoor sample.

NFA = No Further Action
NS = Not Sampled
NA = Not Applicable
(dup) = Field Duplicate Results

"U" = "U" = The analyte was analized for but was not detected above the reported sample quantitation limit.
"J" = "J" = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 2
Summary of Validated Analytical Results in ug/m^3
For 2019-2020 Heating Season Sample Locations (G-07 Soil Gas Only)
Lehigh Valley Railroad Derailment Superfund Site
LeRoy, NY

Unicorn Management Consultants, LLC

Sample Location	G-07					
Sample Date	10/23/2019					
Sample ID	G07-04		DUP102319		G07-OUTDOOR	
Lab Report Number	P1800286					
VOCs of Interest						
TRICHLOROETHYLENE (TCE)	0.11	U	0.1	U	0.19	
CIS-1,2-DICHLOROETHYLENE	0.11	U	0.11	U	0.1	U
TRANS-1,2-DICHLOROETHENE	0.11	U	0.11	U	0.1	U
1,2-DICHLOROETHYLENE (TOTAL)	BDL		BDL		BDL	
VINYL CHLORIDE	0.086	U	0.081	U	0.078	U
Other VOCs						
ACETONE	12		12		2.7	J
ACETONITRILE	0.2	U	0.18	U	0.18	U
ACROLEIN	0.23	U	0.21	J	0.2	U
ACRYLONITRILE	0.17	U	0.16	U	0.15	U
ALLYL CHLORIDE (3-CHLOROPROPENE)	0.11	U	0.1	U	0.098	U
ALPHA-PINENE	0.6	J	0.58	J	0.11	J
BENZENE	1.1		1.1		0.14	J
BENZYL CHLORIDE	0.18	U	0.17	U	0.16	U
BROMODICHLOROMETHANE	0.12	U	0.11	U	0.1	U
BROMOFORM	0.17	U	0.16	U	0.15	U
BROMOMETHANE	0.11	U	0.11	U	0.1	U
1,3-BUTADIENE	0.13	U	0.12	U	0.12	U
CARBON DISULFIDE	0.87	J	0.85	J	0.33	J
CARBON TETRACHLORIDE	0.22		0.24		0.36	
CHLOROBENZENE	0.11	U	0.1	U	0.097	U
CHLOROETHANE	0.1	U	0.094	U	0.09	U
CHLOROFORM	0.26		0.27		0.097	U
CHLOROMETHANE	0.13	UJ	0.12	UJ	0.12	UJ
CYCLOHEXANE	15		15		0.2	U
DIBROMOCHLOROMETHANE	0.11	U	0.099	U	0.095	U
1,2-DIBROMOETHANE (ETHYLENE DIBROMIDE)	0.094	U	0.088	U	0.084	U
1,2-DIBROMO-3-CHLOROPROPANE	0.15	U	0.14	U	0.14	U
1,2-DICHLOROBENZENE	0.12	U	0.11	U	0.11	U
1,3-DICHLOROBENZENE	0.12	U	0.11	U	0.11	U
1,4-DICHLOROBENZENE	0.12	U	0.12	U	0.11	U
DICHLORODIFLUOROMETHANE	2.4		2.4		1.9	
1,1-DICHLOROETHANE	0.12	U	0.11	U	0.11	U
1,2-DICHLOROETHANE	0.089	U	0.084	U	0.08	U
1,1-DICHLOROETHENE	0.11	U	0.11	U	0.1	U
1,2-DICHLOROPROPANE	0.1	U	0.094	U	0.09	U
CIS-1,3-DICHLOROPROPENE	0.13	U	0.12	U	0.11	U
TRANS-1,3-DICHLOROPROPENE	0.17	U	0.16	U	0.15	U
1,2-DICHLOROTETRAFLUOROETHANE	0.13	U	0.12	U	0.11	U
1,4-DIOXANE (P-DIOXANE)	0.095	U	0.089	U	0.086	U
D-LIMONENE	1.2		1.2		0.15	U
ETHANOL	36		36		1.8	J
ETHYL ACETATE	0.89	J	0.98	J	0.79	J
ETHYLBENZENE	0.68	J	0.41	J	0.1	U
4-ETHYLTOLUENE	0.13	U	0.12	U	0.12	U
HEXACHLOROBUTADIENE	0.17	U	0.16	U	0.15	U
2-HEXANONE	0.1	U	0.094	U	0.09	U
ISOPROPANOL	7.3		7.5		3.4	
ISOPROPYLBENZENE (CUMENE)	0.12	J	0.13	J	0.1	U
METHYL ETHYL KETONE (2-BUTANONE)	0.69	J	0.55	J	0.31	J
METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	0.44	J	0.23	J	0.099	U
METHYL METHACRYLATE	0.29	U	0.27	U	0.26	U
METHYLENE CHLORIDE	0.23	U	0.21	U	0.2	U
NAPHTHALENE	0.2	U	0.18	U	0.18	U
N-BUTYL ACETATE	0.71	J	0.1	U	0.099	U
N-HEPTANE	8		8		0.12	U
N-HEXANE	13		13		0.15	U
N-NONANE	2.2		2.2		0.12	U
N-OCTANE	4.5		4.4		0.16	U
N-PROPYLBENZENE	0.12	U	0.14	J	0.1	U
PROPYLENE	2.4		2.5		0.96	
STYRENE	0.13	U	0.12	U	0.12	U
TERT-BUTYL METHYL ETHER	0.095	U	0.089	U	0.086	U
1,1,2,2-TETRACHLOROETHANE	0.11	U	0.11	U	0.1	U
TETRACHLOROETHYLENE(PCE)	0.4		0.42		0.094	U
TETRAHYDROFURAN	0.1	U	0.095	U	0.091	U
TOLUENE	2.4		2.7		0.21	J
1,2,4-TRICHLOROBENZENE	0.2	U	0.18	U	0.18	U
1,1,1-TRICHLOROETHANE	0.1	U	0.094	U	0.09	U
1,1,2-TRICHLOROETHANE	0.082	U	0.077	U	0.073	U
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	0.61	J	0.6	J	0.46	J
TRICHLOROFLUOROMETHANE	1.8		1.8		1	
1,2,4-TRIMETHYLBENZENE	0.45	J	0.7	J	0.1	U
1,3,5-TRIMETHYLBENZENE (MESITYLENE)	0.32	J	0.39	J	0.1	U
VINYL ACETATE	1.8	U	1.7	U	1.6	U
M-P-XYLENE	3.5		2.2		0.19	U
O-XYLENE (1,2-DIMETHYLBENZENE)	1		0.84		0.1	U
XYLENES (TOTAL)	4.5		3.04		BDL	

Qualifiers

U = Compound was analyzed for, but not detected above the laboratory detection limit.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.
J- = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. Biased Low.
J+ = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL. Biased High.

Notes

1) 1,2 Dichloroethene (total) is the sum of cis- and trans-1,2 Dichloroethene detected in the sample.
2) Xylene (total) is the sum of meta-, para-, and ortho-xylene detected in the sample.
3) BDL means that the individual compounds were below detection limits.

Appendix A:
September 16, 2019 IAMP Notification Letters

G-01

52 Federal Road, Suite 2C
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www.unicornmgt.com

Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-1

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Cameron:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

G-09

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-2

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections [redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Yauchzee:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

G-10

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-3

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Sickles:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located a[redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

L-17

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-4

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Stein:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
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M. Hill, Esq. (Blank Rome)

L-26

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-5

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. and Mrs. DuBois:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located a[redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
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M. Hill, Esq. (Blank Rome)

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-6

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Stack:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you later this year to schedule the SVI mitigation system inspection at your property located at [redacted] If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-7

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Herson:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located a[redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-8

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Manley:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

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A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted]. UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-9

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. and Mrs. D'Agastino:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

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A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located a[redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

L-39

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-10

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mrs. Brisson:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you later this year to schedule the SVI mitigation system inspection at your property located at [redacted] If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

M-23

52 Federal Road, Suite 2C
Danbury, CT 06810
Tele: (203) 205-9000
Fax: (203) 205-9011
www.unicornmgt.com

Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-11

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Robbins:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

M-26

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-12

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. and Mrs. Burns:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

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A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located a[redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

M-35

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Unicorn Management Consultants, LLC

September 16, 2019
OP-4090-13

[redacted]

Subject: 2019-2020 Soil Vapor Intrusion Mitigation System Maintenance and Inspections
[redacted]
Lehigh Valley Railroad Derailment Superfund Site, LeRoy, NY

Dear Mr. Callanan:

Unicorn Management Consultants, LLC (UMC) is writing to inform you of the upcoming indoor-air monitoring activities scheduled for the 2019-2020 New York State heating season in the vicinity of the Lehigh Valley Railroad Derailment Superfund Site in LeRoy, NY ("Site").

In October 2019, UMC plans to replace the existing blower fan installed in the soil vapor intrusion (SVI) mitigation system located on your property. This replacement is necessary because the currently installed blower fan is nearing the end of its expected working life (approximately 10-years), and UMC wants to ensure the continued operation of your home's SVI mitigation system. The blower fan replacement work should take between 60 to 90-minutes to perform, and will require access to your home's circuit breaker panel. The blower fan replacement will be conducted at no cost to you.

Later, in January to February 2020, UMC plans to conduct the annual inspections of the soil vapor intrusion (SVI) mitigation systems installed in buildings within the Site vicinity. The purpose of these inspections is to ensure that the installed SVI mitigation systems continue to operate properly. During the inspection, UMC's contractor will assess the operation of the newly installed blower fans, check the system piping for cracks or other damage, and measure the sub-slab vacuum produced by the system. If any issues are discovered during the inspection, they will be addressed at the time of the inspection. The inspection and any required repairs will be conducted at no cost to you.

Additional information regarding the Site can be found on EPA's Site-specific web page located at https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0203481.

A UMC representative will contact you shortly to schedule the SVI mitigation system blower fan replacement at your property located at [redacted] UMC will schedule the February 2020 SVI system inspections at a later date. If you have any questions or comments, please contact me at (203)-205-9000 ext. 11.

Sincerely,
Unicorn Management Consultants, LLC.

Francisco Trejo
Project Coordinator
Lehigh Valley Railroad Derailment Superfund Site

Cc: M. Jon (EPA)
D. Cutt (EPA)
U. Filipowicz (EPA)
C. Magee (NYSDEC) electronic only
M. Doroski (NYSDOH) electronic only
M. Hill, Esq. (Blank Rome)

Appendix B:
G-07 Soil Gas Sampling Work Plan

Interoffice Memo

Unicorn Management Consultants, LLC

Date: October 10, 2019
To: Francisco Trejo
Cc: Michael O'Connor
From: Michael Persico
Re: G-07 Soil Gas Sampling Workplan

On October 21-24, 2019, UMC intends to collect a round of soil gas samples from the property associated with private domestic well G-07 (8825 Church Road, LeRoy, NY). UMC will collect soil gas samples over a 24-hour period from a total of 5-locations on the property. UMC will also collect 1- ambient air sample and 1-duplicate sample during this event. The following procedure will be followed during the collection of soil gas samples during this event.

Tools & Materials:

- Poly Sheeting
- 5-gallon Buckets
- Nitrile Gloves
- Hand Auger with 15-feet of Extension Rods
- Trowel
- Electronic Water Level Meter
- Photo Ionization Detector (PID)
- Field Notebook & Pen
- Well Sand
- Soil Gas Sampling Points
- Soil Gas Sampling Point Screens
- ¼-inch OD Teflon Tubing
- Bentonite Slurry Mix
- DI Water
- Portable Air Pump
- Summa Canisters
- Summa Canister Flow Controllers (24-hour calibrated)
- Canister Labels
- Rubbermaid Brand or Similar Plastic Tubs

Procedure:

For each soil gas sample location, the following procedure will be followed in order to collect a soil gas sample.

1. Set up poly and/or a decontaminated bucket near the sample location for the temporary containment of soils removed during sample collection. These soils will be used to backfill the hole later.

2. Using a decontaminated hand auger, advance a borehole until refusal or until the water table is reached. A borehole with a minimum depth of 4-feet will be required in order to collect a soil gas sample.
3. Check the bottom of the borehole for water using the electronic water level meter. Check the borehole with the PID and record PID reading in the field notebook.
4. Fill the borehole with sand to a depth approximately 6 to 12-inches from the borehole bottom or the observed water table.
5. Attach a soil gas sampling point and screen onto the end of an appropriate length of Teflon tubing, and lower the point into the borehole until it rests on top of the sand. Approximately 12 to 18-inces of tubing should remain above ground surface. It is important to make sure that the soil gas sampling point does not come in contact with groundwater.
6. Fill the borehole with another 6 to 12- inches of sand.
7. In a 5-gallon bucket, mix a bentonite slurry.
8. Fill the next 3-feet of the borehole with the bentonite slurry in order to plug the borehole and reduce the possibility of ambient air infiltrating the borehole.
9. Fill the remainder of the borehole with the soil that was initially removed from the borehole.
10. Once the temporary probe is installed and sealed in the borehole, attach a purge pump to the end of the tubing above ground surface and purge 1 to 3-hole volumes of air. The purge flow rate should not exceed 0.2 liters per minute in order to minimize ambient air infiltration.
11. Once the borehole has been purged, connect a Summa canister and flow controller to the tubing.
12. Open the Summa canister valve to begin the sample collection.
13. Place a Rubbermaid brand or similar container over the borehole and Summa canister to protect the setup from any inclement weather.
14. After approximately 24-hours, return to the sample location and close the Summa canister valve.
15. Package the Summa cannister for shipping and complete a chain of custody.
16. Remove the top 1 to 2-feet of soil or bentonite slurry from the borehole.
17. Remove as much of the tubing from the hole as possible. If necessary, cut the tubing approximately 1 to 2-feet below ground surface.
18. Backfill the borehole with soil. Re-seed if necessary. Remaining soils will be relocated to an area on the property of the property owners choosing.

Appendix C:
G-07 Analytical Reports and Data Validation Reports

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

November 27, 2019

Michael O'Connor
Unicorn Management Consultants
52 Federal Road Suite 2C
Danbury, CT 06810

RE: LVRR Soil Gas / 2032-770

Dear Michael:

Enclosed are the results of the samples submitted to our laboratory on October 29, 2019. For your reference, these analyses have been assigned our service request number P1906559.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

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

Respectfully submitted,

ALS | Environmental

Kate Kaneko
By Kate Kaneko at 9:56 am, 11/27/19

Kate Kaneko
Laboratory Director

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: Unicorn Management Consultants
Project: LVRR Soil Gas / 2032-770

Service Request No: P1906559

CASE NARRATIVE

The samples were received intact under chain of custody on October 29, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The upper control criterion was exceeded for benzyl chloride in the Continuing Calibration Verification (CCV) analyzed on November 16, 2019. Since the apparent problem equates to a potential high bias and the field sample(s) analyzed in this sequence did not contain the analyte(s) in question, the data quality is not affected. No corrective action was required.

The spike recovery of methyl tert-butyl ether for the Laboratory Control Sample (LCS) analyzed on November 16, 2019 was outside the Laboratory generated control criterion. The recovery error equates to a potential high bias. However, the spike recovery of the analyte in question was within the method criteria; therefore, the data quality is not significantly affected. No corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Unicorn Management Consultants Service Request: P1906559
Project ID: LVRR Soil Gas / 2032-770

Date Received: 10/29/2019
Time Received: 09:15

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-15 - VOC Cans
G07-04	P1906559-001	Air	10/23/2019	16:30	AS01406	-1.69	4.89	X
Dup102319	P1906559-002	Air	10/23/2019	16:32	AS00982	-1.76	3.66	X
G07-Outdoor	P1906559-003	Air	10/23/2019	16:25	AS01087	-1.18	3.70	X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. 1706559

Company Name & Address (Reporting Information)
Unicorn Management Consultants, LLC
52 Federal Road, Suite 2C
Danbury, CT 06810

Project Manager: Michael O'Connor

Phone: (203) 205-9000 Fax: (203) 205-9011

Email Address for Result Reporting: meconnor@unicornmgt.com / Farey@unicornmgt.com / mpersico@unicornmgt.com / Edickinson@ddmsinc.com

Project Name: LVRR Soil Gas

Project Number: 2052-770

P.O. # / Billing Information: 2052-770
Isabel Miller
imiller@unicornmgt.com

Sampler (Print & Sign): umc / umc

ALS Contact: Kate Kanecka

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method: TO-15 Low Level w/ TICs		Comments e.g. Actual Preservative or specific instructions
G07-04	1	10/23/19	1630	AS01406	FCR00177	30	5	6L	X		
Dup102319	2	10/23/19	1632	AS00982	FCR00208	28	5	6L	X		
G07-Outdoor	3	10/23/19	1625	AS01087	FCR00490	28	1	6L	X		

5 of 160

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____ Tier III (Results + QC & Calibration Summaries) ____
Tier II (Results + QC Summaries) ____ Tier IV (Data Validation Package) 10% Surcharge X

EDD required (Yes) / No
Type: EPA Region 2 Units: ____

Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	10/25/19	1800	FedEx		
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
				10-29-19	0915

Cooler / Blank Temperature ____ °C

ALS Environmental
Sample Acceptance Check Form

Client: Unicorn Management Consultants Work order: P1906559

Project: LVRR Soil Gas / 2032-770

Sample(s) received on: 10/29/19 Date opened: 10/29/19 by: ADAVID

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	☐
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1906559-001.01	6.0 L Silonite Can					
P1906559-002.01	6.0 L Silonite Can					
P1906559-003.01	6.0 L Silonite Can					
P1906559-004.01	6.0 L Silonite Can					
P1906559-005.01	6.0 L Silonite Can					
P1906559-006.01	6.0 L Silonite Can					
P1906559-007.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): _____

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**2.4**	0.80	0.20	**1.4**	0.47	0.11	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.4**	0.80	0.13	**0.49**	0.16	0.027	
74-87-3	Chloromethane	ND	0.32	0.13	ND	0.15	0.063	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.80	0.13	ND	0.11	0.018	
75-01-4	Vinyl Chloride	ND	0.17	0.086	ND	0.065	0.034	
106-99-0	1,3-Butadiene	ND	0.32	0.13	ND	0.14	0.060	
74-83-9	Bromomethane	ND	0.33	0.11	ND	0.086	0.029	
75-00-3	Chloroethane	ND	0.33	0.10	ND	0.13	0.038	
64-17-5	Ethanol	**36**	7.9	0.56	**19**	4.2	0.30	
75-05-8	Acetonitrile	ND	0.80	0.20	ND	0.48	0.12	
107-02-8	Acrolein	ND	1.5	0.23	ND	0.66	0.099	
67-64-1	Acetone	**12**	8.0	1.8	**5.2**	3.4	0.76	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.8**	0.80	0.12	**0.32**	0.14	0.022	
67-63-0	2-Propanol (Isopropyl Alcohol)	**7.3**	3.2	0.33	**3.0**	1.3	0.14	
107-13-1	Acrylonitrile	ND	0.80	0.17	ND	0.37	0.077	
75-35-4	1,1-Dichloroethene	ND	0.17	0.11	ND	0.042	0.028	
75-09-2	Methylene Chloride	ND	0.80	0.23	ND	0.23	0.065	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.82	0.11	ND	0.26	0.035	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.61**	0.82	0.11	**0.079**	0.11	0.015	**J**
75-15-0	Carbon Disulfide	**0.87**	1.7	0.24	**0.28**	0.53	0.078	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.17	0.11	ND	0.042	0.028	
75-34-3	1,1-Dichloroethane	ND	0.17	0.12	ND	0.041	0.029	
1634-04-4	Methyl tert-Butyl Ether	ND	0.82	0.095	ND	0.23	0.026	
108-05-4	Vinyl Acetate	ND	8.2	1.8	ND	2.3	0.51	
78-93-3	2-Butanone (MEK)	**0.69**	1.7	0.17	**0.23**	0.56	0.056	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.17	0.11	ND	0.042	0.029	
141-78-6	Ethyl Acetate	**0.89**	1.7	0.42	**0.25**	0.46	0.12	**J**
110-54-3	n-Hexane	**13**	0.82	0.17	**3.6**	0.23	0.047	
67-66-3	Chloroform	**0.26**	0.17	0.11	**0.054**	0.034	0.022	
109-99-9	Tetrahydrofuran (THF)	ND	0.83	0.10	ND	0.28	0.034	
107-06-2	1,2-Dichloroethane	ND	0.17	0.089	ND	0.041	0.022	
71-55-6	1,1,1-Trichloroethane	ND	0.17	0.10	ND	0.030	0.018	
71-43-2	Benzene	**1.1**	0.17	0.12	**0.33**	0.052	0.036	
56-23-5	Carbon Tetrachloride	**0.22**	0.17	0.11	**0.036**	0.026	0.018	
110-82-7	Cyclohexane	**15**	1.7	0.23	**4.3**	0.48	0.066	
78-87-5	1,2-Dichloropropane	ND	0.17	0.10	ND	0.036	0.022	
75-27-4	Bromodichloromethane	ND	0.17	0.12	ND	0.025	0.017	
79-01-6	Trichloroethene	ND	0.17	0.11	ND	0.031	0.020	
123-91-1	1,4-Dioxane	ND	0.82	0.095	ND	0.23	0.026	
80-62-6	Methyl Methacrylate	ND	1.7	0.29	ND	0.41	0.070	
142-82-5	n-Heptane	**8.0**	0.82	0.13	**2.0**	0.20	0.031	
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	0.13	ND	0.17	0.028	
108-10-1	4-Methyl-2-pentanone	**0.44**	0.80	0.11	**0.11**	0.20	0.027	**J**
10061-02-6	trans-1,3-Dichloropropene	ND	0.80	0.17	ND	0.18	0.037	
79-00-5	1,1,2-Trichloroethane	ND	0.17	0.082	ND	0.030	0.015	
108-88-3	Toluene	**2.4**	0.82	0.098	**0.64**	0.22	0.026	
591-78-6	2-Hexanone	ND	0.82	0.10	ND	0.20	0.024	
124-48-1	Dibromochloromethane	ND	0.17	0.11	ND	0.020	0.012	
106-93-4	1,2-Dibromoethane	ND	0.17	0.094	ND	0.022	0.012	
123-86-4	n-Butyl Acetate	**0.71**	0.83	0.11	**0.15**	0.17	0.023	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	**4.5**	0.82	0.18	**0.96**	0.17	0.039	
127-18-4	Tetrachloroethene	**0.40**	0.15	0.10	**0.058**	0.022	0.015	
108-90-7	Chlorobenzene	ND	0.82	0.11	ND	0.18	0.023	
100-41-4	Ethylbenzene	**0.68**	0.82	0.11	**0.16**	0.19	0.026	**J**
179601-23-1	m,p-Xylenes	**3.5**	1.7	0.21	**0.80**	0.38	0.049	
75-25-2	Bromoform	ND	0.82	0.17	ND	0.079	0.016	
100-42-5	Styrene	ND	0.80	0.13	ND	0.19	0.031	
95-47-6	o-Xylene	**1.0**	0.82	0.12	**0.24**	0.19	0.027	
111-84-2	n-Nonane	**2.2**	0.82	0.13	**0.42**	0.16	0.026	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.17	0.11	ND	0.024	0.016	
98-82-8	Cumene	**0.12**	0.82	0.12	**0.024**	0.17	0.024	**J**
80-56-8	alpha-Pinene	**0.60**	0.82	0.12	**0.11**	0.15	0.022	**J**
103-65-1	n-Propylbenzene	ND	0.82	0.12	ND	0.17	0.024	
622-96-8	4-Ethyltoluene	ND	0.82	0.13	ND	0.17	0.026	
108-67-8	1,3,5-Trimethylbenzene	**0.32**	0.80	0.12	**0.065**	0.16	0.024	**J**
95-63-6	1,2,4-Trimethylbenzene	**0.45**	0.80	0.11	**0.092**	0.16	0.023	**J**
100-44-7	Benzyl Chloride	ND	1.7	0.18	ND	0.32	0.035	
541-73-1	1,3-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.020	
106-46-7	1,4-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.021	
95-50-1	1,2-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.020	
5989-27-5	d-Limonene	**1.2**	0.82	0.17	**0.22**	0.15	0.030	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.80	0.15	ND	0.083	0.016	
120-82-1	1,2,4-Trichlorobenzene	ND	0.82	0.20	ND	0.11	0.026	
91-20-3	Naphthalene	ND	0.79	0.20	ND	0.15	0.037	
87-68-3	Hexachlorobutadiene	ND	0.80	0.17	ND	0.075	0.016	

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J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-002

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00982

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**2.5**	0.75	0.18	**1.4**	0.44	0.11	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.4**	0.75	0.12	**0.48**	0.15	0.025	
74-87-3	Chloromethane	ND	0.30	0.12	ND	0.14	0.059	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	0.12	ND	0.11	0.017	
75-01-4	Vinyl Chloride	ND	0.16	0.081	ND	0.061	0.032	
106-99-0	1,3-Butadiene	ND	0.30	0.12	ND	0.13	0.057	
74-83-9	Bromomethane	ND	0.31	0.11	ND	0.080	0.027	
75-00-3	Chloroethane	ND	0.31	0.094	ND	0.12	0.036	
64-17-5	Ethanol	**36**	7.4	0.53	**19**	3.9	0.28	
75-05-8	Acetonitrile	ND	0.75	0.18	ND	0.45	0.11	
107-02-8	Acrolein	**0.21**	1.4	0.21	**0.094**	0.62	0.093	**J**
67-64-1	Acetone	**12**	7.5	1.7	**5.2**	3.2	0.72	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.8**	0.75	0.12	**0.31**	0.13	0.020	
67-63-0	2-Propanol (Isopropyl Alcohol)	**7.5**	3.0	0.31	**3.0**	1.2	0.13	
107-13-1	Acrylonitrile	ND	0.75	0.16	ND	0.35	0.072	
75-35-4	1,1-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
75-09-2	Methylene Chloride	ND	0.75	0.21	ND	0.22	0.061	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	0.10	ND	0.25	0.033	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.60**	0.77	0.11	**0.078**	0.10	0.014	**J**
75-15-0	Carbon Disulfide	**0.85**	1.6	0.23	**0.27**	0.50	0.073	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
75-34-3	1,1-Dichloroethane	ND	0.16	0.11	ND	0.039	0.027	
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	0.089	ND	0.21	0.025	
108-05-4	Vinyl Acetate	ND	7.7	1.7	ND	2.2	0.48	
78-93-3	2-Butanone (MEK)	**0.55**	1.6	0.16	**0.19**	0.53	0.053	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-002

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00982

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
141-78-6	Ethyl Acetate	**0.98**	1.6	0.40	**0.27**	0.43	0.11	**J**
110-54-3	n-Hexane	**13**	0.77	0.16	**3.6**	0.22	0.044	
67-66-3	Chloroform	**0.27**	0.16	0.10	**0.054**	0.032	0.021	
109-99-9	Tetrahydrofuran (THF)	ND	0.78	0.095	ND	0.26	0.032	
107-06-2	1,2-Dichloroethane	ND	0.16	0.084	ND	0.039	0.021	
71-55-6	1,1,1-Trichloroethane	ND	0.16	0.094	ND	0.029	0.017	
71-43-2	Benzene	**1.1**	0.16	0.11	**0.35**	0.049	0.034	
56-23-5	Carbon Tetrachloride	**0.24**	0.16	0.11	**0.038**	0.025	0.017	
110-82-7	Cyclohexane	**15**	1.6	0.21	**4.3**	0.45	0.062	
78-87-5	1,2-Dichloropropane	ND	0.16	0.094	ND	0.034	0.020	
75-27-4	Bromodichloromethane	ND	0.16	0.11	ND	0.023	0.016	
79-01-6	Trichloroethene	ND	0.16	0.10	ND	0.029	0.019	
123-91-1	1,4-Dioxane	ND	0.77	0.089	ND	0.21	0.025	
80-62-6	Methyl Methacrylate	ND	1.6	0.27	ND	0.38	0.066	
142-82-5	n-Heptane	**8.0**	0.77	0.12	**2.0**	0.19	0.029	
10061-01-5	cis-1,3-Dichloropropene	ND	0.74	0.12	ND	0.16	0.026	
108-10-1	4-Methyl-2-pentanone	**0.23**	0.75	0.10	**0.056**	0.18	0.025	**J**
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	0.16	ND	0.17	0.034	
79-00-5	1,1,2-Trichloroethane	ND	0.16	0.077	ND	0.029	0.014	
108-88-3	Toluene	**2.7**	0.77	0.092	**0.71**	0.20	0.025	
591-78-6	2-Hexanone	ND	0.77	0.094	ND	0.19	0.023	
124-48-1	Dibromochloromethane	ND	0.16	0.099	ND	0.018	0.012	
106-93-4	1,2-Dibromoethane	ND	0.16	0.088	ND	0.020	0.011	
123-86-4	n-Butyl Acetate	ND	0.78	0.10	ND	0.16	0.022	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-002

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00982

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	**4.4**	0.77	0.17	**0.95**	0.16	0.036	
127-18-4	Tetrachloroethene	**0.42**	0.14	0.098	**0.061**	0.021	0.014	
108-90-7	Chlorobenzene	ND	0.77	0.10	ND	0.17	0.022	
100-41-4	Ethylbenzene	**0.41**	0.77	0.11	**0.094**	0.18	0.025	**J**
179601-23-1	m,p-Xylenes	**2.2**	1.6	0.20	**0.50**	0.36	0.046	
75-25-2	Bromoform	ND	0.77	0.16	ND	0.074	0.015	
100-42-5	Styrene	ND	0.75	0.12	ND	0.18	0.029	
95-47-6	o-Xylene	**0.84**	0.77	0.11	**0.19**	0.18	0.025	
111-84-2	n-Nonane	**2.2**	0.77	0.13	**0.43**	0.15	0.024	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.16	0.11	ND	0.023	0.015	
98-82-8	Cumene	**0.13**	0.77	0.11	**0.027**	0.16	0.022	**J**
80-56-8	alpha-Pinene	**0.58**	0.77	0.12	**0.10**	0.14	0.021	**J**
103-65-1	n-Propylbenzene	**0.14**	0.77	0.11	**0.029**	0.16	0.022	**J**
622-96-8	4-Ethyltoluene	ND	0.77	0.12	ND	0.16	0.025	
108-67-8	1,3,5-Trimethylbenzene	**0.39**	0.75	0.11	**0.079**	0.15	0.022	**J**
95-63-6	1,2,4-Trimethylbenzene	**0.70**	0.75	0.11	**0.14**	0.15	0.021	**J**
100-44-7	Benzyl Chloride	ND	1.6	0.17	ND	0.30	0.033	
541-73-1	1,3-Dichlorobenzene	ND	0.77	0.11	ND	0.13	0.019	
106-46-7	1,4-Dichlorobenzene	ND	0.77	0.12	ND	0.13	0.019	
95-50-1	1,2-Dichlorobenzene	ND	0.77	0.11	ND	0.13	0.019	
5989-27-5	d-Limonene	**1.2**	0.77	0.16	**0.21**	0.14	0.028	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	0.14	ND	0.078	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	0.18	ND	0.10	0.025	
91-20-3	Naphthalene	ND	0.74	0.18	ND	0.14	0.035	
87-68-3	Hexachlorobutadiene	ND	0.75	0.16	ND	0.071	0.015	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-003

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01087

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**0.96**	0.72	0.18	**0.56**	0.42	0.10	
75-71-8	Dichlorodifluoromethane (CFC 12)	**1.9**	0.72	0.12	**0.39**	0.15	0.024	
74-87-3	Chloromethane	ND	0.29	0.12	ND	0.14	0.057	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	0.11	ND	0.10	0.016	
75-01-4	Vinyl Chloride	ND	0.15	0.078	ND	0.059	0.030	
106-99-0	1,3-Butadiene	ND	0.29	0.12	ND	0.13	0.054	
74-83-9	Bromomethane	ND	0.30	0.10	ND	0.077	0.026	
75-00-3	Chloroethane	ND	0.30	0.090	ND	0.11	0.034	
64-17-5	Ethanol	**1.8**	7.1	0.50	**0.95**	3.8	0.27	**J**
75-05-8	Acetonitrile	ND	0.72	0.18	ND	0.43	0.11	
107-02-8	Acrolein	ND	1.4	0.20	ND	0.59	0.089	
67-64-1	Acetone	**2.7**	7.2	1.6	**1.1**	3.0	0.69	**J**
75-69-4	Trichlorofluoromethane (CFC 11)	**1.0**	0.72	0.11	**0.18**	0.13	0.020	
67-63-0	2-Propanol (Isopropyl Alcohol)	**3.4**	2.9	0.30	**1.4**	1.2	0.12	
107-13-1	Acrylonitrile	ND	0.72	0.15	ND	0.33	0.069	
75-35-4	1,1-Dichloroethene	ND	0.15	0.10	ND	0.038	0.025	
75-09-2	Methylene Chloride	ND	0.72	0.20	ND	0.21	0.059	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.73	0.098	ND	0.23	0.031	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.46**	0.73	0.10	**0.059**	0.096	0.013	**J**
75-15-0	Carbon Disulfide	**0.33**	1.5	0.22	**0.11**	0.48	0.070	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.15	0.10	ND	0.038	0.025	
75-34-3	1,1-Dichloroethane	ND	0.15	0.11	ND	0.037	0.026	
1634-04-4	Methyl tert-Butyl Ether	ND	0.73	0.086	ND	0.20	0.024	
108-05-4	Vinyl Acetate	ND	7.3	1.6	ND	2.1	0.46	
78-93-3	2-Butanone (MEK)	**0.31**	1.5	0.15	**0.11**	0.51	0.051	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-003

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01087

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.15	0.10	ND	0.038	0.026	
141-78-6	Ethyl Acetate	**0.79**	1.5	0.38	**0.22**	0.42	0.11	**J**
110-54-3	n-Hexane	ND	0.73	0.15	ND	0.21	0.042	
67-66-3	Chloroform	ND	0.15	0.097	ND	0.031	0.020	
109-99-9	Tetrahydrofuran (THF)	ND	0.75	0.091	ND	0.25	0.031	
107-06-2	1,2-Dichloroethane	ND	0.15	0.080	ND	0.037	0.020	
71-55-6	1,1,1-Trichloroethane	ND	0.15	0.090	ND	0.027	0.016	
71-43-2	Benzene	**0.14**	0.15	0.10	**0.045**	0.047	0.033	**J**
56-23-5	Carbon Tetrachloride	**0.36**	0.15	0.10	**0.057**	0.024	0.016	
110-82-7	Cyclohexane	ND	1.5	0.20	ND	0.43	0.059	
78-87-5	1,2-Dichloropropane	ND	0.15	0.090	ND	0.032	0.019	
75-27-4	Bromodichloromethane	ND	0.15	0.10	ND	0.022	0.016	
79-01-6	Trichloroethene	**0.19**	0.15	0.098	**0.036**	0.028	0.018	
123-91-1	1,4-Dioxane	ND	0.73	0.086	ND	0.20	0.024	
80-62-6	Methyl Methacrylate	ND	1.5	0.26	ND	0.37	0.063	
142-82-5	n-Heptane	ND	0.73	0.12	ND	0.18	0.028	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	0.11	ND	0.16	0.025	
108-10-1	4-Methyl-2-pentanone	ND	0.72	0.099	ND	0.18	0.024	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	0.15	ND	0.16	0.033	
79-00-5	1,1,2-Trichloroethane	ND	0.15	0.073	ND	0.027	0.013	
108-88-3	Toluene	**0.21**	0.73	0.088	**0.057**	0.19	0.023	**J**
591-78-6	2-Hexanone	ND	0.73	0.090	ND	0.18	0.022	
124-48-1	Dibromochloromethane	ND	0.15	0.095	ND	0.018	0.011	
106-93-4	1,2-Dibromoethane	ND	0.15	0.084	ND	0.019	0.011	
123-86-4	n-Butyl Acetate	ND	0.75	0.099	ND	0.16	0.021	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-003

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01087

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.73	0.16	ND	0.16	0.035	
127-18-4	Tetrachloroethene	ND	0.14	0.094	ND	0.020	0.014	
108-90-7	Chlorobenzene	ND	0.73	0.097	ND	0.16	0.021	
100-41-4	Ethylbenzene	ND	0.73	0.10	ND	0.17	0.023	
179601-23-1	m,p-Xylenes	ND	1.5	0.19	ND	0.34	0.044	
75-25-2	Bromoform	ND	0.73	0.15	ND	0.071	0.014	
100-42-5	Styrene	ND	0.72	0.12	ND	0.17	0.027	
95-47-6	o-Xylene	ND	0.73	0.10	ND	0.17	0.024	
111-84-2	n-Nonane	ND	0.73	0.12	ND	0.14	0.023	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.15	0.10	ND	0.022	0.015	
98-82-8	Cumene	ND	0.73	0.10	ND	0.15	0.021	
80-56-8	alpha-Pinene	**0.11**	0.73	0.11	**0.021**	0.13	0.020	**J**
103-65-1	n-Propylbenzene	ND	0.73	0.10	ND	0.15	0.021	
622-96-8	4-Ethyltoluene	ND	0.73	0.12	ND	0.15	0.024	
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	0.10	ND	0.15	0.021	
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	0.10	ND	0.15	0.020	
100-44-7	Benzyl Chloride	ND	1.5	0.16	ND	0.29	0.032	
541-73-1	1,3-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.018	
106-46-7	1,4-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.019	
95-50-1	1,2-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.018	
5989-27-5	d-Limonene	ND	0.73	0.15	ND	0.13	0.027	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	0.14	ND	0.075	0.014	
120-82-1	1,2,4-Trichlorobenzene	ND	0.73	0.18	ND	0.099	0.024	
91-20-3	Naphthalene	ND	0.71	0.18	ND	0.13	0.034	
87-68-3	Hexachlorobutadiene	ND	0.72	0.15	ND	0.068	0.014	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**

Client Sample ID: **Method Blank** ALS Project ID: P1906559

Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA

Analyst: Lusine Hakobyan Date Analyzed: 11/16/19

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	ND	0.53	0.13	ND	0.31	0.076	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.53	0.087	ND	0.11	0.018	
74-87-3	Chloromethane	ND	0.21	0.086	ND	0.10	0.042	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.53	0.084	ND	0.076	0.012	
75-01-4	Vinyl Chloride	ND	0.11	0.057	ND	0.043	0.022	
106-99-0	1,3-Butadiene	ND	0.21	0.088	ND	0.095	0.040	
74-83-9	Bromomethane	ND	0.22	0.074	ND	0.057	0.019	
75-00-3	Chloroethane	ND	0.22	0.066	ND	0.083	0.025	
64-17-5	Ethanol	ND	5.2	0.37	ND	2.8	0.20	
75-05-8	Acetonitrile	ND	0.53	0.13	ND	0.32	0.077	
107-02-8	Acrolein	ND	1.0	0.15	ND	0.44	0.065	
67-64-1	Acetone	ND	5.3	1.2	ND	2.2	0.51	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.53	0.081	ND	0.094	0.014	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.1	0.22	ND	0.85	0.090	
107-13-1	Acrylonitrile	ND	0.53	0.11	ND	0.24	0.051	
75-35-4	1,1-Dichloroethene	ND	0.11	0.074	ND	0.028	0.019	
75-09-2	Methylene Chloride	ND	0.53	0.15	ND	0.15	0.043	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.54	0.072	ND	0.17	0.023	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.54	0.076	ND	0.070	0.0099	
75-15-0	Carbon Disulfide	ND	1.1	0.16	ND	0.35	0.051	
156-60-5	trans-1,2-Dichloroethene	ND	0.11	0.074	ND	0.028	0.019	
75-34-3	1,1-Dichloroethane	ND	0.11	0.078	ND	0.027	0.019	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	0.063	ND	0.15	0.017	
108-05-4	Vinyl Acetate	ND	5.4	1.2	ND	1.5	0.34	
78-93-3	2-Butanone (MEK)	ND	1.1	0.11	ND	0.37	0.037	

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

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **Unicorn Management Consultants**

Client Sample ID: **Method Blank** ALS Project ID: P1906559

Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA

Analyst: Lusine Hakobyan Date Analyzed: 11/16/19

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.11	0.075	ND	0.028	0.019	
141-78-6	Ethyl Acetate	ND	1.1	0.28	ND	0.31	0.078	
110-54-3	n-Hexane	ND	0.54	0.11	ND	0.15	0.031	
67-66-3	Chloroform	ND	0.11	0.071	ND	0.023	0.015	
109-99-9	Tetrahydrofuran (THF)	ND	0.55	0.067	ND	0.19	0.023	
107-06-2	1,2-Dichloroethane	ND	0.11	0.059	ND	0.027	0.015	
71-55-6	1,1,1-Trichloroethane	ND	0.11	0.066	ND	0.020	0.012	
71-43-2	Benzene	ND	0.11	0.077	ND	0.034	0.024	
56-23-5	Carbon Tetrachloride	ND	0.11	0.074	ND	0.017	0.012	
110-82-7	Cyclohexane	ND	1.1	0.15	ND	0.32	0.044	
78-87-5	1,2-Dichloropropane	ND	0.11	0.066	ND	0.024	0.014	
75-27-4	Bromodichloromethane	ND	0.11	0.077	ND	0.016	0.011	
79-01-6	Trichloroethene	ND	0.11	0.072	ND	0.020	0.013	
123-91-1	1,4-Dioxane	ND	0.54	0.063	ND	0.15	0.017	
80-62-6	Methyl Methacrylate	ND	1.1	0.19	ND	0.27	0.046	
142-82-5	n-Heptane	ND	0.54	0.085	ND	0.13	0.021	
10061-01-5	cis-1,3-Dichloropropene	ND	0.52	0.083	ND	0.11	0.018	
108-10-1	4-Methyl-2-pentanone	ND	0.53	0.073	ND	0.13	0.018	
10061-02-6	trans-1,3-Dichloropropene	ND	0.53	0.11	ND	0.12	0.024	
79-00-5	1,1,2-Trichloroethane	ND	0.11	0.054	ND	0.020	0.0099	
108-88-3	Toluene	ND	0.54	0.065	ND	0.14	0.017	
591-78-6	2-Hexanone	ND	0.54	0.066	ND	0.13	0.016	
124-48-1	Dibromochloromethane	ND	0.11	0.070	ND	0.013	0.0082	
106-93-4	1,2-Dibromoethane	ND	0.11	0.062	ND	0.014	0.0081	
123-86-4	n-Butyl Acetate	ND	0.55	0.073	ND	0.12	0.015	

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

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

Client: **Unicorn Management Consultants**

Client Sample ID: **Method Blank** ALS Project ID: P1906559

Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-MB

Test Code: EPA TO-15 Date Collected: NA

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA

Analyst: Lusine Hakobyan Date Analyzed: 11/16/19

Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Canister Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.54	0.12	ND	0.12	0.026	
127-18-4	Tetrachloroethene	ND	0.10	0.069	ND	0.015	0.010	
108-90-7	Chlorobenzene	ND	0.54	0.071	ND	0.12	0.015	
100-41-4	Ethylbenzene	ND	0.54	0.075	ND	0.12	0.017	
179601-23-1	m,p-Xylenes	ND	1.1	0.14	ND	0.25	0.032	
75-25-2	Bromoform	ND	0.54	0.11	ND	0.052	0.011	
100-42-5	Styrene	ND	0.53	0.086	ND	0.12	0.020	
95-47-6	o-Xylene	ND	0.54	0.077	ND	0.12	0.018	
111-84-2	n-Nonane	ND	0.54	0.089	ND	0.10	0.017	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.11	0.074	ND	0.016	0.011	
98-82-8	Cumene	ND	0.54	0.077	ND	0.11	0.016	
80-56-8	alpha-Pinene	ND	0.54	0.082	ND	0.097	0.015	
103-65-1	n-Propylbenzene	ND	0.54	0.077	ND	0.11	0.016	
622-96-8	4-Ethyltoluene	ND	0.54	0.085	ND	0.11	0.017	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	0.077	ND	0.11	0.016	
95-63-6	1,2,4-Trimethylbenzene	ND	0.53	0.074	ND	0.11	0.015	
100-44-7	Benzyl Chloride	ND	1.1	0.12	ND	0.21	0.023	
541-73-1	1,3-Dichlorobenzene	ND	0.54	0.080	ND	0.090	0.013	
106-46-7	1,4-Dichlorobenzene	ND	0.54	0.082	ND	0.090	0.014	
95-50-1	1,2-Dichlorobenzene	ND	0.54	0.079	ND	0.090	0.013	
5989-27-5	d-Limonene	ND	0.54	0.11	ND	0.097	0.020	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.53	0.10	ND	0.055	0.010	
120-82-1	1,2,4-Trichlorobenzene	ND	0.54	0.13	ND	0.073	0.018	
91-20-3	Naphthalene	ND	0.52	0.13	ND	0.099	0.025	
87-68-3	Hexachlorobutadiene	ND	0.53	0.11	ND	0.050	0.010	

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

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Unicorn Management Consultants**
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Project ID: P1906559

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date(s) Collected: 10/23/19
Analyst: Lusine Hakobyan Date(s) Received: 10/29/19
Sample Type: 6.0 L Silonite Canister(s) Date(s) Analyzed: 11/16/19
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P191116-MB	**99**	**100**	**106**	70-130	
Lab Control Sample	P191116-LCS	**94**	**101**	**102**	70-130	
G07-04	P1906559-001	**92**	**100**	**108**	70-130	
G07-04	P1906559-001DUP	**93**	**101**	**109**	70-130	
Dup102319	P1906559-002	**92**	**100**	**109**	70-130	
G07-Outdoor	P1906559-003	**93**	**101**	**109**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Unicorn Management Consultants**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	210	**180**	**86**	53-112	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	**192**	**91**	62-103	
74-87-3	Chloromethane	212	**137**	**65**	51-121	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	206	**192**	**93**	56-111	
75-01-4	Vinyl Chloride	212	**189**	**89**	57-117	
106-99-0	1,3-Butadiene	212	**217**	**102**	53-134	
74-83-9	Bromomethane	212	**175**	**83**	65-110	
75-00-3	Chloroethane	214	**169**	**79**	64-111	
64-17-5	Ethanol	1,060	**890**	**84**	57-124	
75-05-8	Acetonitrile	214	**185**	**86**	57-126	
107-02-8	Acrolein	206	**187**	**91**	62-121	
67-64-1	Acetone	1,070	**910**	**85**	60-113	
75-69-4	Trichlorofluoromethane (CFC 11)	212	**192**	**91**	63-104	
67-63-0	2-Propanol (Isopropyl Alcohol)	422	**395**	**94**	60-124	
107-13-1	Acrylonitrile	212	**197**	**93**	66-125	
75-35-4	1,1-Dichloroethene	214	**193**	**90**	68-107	
75-09-2	Methylene Chloride	210	**178**	**85**	66-105	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	214	**183**	**86**	63-127	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	**191**	**88**	59-109	
75-15-0	Carbon Disulfide	212	**189**	**89**	67-109	
156-60-5	trans-1,2-Dichloroethene	214	**190**	**89**	70-115	
75-34-3	1,1-Dichloroethane	212	**177**	**83**	66-106	
1634-04-4	Methyl tert-Butyl Ether	214	**237**	**111**	67-109	**L**
108-05-4	Vinyl Acetate	1,070	**1330**	**124**	68-136	
78-93-3	2-Butanone (MEK)	212	**201**	**95**	71-116	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.
L = Laboratory control sample recovery outside the specified limits, results may be biased high.

Client: **Unicorn Management Consultants**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
156-59-2	cis-1,2-Dichloroethene	212	**190**	**90**	67-110	
141-78-6	Ethyl Acetate	432	**406**	**94**	64-127	
110-54-3	n-Hexane	216	**183**	**85**	60-115	
67-66-3	Chloroform	214	**186**	**87**	66-105	
109-99-9	Tetrahydrofuran (THF)	220	**201**	**91**	65-110	
107-06-2	1,2-Dichloroethane	214	**191**	**89**	60-110	
71-55-6	1,1,1-Trichloroethane	214	**215**	**100**	64-108	
71-43-2	Benzene	210	**183**	**87**	67-106	
56-23-5	Carbon Tetrachloride	208	**221**	**106**	64-112	
110-82-7	Cyclohexane	422	**398**	**94**	67-110	
78-87-5	1,2-Dichloropropane	214	**197**	**92**	66-112	
75-27-4	Bromodichloromethane	218	**214**	**98**	67-113	
79-01-6	Trichloroethene	216	**201**	**93**	66-108	
123-91-1	1,4-Dioxane	216	**216**	**100**	70-116	
80-62-6	Methyl Methacrylate	430	**442**	**103**	73-118	
142-82-5	n-Heptane	214	**199**	**93**	66-110	
10061-01-5	cis-1,3-Dichloropropene	214	**233**	**109**	75-120	
108-10-1	4-Methyl-2-pentanone	212	**208**	**98**	65-124	
10061-02-6	trans-1,3-Dichloropropene	212	**232**	**109**	77-123	
79-00-5	1,1,2-Trichloroethane	214	**206**	**96**	68-112	
108-88-3	Toluene	212	**219**	**103**	62-111	
591-78-6	2-Hexanone	216	**225**	**104**	59-128	
124-48-1	Dibromochloromethane	214	**238**	**111**	67-123	
106-93-4	1,2-Dibromoethane	214	**227**	**106**	66-122	
123-86-4	n-Butyl Acetate	218	**233**	**107**	64-128	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

Client: **Unicorn Management Consultants**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P191116-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: NA
Analyst: Lusine Hakobyan Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	**Result µg/m³**	**% Recovery**	ALS Acceptance Limits	**Data Qualifier**
111-65-9	n-Octane	216	**207**	**96**	65-114	
127-18-4	Tetrachloroethene	208	**209**	**100**	55-120	
108-90-7	Chlorobenzene	214	**202**	**94**	61-114	
100-41-4	Ethylbenzene	212	**209**	**99**	64-113	
179601-23-1	m,p-Xylenes	426	**402**	**94**	64-114	
75-25-2	Bromoform	214	**252**	**118**	65-132	
100-42-5	Styrene	212	**224**	**106**	67-124	
95-47-6	o-Xylene	214	**205**	**96**	65-114	
111-84-2	n-Nonane	214	**205**	**96**	64-117	
79-34-5	1,1,2,2-Tetrachloroethane	214	**210**	**98**	66-119	
98-82-8	Cumene	214	**214**	**100**	61-116	
80-56-8	alpha-Pinene	212	**216**	**102**	65-120	
103-65-1	n-Propylbenzene	214	**207**	**97**	63-117	
622-96-8	4-Ethyltoluene	210	**208**	**99**	63-124	
108-67-8	1,3,5-Trimethylbenzene	212	**201**	**95**	60-117	
95-63-6	1,2,4-Trimethylbenzene	212	**204**	**96**	61-122	
100-44-7	Benzyl Chloride	214	**281**	**131**	77-142	
541-73-1	1,3-Dichlorobenzene	214	**202**	**94**	61-125	
106-46-7	1,4-Dichlorobenzene	214	**204**	**95**	59-123	
95-50-1	1,2-Dichlorobenzene	214	**207**	**97**	61-126	
5989-27-5	d-Limonene	212	**196**	**92**	66-124	
96-12-8	1,2-Dibromo-3-chloropropane	214	**240**	**112**	67-138	
120-82-1	1,2,4-Trichlorobenzene	216	**226**	**105**	62-141	
91-20-3	Naphthalene	212	**205**	**97**	62-145	
87-68-3	Hexachlorobutadiene	214	**210**	**98**	49-131	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001DUP

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result µg/m³	Duplicate Sample Result ppbV	Average µg/m³	% RPD	RPD Limit	Data Qualifier
Propene	2.44	1.42	2.50	1.45	2.47	**2**	25	
Dichlorodifluoromethane (CFC 12)	2.41	0.488	2.38	0.481	2.395	**1**	25	
Chloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	ND	ND	ND	-	-	25	
Vinyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Butadiene	ND	ND	ND	ND	-	-	25	
Bromomethane	ND	ND	ND	ND	-	-	25	
Chloroethane	ND	ND	ND	ND	-	-	25	
Ethanol	36.0	19.1	36.0	19.1	36	**0**	25	
Acetonitrile	ND	ND	ND	ND	-	-	25	
Acrolein	ND	ND	ND	ND	-	-	25	
Acetone	12.2	5.15	12.3	5.18	12.25	**0.8**	25	
Trichlorofluoromethane	1.81	0.321	1.81	0.323	1.81	**0**	25	
2-Propanol (Isopropyl Alcohol)	7.33	2.98	7.15	2.91	7.24	**2**	25	
Acrylonitrile	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethene	ND	ND	ND	ND	-	-	25	
Methylene Chloride	ND	ND	ND	ND	-	-	25	
3-Chloro-1-propene (Allyl Chloride)	ND	ND	ND	ND	-	-	25	
Trichlorotrifluoroethane	0.609	0.0794	0.616	0.0804	0.6125	**1**	25	**J**
Carbon Disulfide	0.871	0.280	0.868	0.279	0.8695	**0.3**	25	**J**
trans-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
1,1-Dichloroethane	ND	ND	ND	ND	-	-	25	
Methyl tert-Butyl Ether	ND	ND	ND	ND	-	-	25	
Vinyl Acetate	ND	ND	ND	ND	-	-	25	
2-Butanone (MEK)	0.690	0.234	0.713	0.242	0.7015	**3**	25	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001DUP

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result **µg/m³**	Duplicate Sample Result **ppbV**	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
cis-1,2-Dichloroethene	ND	ND	ND	ND	-	-	25	
Ethyl Acetate	0.894	0.248	0.929	0.258	0.9115	**4**	25	**J**
n-Hexane	12.8	3.62	12.8	3.64	12.8	**0**	25	
Chloroform	0.263	0.0538	0.264	0.0541	0.2635	**0.4**	25	
Tetrahydrofuran (THF)	ND	ND	ND	ND	-	-	25	
1,2-Dichloroethane	ND	ND	ND	ND	-	-	25	
1,1,1-Trichloroethane	ND	ND	ND	ND	-	-	25	
Benzene	1.07	0.335	1.07	0.335	1.07	**0**	25	
Carbon Tetrachloride	0.225	0.0358	0.231	0.0367	0.228	**3**	25	
Cyclohexane	14.9	4.33	14.7	4.28	14.8	**1**	25	
1,2-Dichloropropane	ND	ND	ND	ND	-	-	25	
Bromodichloromethane	ND	ND	ND	ND	-	-	25	
Trichloroethene	ND	ND	ND	ND	-	-	25	
1,4-Dioxane	ND	ND	ND	ND	-	-	25	
Methyl Methacrylate	ND	ND	ND	ND	-	-	25	
n-Heptane	8.03	1.96	7.88	1.92	7.955	**2**	25	
cis-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
4-Methyl-2-pentanone	0.438	0.107	0.430	0.105	0.434	**2**	25	**J**
trans-1,3-Dichloropropene	ND	ND	ND	ND	-	-	25	
1,1,2-Trichloroethane	ND	ND	ND	ND	-	-	25	
Toluene	2.40	0.637	2.43	0.646	2.415	**1**	25	
2-Hexanone	ND	ND	ND	ND	-	-	25	
Dibromochloromethane	ND	ND	ND	ND	-	-	25	
1,2-Dibromoethane	ND	ND	ND	ND	-	-	25	
n-Butyl Acetate	0.714	0.150	0.720	0.152	0.717	**0.8**	25	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

LABORATORY DUPLICATE SUMMARY RESULTS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001DUP

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

Compound	Sample Result µg/m³	Sample Result ppbV	Duplicate Sample Result **µg/m³**	Duplicate Sample Result **ppbV**	Average µg/m³	**% RPD**	RPD Limit	**Data Qualifier**
n-Octane	4.48	0.960	4.57	0.978	4.525	**2**	25	
Tetrachloroethene	0.396	0.0584	0.400	0.0590	0.398	**1**	25	
Chlorobenzene	ND	ND	ND	ND	-	-	25	
Ethylbenzene	0.681	0.157	0.693	0.160	0.687	**2**	25	**J**
m,p-Xylenes	3.47	0.799	3.52	0.811	3.495	**1**	25	
Bromoform	ND	ND	ND	ND	-	-	25	
Styrene	ND	ND	ND	ND	-	-	25	
o-Xylene	1.02	0.235	1.05	0.243	1.035	**3**	25	
n-Nonane	2.21	0.421	2.26	0.432	2.235	**2**	25	
1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	-	-	25	
Cumene	0.116	0.0237	0.122	0.0249	0.119	**5**	25	**J**
alpha-Pinene	0.596	0.107	0.622	0.112	0.609	**4**	25	**J**
n-Propylbenzene	ND	ND	ND	ND	-	-	25	
4-Ethyltoluene	ND	ND	ND	ND	-	-	25	
1,3,5-Trimethylbenzene	0.322	0.0654	0.334	0.0679	0.328	**4**	25	**J**
1,2,4-Trimethylbenzene	0.451	0.0919	0.462	0.0940	0.4565	**2**	25	**J**
Benzyl Chloride	ND	ND	ND	ND	-	-	25	
1,3-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,4-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
1,2-Dichlorobenzene	ND	ND	ND	ND	-	-	25	
d-Limonene	1.24	0.222	1.33	0.238	1.285	**7**	25	
1,2-Dibromo-3-chloropropane	ND	ND	ND	ND	-	-	25	
1,2,4-Trichlorobenzene	ND	ND	ND	ND	-	-	25	
Naphthalene	ND	ND	ND	ND	-	-	25	
Hexachlorobutadiene	ND	ND	ND	ND	-	-	25	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants** ALS Project ID: P1906559

Client Project ID: **LVRR Soil Gas / 2032-770**

Internal Standard Area and RT Summary

Test Code: EPA TO-15

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Lab File ID: 11161901.D

Analyst: Lusine Hakobyan Date Analyzed: 11/16/19

Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 00:48

Test Notes:

		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	24 Hour Standard	249043	11.17	990629	13.30	488858	17.61
	Upper Limit	348660	11.50	1386881	13.63	684401	17.94
	Lower Limit	149426	10.84	594377	12.97	293315	17.28
	Client Sample ID						
01	Method Blank	235422	11.16	936407	13.29	431546	17.61
02	Lab Control Sample	241943	11.17	957392	13.30	462843	17.61
03	G07-04	243337	11.16	1002340	13.29	463998	17.61
04	G07-04 (Lab Duplicate)	239703	11.15	998462	13.29	451638	17.61
05	Dup102319	240757	11.16	991941	13.29	460383	17.61
06	G07-Outdoor	238928	11.15	1005604	13.29	456267	17.61
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the specified limits.

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161916.D
Acq On : 16 Nov 2019 11:57 Operator: WA
Sample : P1906559-001 (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 14:54:51 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	243337	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	1002340	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	463998	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	358327	11.506	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.08%				
57) Toluene-d8 (SS2)	15.74	98	1016125	12.515	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.08%				
73) Bromofluorobenzene (SS3)	19.00	174	390948	13.478	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 107.84%				
Target Compounds							Qvalue
2) Propene	4.10	42	66313	1.613	ng		97
3) Dichlorodifluoromethan...	4.27	85	80609	1.596	ng		100
4) Chloromethane	4.55	50	277	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1867	0.075	ng		90
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	5.23	54	668	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.32	45	560169	23.845	ng		100
11) Acetonitrile	6.60	41	3959	0.068	ng		93
12) Acrolein	6.80	56	2181	0.117	ng		100
13) Acetone	7.00	58	177169	8.105	ng	#	68
14) Trichlorofluoromethane	7.26	101	51653	1.196	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	303127	4.856	ng		100
16) Acrylonitrile	0.00	53	0	N.D. d			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D. d			
19) Methylene Chloride	8.43	84	1817	0.067	ng		95
20) 3-Chloro-1-propene (Al...	8.63	41	104	N.D.			
21) Trichlorotrifluoroethane	8.86	151	8931	0.403	ng		97
22) Carbon Disulfide	8.71	76	55269	0.577	ng		98
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	10.01	63	945	N.D.			
25) Methyl tert-Butyl Ether	10.12	73	249	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D. d			
27) 2-Butanone (MEK)	10.48	72	7954	0.457	ng		96
28) cis-1,2-Dichloroethene	10.98	61	291	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D. d			
30) Ethyl Acetate	11.30	61	5441	0.592	ng	#	28
31) n-Hexane	11.28	57	373092	8.444	ng		99
32) Chloroform	11.33	83	7458	0.174	ng		98
34) Tetrahydrofuran (THF)	11.78	72	224	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.15	62	982	N.D.			
38) 1,1,1-Trichloroethane	12.42	97	156	N.D.			
39) Isopropyl Acetate	12.90	61	300	N.D.			
40) 1-Butanol	0.00	56	0	N.D. d			
41) Benzene	12.90	78	71861	0.708	ng		99
42) Carbon Tetrachloride	13.06	117	4403	0.149	ng		96
43) Cyclohexane	13.19	84	372082	9.869	ng		98
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	13.89	63	176	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D. d			
47) Trichloroethene	14.00	130	682	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D. d			

Data File: I:\MS16\DATA\2019_11\16\11161916.D
Acq On : 16 Nov 2019 11:57 Operator: WA
Sample : P1906559-001 (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 14:54:51 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

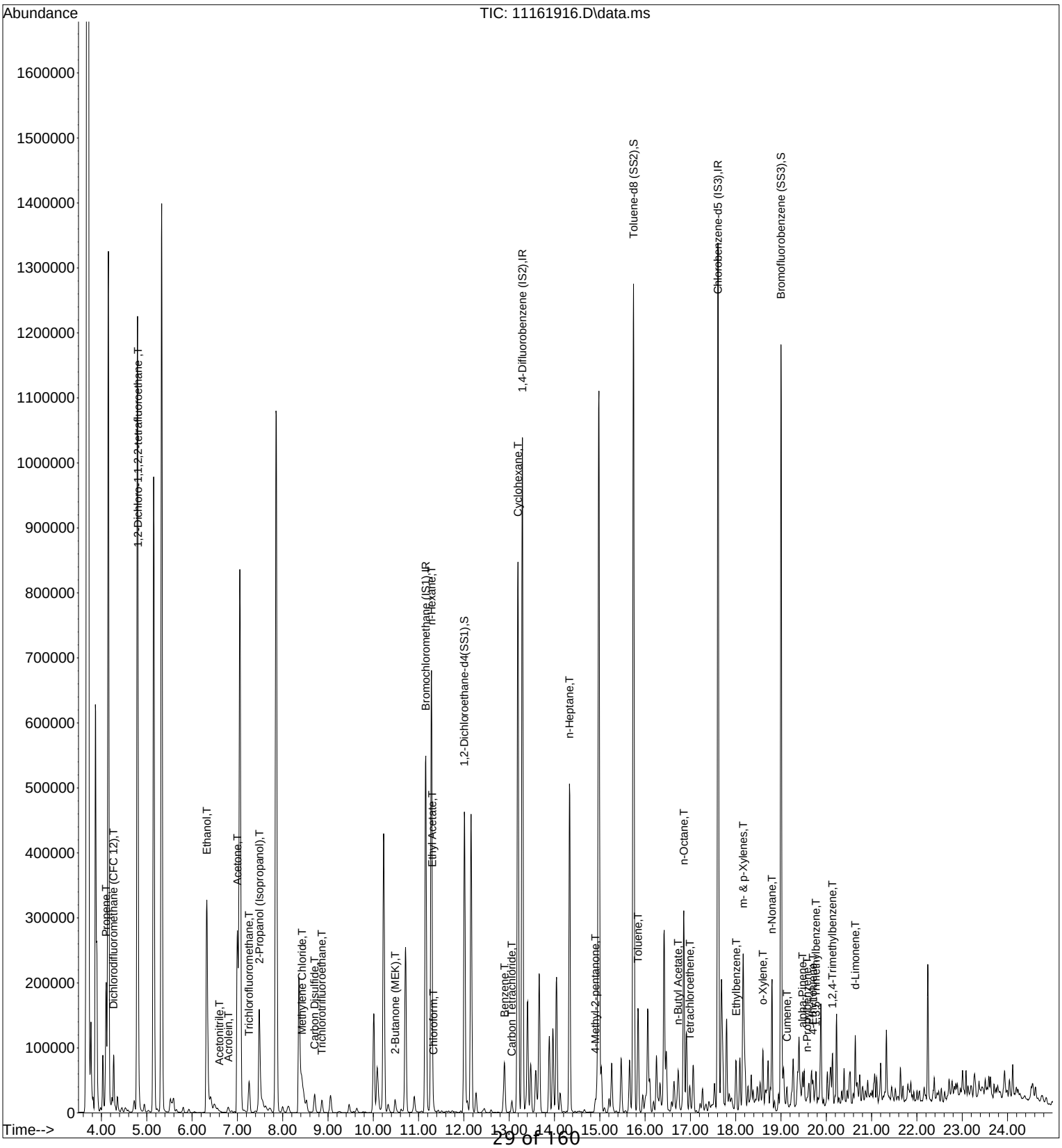
Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	14.21	100	105	N.D.		
51) n-Heptane	14.33	71	135181	5.317 ng		98
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.90	58	6959	0.290 ng		98
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D. d		
58) Toluene	15.84	91	136190	1.590 ng		100
59) 2-Hexanone	0.00	43	0	N.D. d		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.73	43	30427	0.473 ng	#	69
63) n-Octane	16.86	57	64902	2.968 ng		99
64) Tetrachloroethene	16.99	166	6714	0.262 ng		97
65) Chlorobenzene	0.00	112	0	N.D. d		
66) Ethylbenzene	18.01	91	46995	0.451 ng		99
67) m- & p-Xylenes	18.16	91	179132	2.297 ng		97
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.50	104	882	N.D.		
70) o-Xylene	18.60	91	50046	0.677 ng		100
71) n-Nonane	18.80	43	77234	1.461 ng		98
72) 1,1,2,2-Tetrachloroethane	18.61	83	244	N.D.		
74) Cumene	19.13	105	7468	0.077 ng		97
75) alpha-Pinene	19.48	93	18973	0.395 ng		95
76) n-Propylbenzene	19.58	91	8903	0.073 ng		82
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	19.70	105	5084	0.059 ng		94
79) 1,3,5-Trimethylbenzene	19.77	105	16895	0.213 ng		99
80) alpha-Methylstyrene	19.91	118	547	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	20.13	105	23108	0.299 ng		88
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	20.25	91	735	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	143	N.D.		
86) 1,4-Dichlorobenzene	20.32	146	143	N.D.		
87) sec-Butylbenzene	20.37	105	3622	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D. d		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D. d		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.64	68	23844	0.818 ng		87
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	22.15	180	172	N.D.		
95) Naphthalene	22.24	128	2779	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	0.00	119	0	N.D. d		
100) n-Butylbenzene	20.87	91	3054	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161916.D
Acq On : 16 Nov 2019 11:57 Operator: WA
Sample : P1906559-001 (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 14:54:51 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161916.D
Acq On : 16 Nov 2019 11:57 Operator: WA
Sample : P1906559-001 (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

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Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

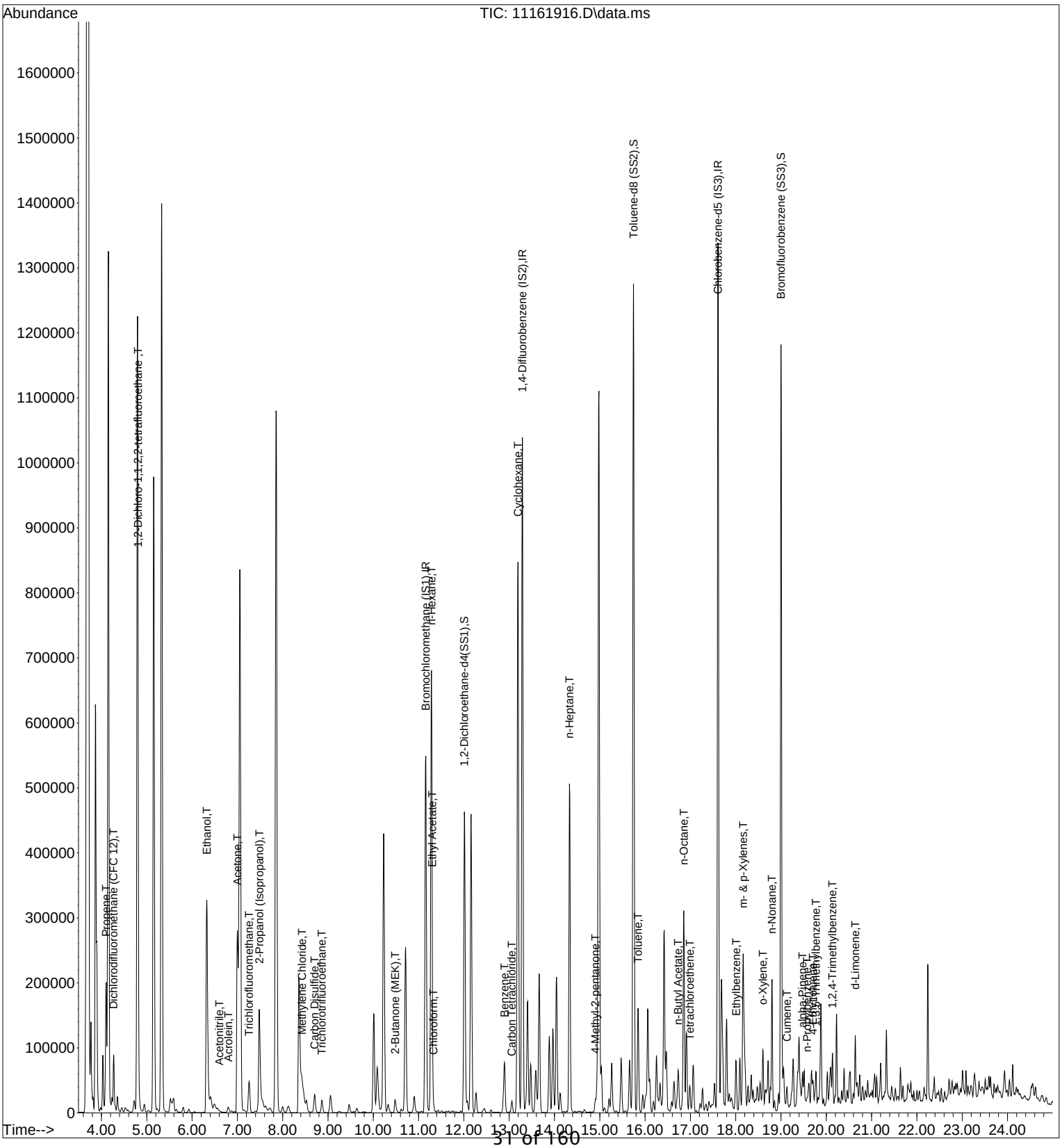
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	243337	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	1002340	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	463998	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	358327	11.506	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.08%				
57) Toluene-d8 (SS2)	15.74	98	1016125	12.515	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.08%				
73) Bromofluorobenzene (SS3)	19.00	174	390948	13.478	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 107.84%				
Target Compounds							Qvalue
2) Propene	4.10	42	66313	1.613	ng		97
3) Dichlorodifluoromethan...	4.27	85	80609	1.596	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1867	0.075	ng		90
10) Ethanol	6.32	45	560169	23.845	ng		100
11) Acetonitrile	6.60	41	3959	0.068	ng		93
12) Acrolein	6.80	56	2181	0.117	ng		100
13) Acetone	7.00	58	177169	8.105	ng	#	68
14) Trichlorofluoromethane	7.26	101	51653	1.196	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	303127	4.856	ng		100
19) Methylene Chloride	8.43	84	1817	0.067	ng		95
21) Trichlorotrifluoroethane	8.86	151	8931	0.403	ng		97
22) Carbon Disulfide	8.71	76	55269	0.577	ng		98
27) 2-Butanone (MEK)	10.48	72	7954	0.457	ng		96
30) Ethyl Acetate	11.30	61	5441	0.592	ng	#	28
31) n-Hexane	11.28	57	373092	8.444	ng		99
32) Chloroform	11.33	83	7458	0.174	ng		98
41) Benzene	12.90	78	71861	0.708	ng		99
42) Carbon Tetrachloride	13.06	117	4403	0.149	ng		96
43) Cyclohexane	13.19	84	372082	9.869	ng		98
51) n-Heptane	14.33	71	135181	5.317	ng		98
53) 4-Methyl-2-pentanone	14.90	58	6959	0.290	ng		98
58) Toluene	15.84	91	136190	1.590	ng		100
62) n-Butyl Acetate	16.73	43	30427	0.473	ng	#	69
63) n-Octane	16.86	57	64902	2.968	ng		99
64) Tetrachloroethene	16.99	166	6714	0.262	ng		97
66) Ethylbenzene	18.01	91	46995	0.451	ng		99
67) m- & p-Xylenes	18.16	91	179132	2.297	ng		97
70) o-Xylene	18.60	91	50046	0.677	ng		100
71) n-Nonane	18.80	43	77234	1.461	ng		98
74) Cumene	19.13	105	7468	0.077	ng		97
75) alpha-Pinene	19.48	93	18973	0.395	ng		95
76) n-Propylbenzene	19.58	91	8903	0.073	ng		82
78) 4-Ethyltoluene	19.70	105	5084	0.059	ng		94
79) 1,3,5-Trimethylbenzene	19.77	105	16895	0.213	ng		99
82) 1,2,4-Trimethylbenzene	20.13	105	23108	0.299	ng		88
91) d-Limonene	20.64	68	23844	0.818	ng		87

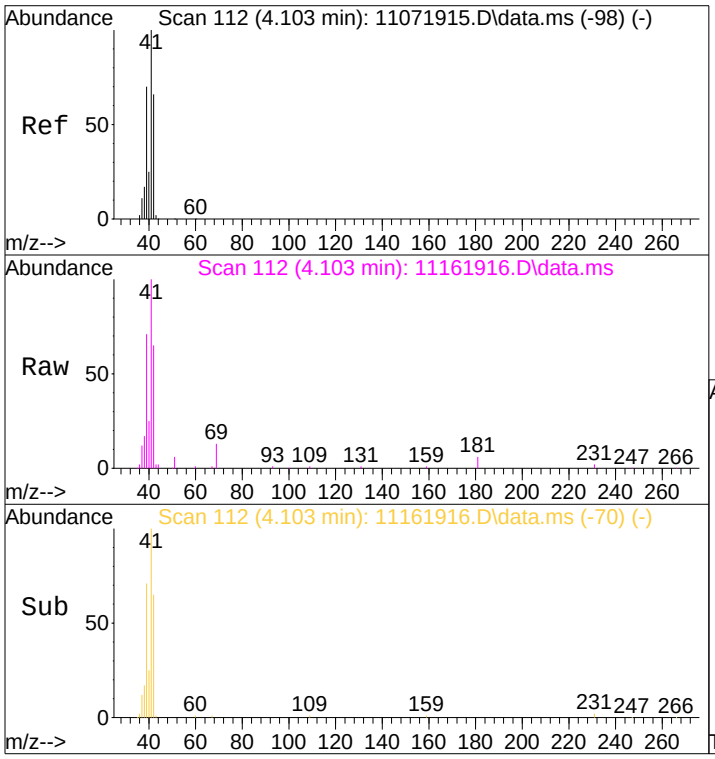
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161916.D
Acq On : 16 Nov 2019 11:57 Operator: WA
Sample : P1906559-001 (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 14:54:51 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

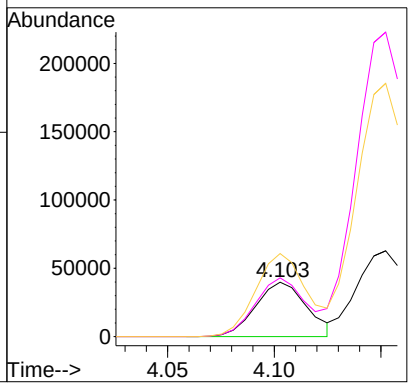


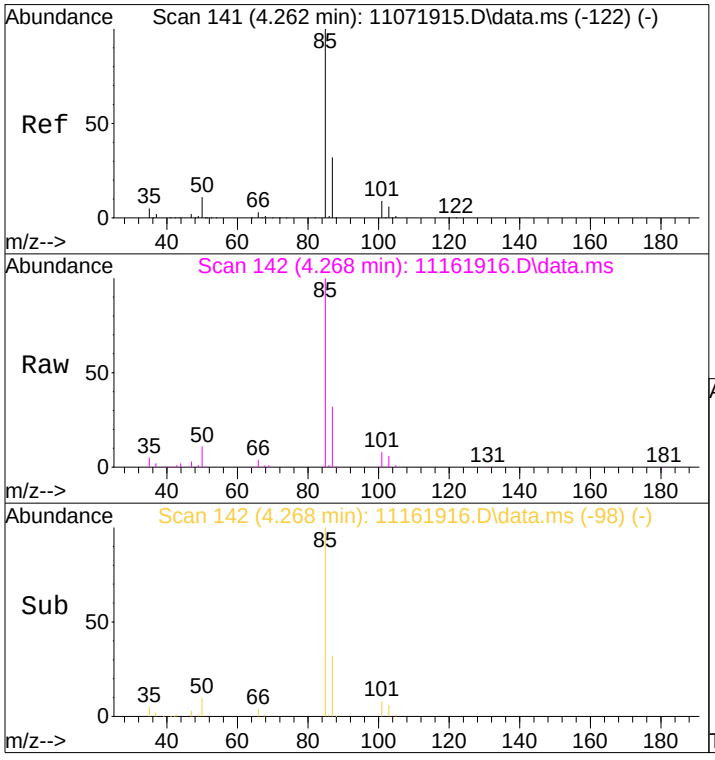


#2
Propene
Concen: 1.61 ng
RT: 4.10 min Scan# 112
Delta R.T. -0.017 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 42 Resp: 66313

Ion	Ratio	Lower	Upper
42	100		
39	103.5	87.0	127.0
41	155.1	132.2	172.2

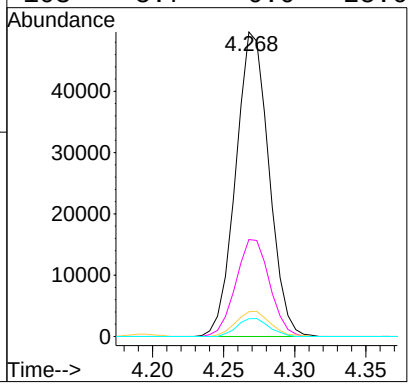


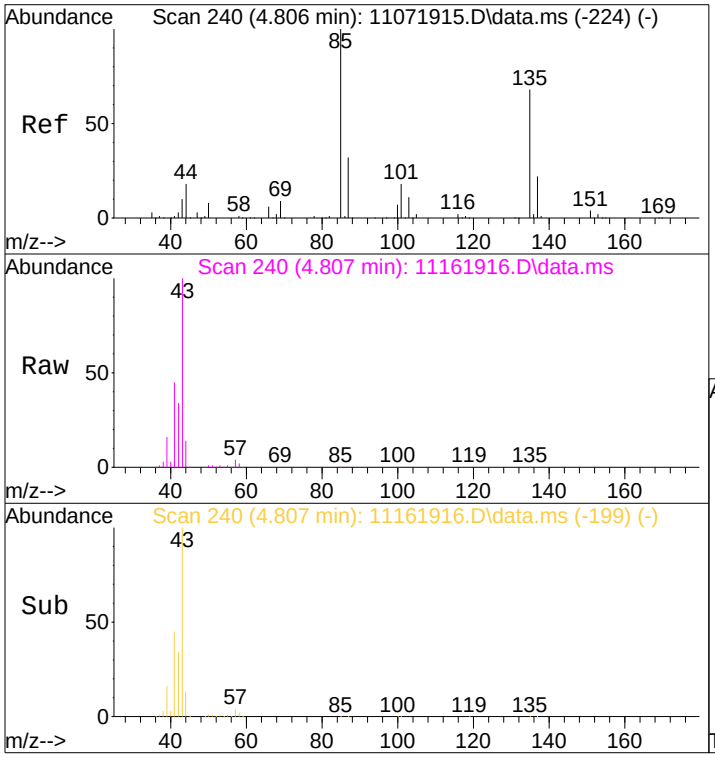


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.60 ng
RT: 4.27 min Scan# 142
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 85 Resp: 80609

Ion	Ratio	Lower	Upper
85	100		
87	32.5	12.3	52.3
101	8.6	0.0	28.6
103	5.7	0.0	25.6

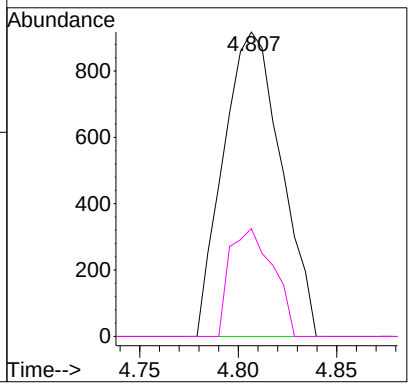


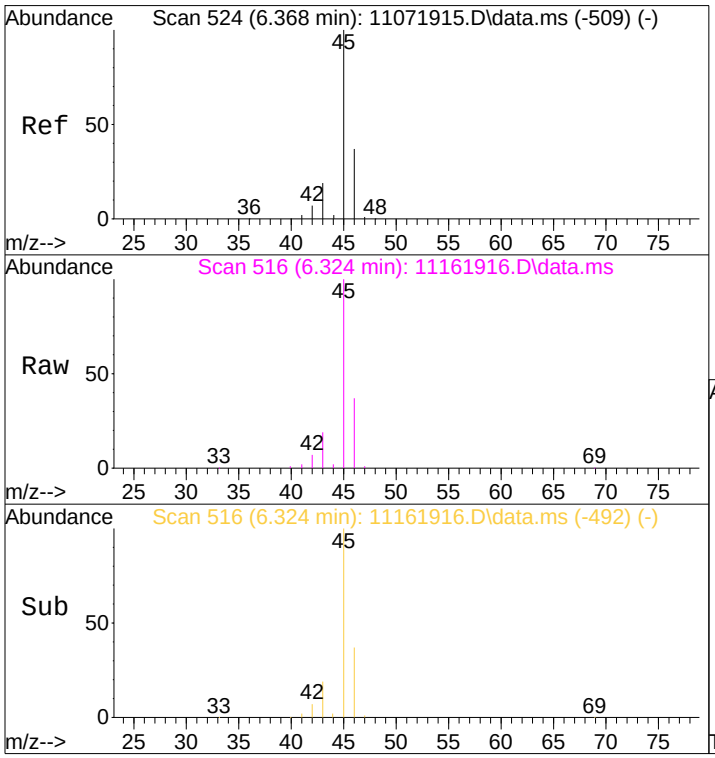


#5
1,2-Dichloro-1,1,2,2-tetrafluoroethane
Concen: 0.07 ng
RT: 4.81 min Scan# 240
Delta R.T. -0.022 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:135 Resp: 1867

Ion	Ratio	Lower	Upper
135	100		
137	26.6	12.0	52.0

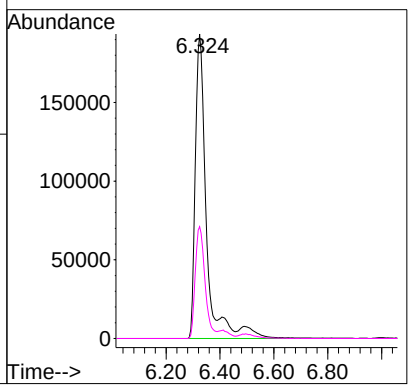


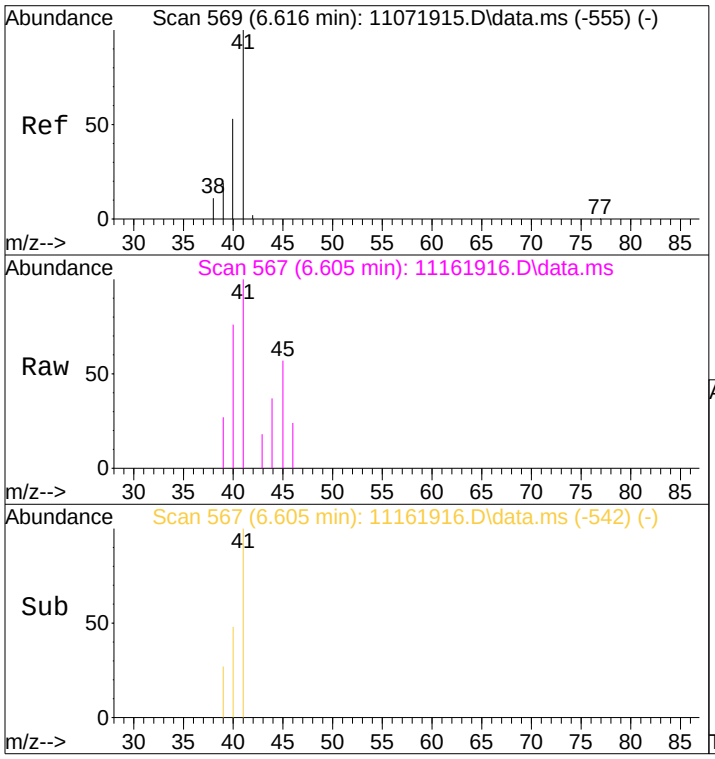


#10
Ethanol
Concen: 23.84 ng
RT: 6.32 min Scan# 516
Delta R.T. -0.115 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 45 Resp: 560169

Ion	Ratio	Lower	Upper
45	100		
46	37.1	17.3	57.3

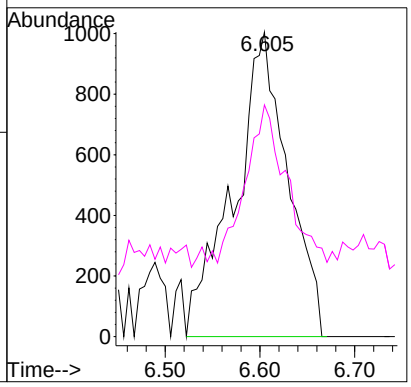


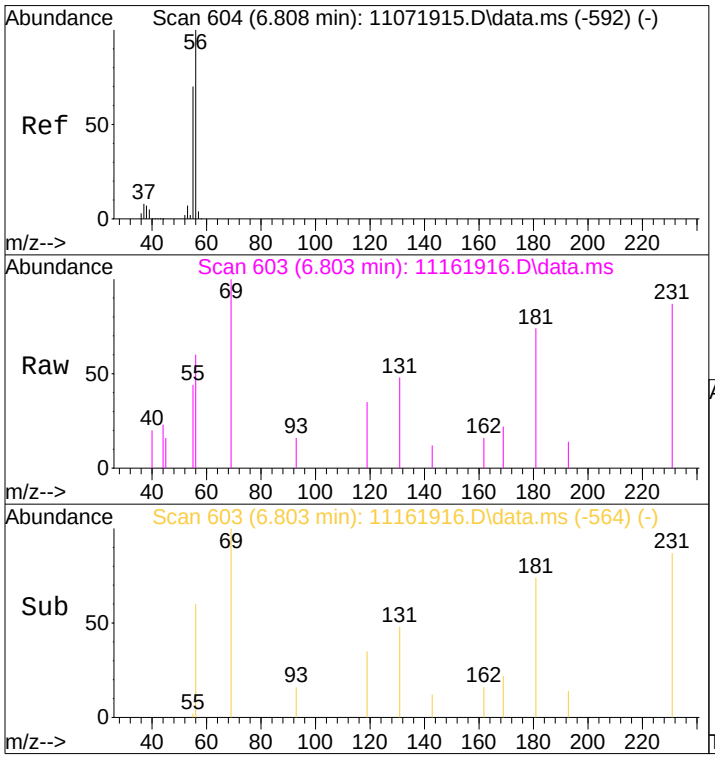


#11
Acetonitrile
Concen: 0.07 ng
RT: 6.60 min Scan# 567
Delta R.T. -0.060 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 41 Resp: 3959

Ion	Ratio	Lower	Upper
41	100		
40	48.0	32.8	72.8

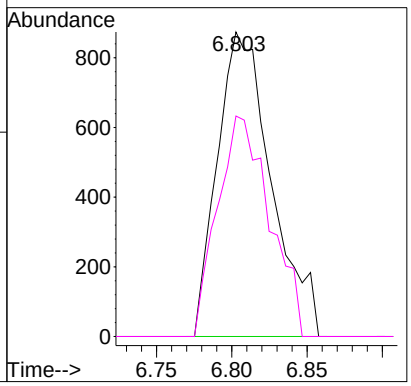


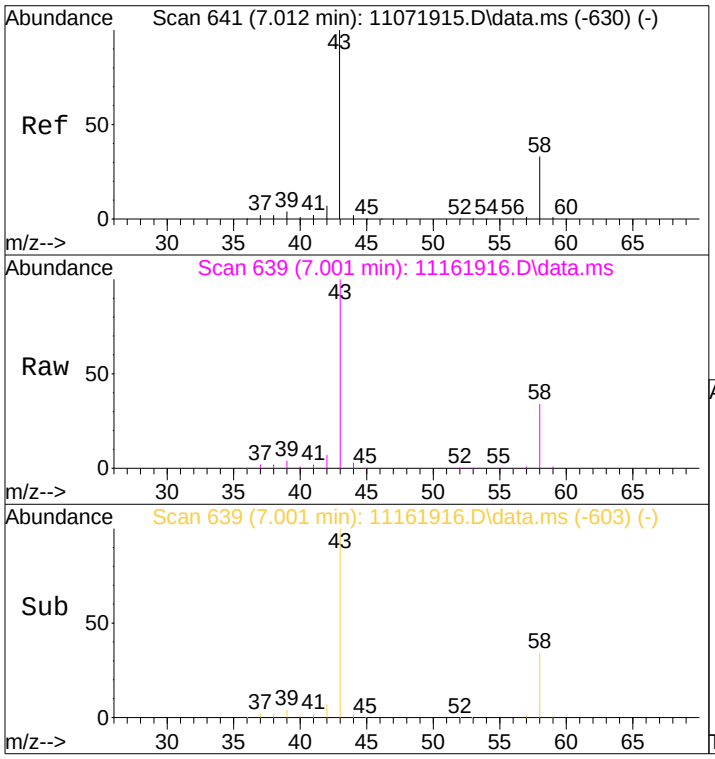


#12
Acrolein
Concen: 0.12 ng
RT: 6.80 min Scan# 603
Delta R.T. -0.033 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 56 Resp: 2181

Ion	Ratio	Lower	Upper
56	100		
55	69.9	49.7	89.7

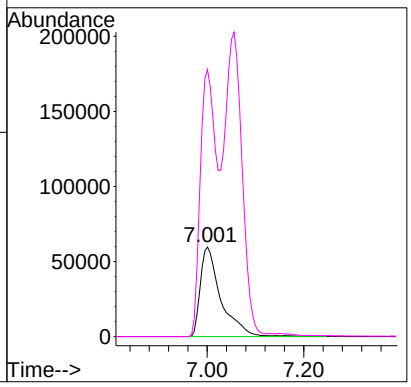


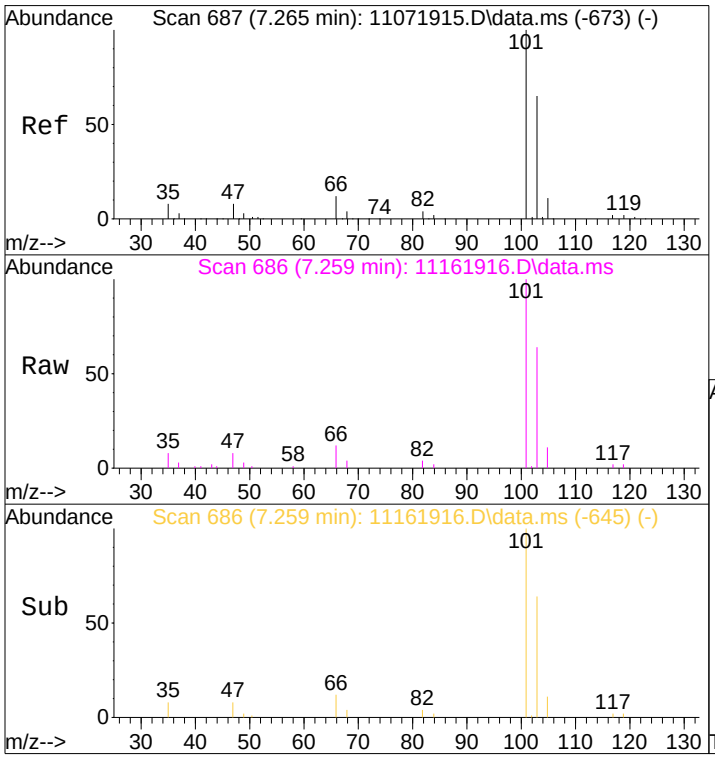


#13
Acetone
Concen: 8.10 ng
RT: 7.00 min Scan# 639
Delta R.T. -0.050 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 58 Resp: 177169

Ion	Ratio	Lower	Upper
58	100		
43	242.9	276.0	336.0#

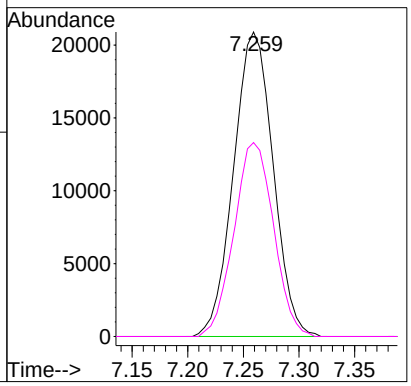


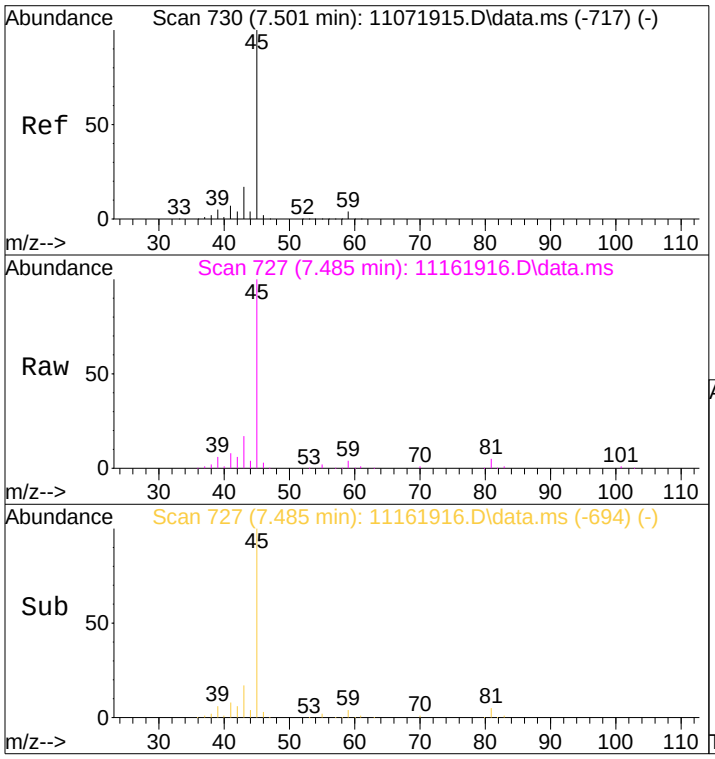


#14
Trichlorofluoromethane
Concen: 1.20 ng
RT: 7.26 min Scan# 686
Delta R.T. -0.022 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:101 Resp: 51653

Ion	Ratio	Lower	Upper
101	100		
103	63.7	44.8	84.8

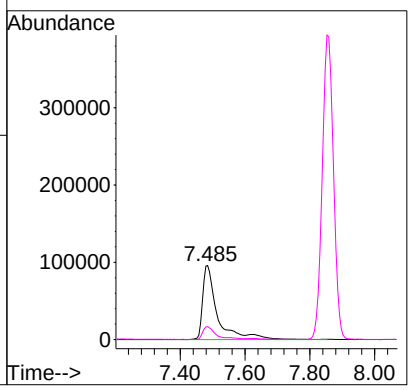


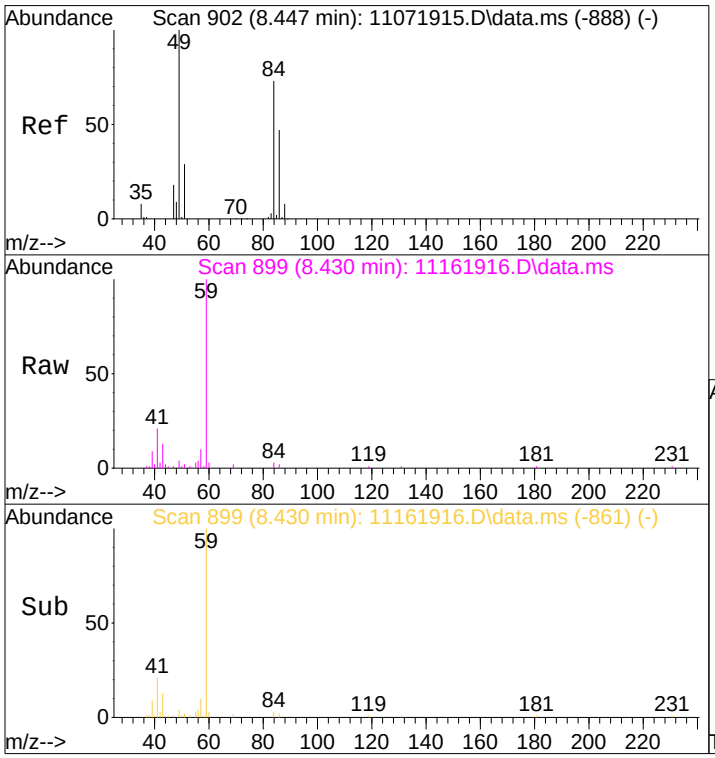


#15
2-Propanol (Isopropanol)
Concen: 4.86 ng
RT: 7.48 min Scan# 727
Delta R.T. -0.066 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 45 Resp: 303127

Ion	Ratio	Lower	Upper
45	100		
43	17.3	0.0	37.3

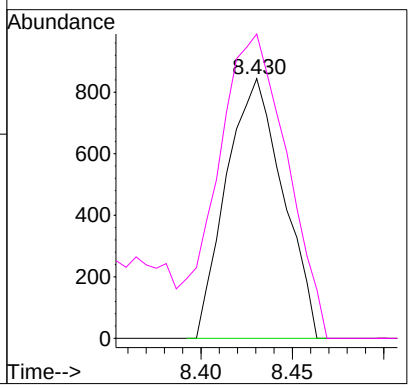


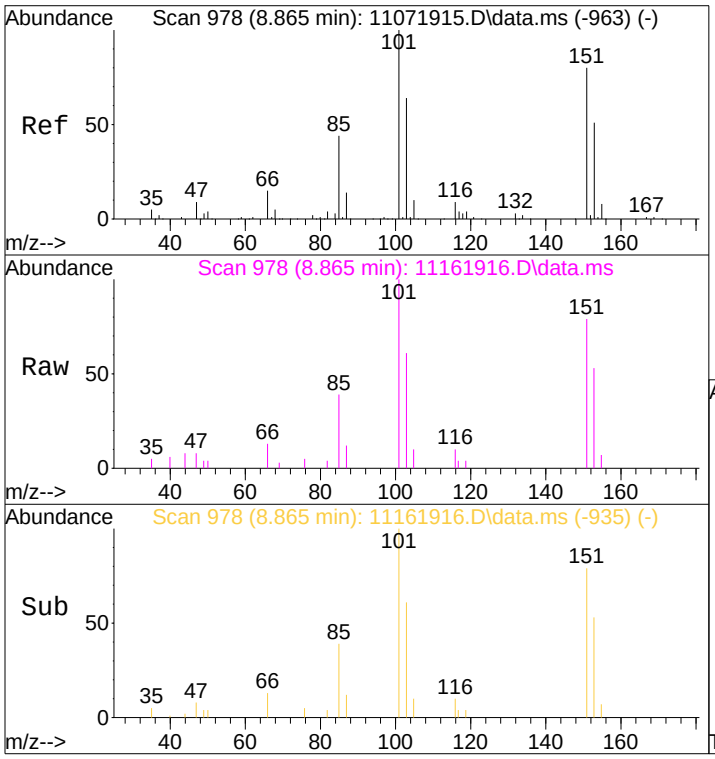


#19
Methylene Chloride
Concen: 0.07 ng
RT: 8.43 min Scan# 899
Delta R.T. -0.039 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 84 Resp: 1817

Ion	Ratio	Lower	Upper
84	100		
49	144.4	113.7	163.7

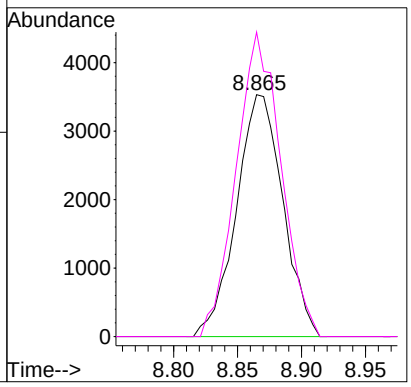


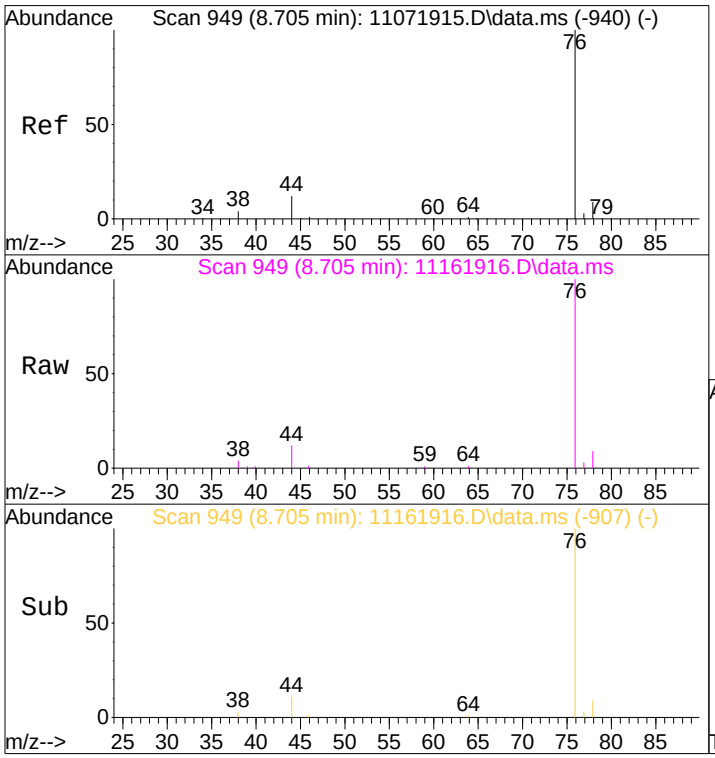


#21
Trichlorotrifluoroethane
Concen: 0.40 ng
RT: 8.86 min Scan# 978
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:151 Resp: 8931

Ion	Ratio	Lower	Upper
151	100		
101	121.3	104.6	144.6

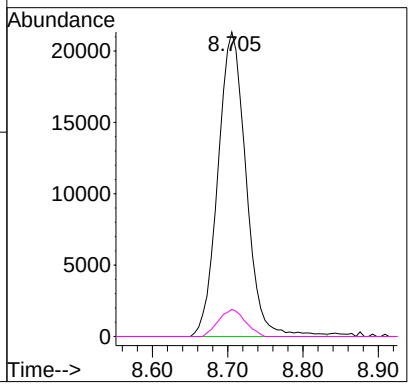


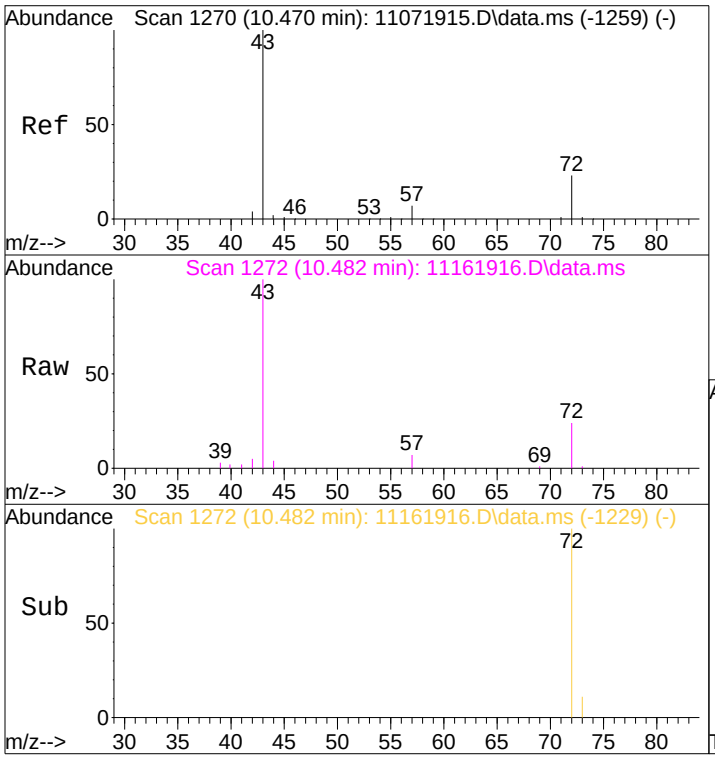


#22
Carbon Disulfide
Concen: 0.58 ng
RT: 8.71 min Scan# 949
Delta R.T. -0.017 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 76 Resp: 55269

Ion	Ratio	Lower	Upper
76	100		
78	8.5	0.0	29.1

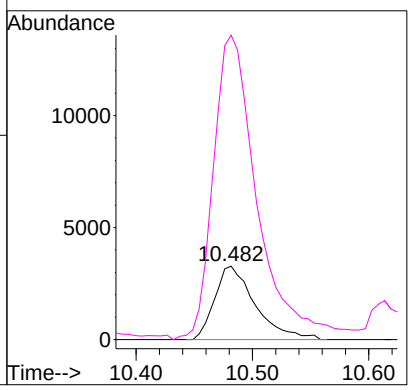


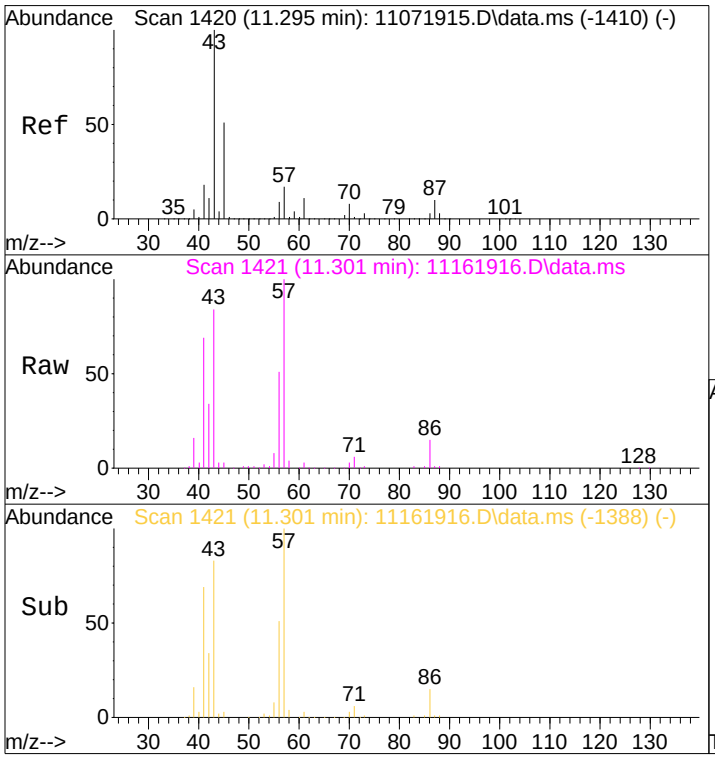


#27
2-Butanone (MEK)
Concen: 0.46 ng
RT: 10.48 min Scan# 1272
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 72 Resp: 7954

Ion	Ratio	Lower	Upper
72	100		
43	450.5	419.6	459.6

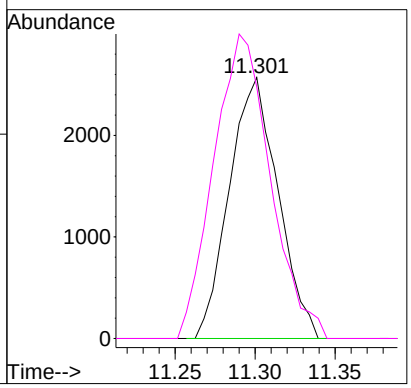


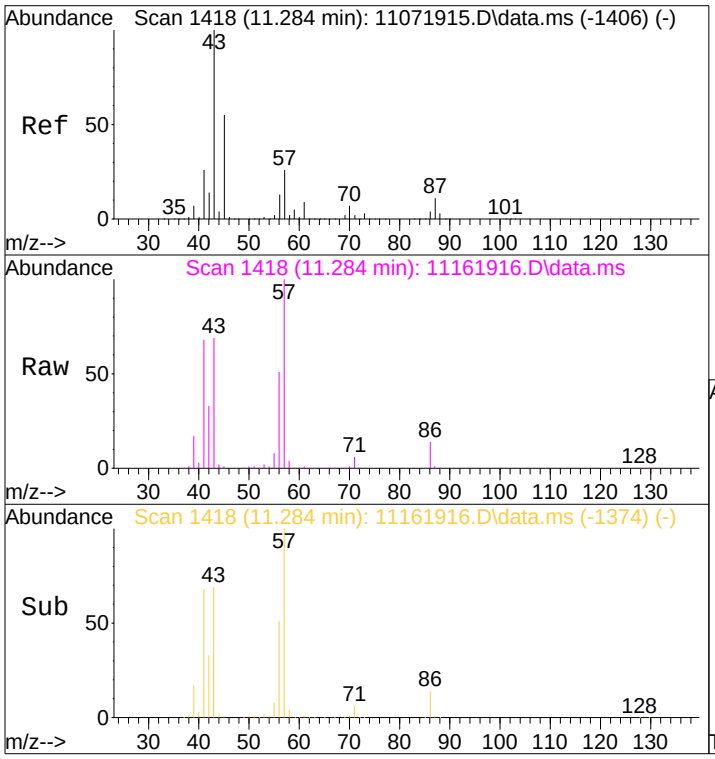


#30
Ethyl Acetate
Concen: 0.59 ng
RT: 11.30 min Scan# 1421
Delta R.T. -0.017 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 61 Resp: 5441

Ion	Ratio	Lower	Upper
61	100		
70	135.7	54.8	94.8#

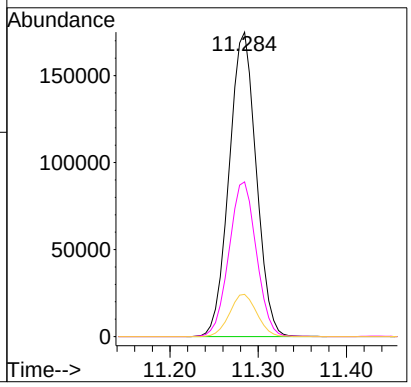


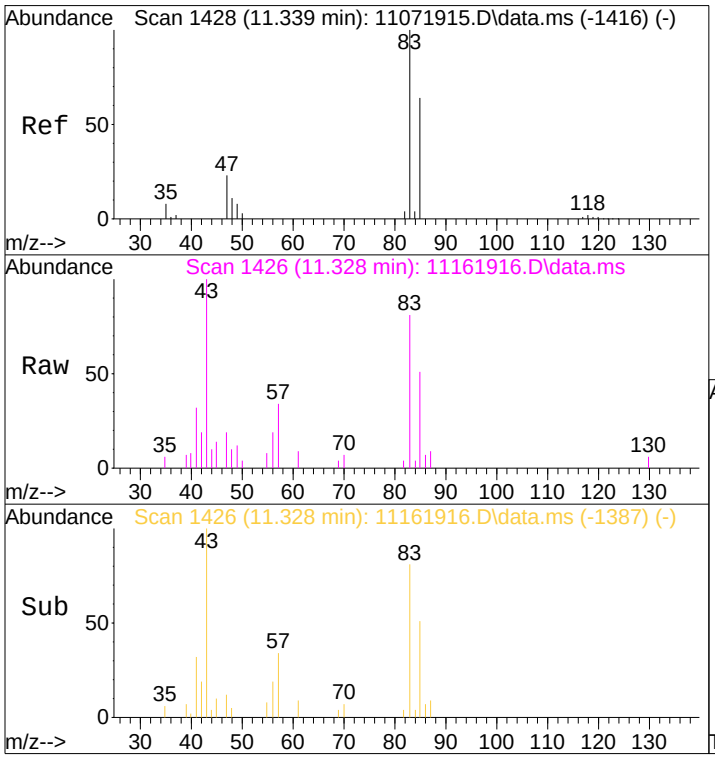


#31
n-Hexane
Concen: 8.44 ng
RT: 11.28 min Scan# 1418
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 57 Resp: 373092

Ion	Ratio	Lower	Upper
57	100		
56	51.4	40.7	61.1
86	14.1	12.0	18.0

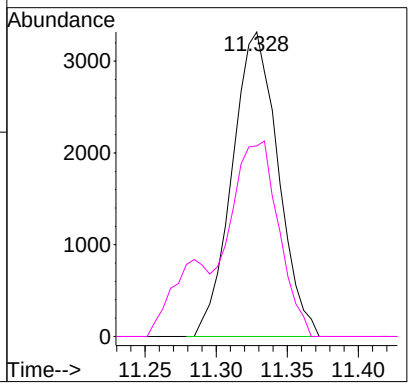


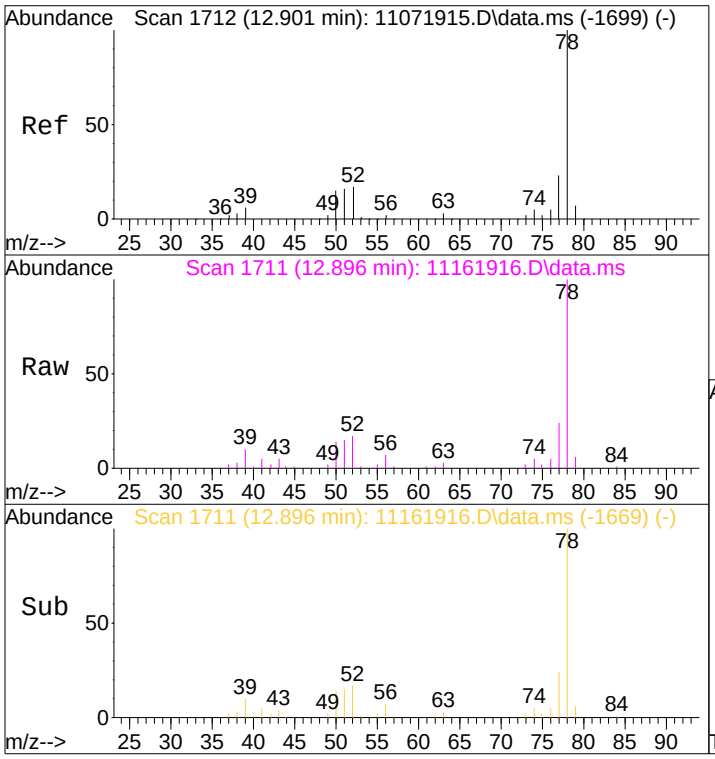


#32
Chloroform
Concen: 0.17 ng
RT: 11.33 min Scan# 1426
Delta R.T. -0.033 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 83 Resp: 7458

Ion	Ratio	Lower	Upper
83	100		
85	67.2	45.3	85.3

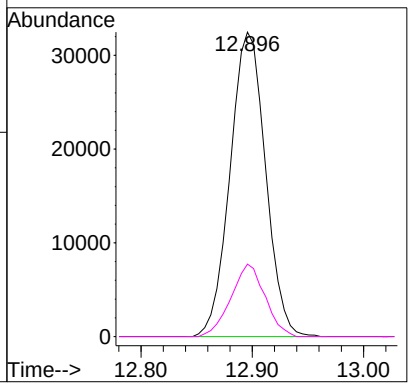


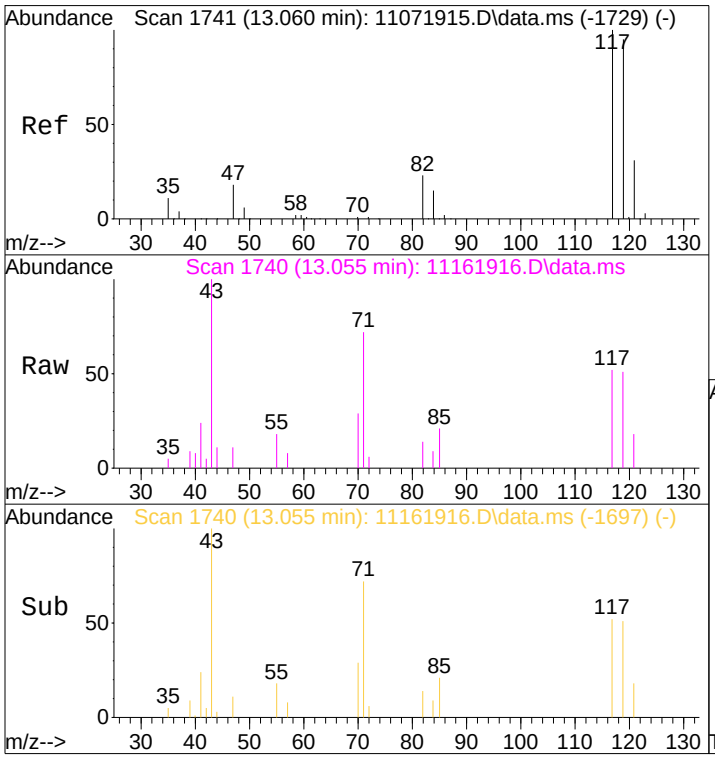


#41
Benzene
Concen: 0.71 ng
RT: 12.90 min Scan# 1711
Delta R.T. -0.017 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 78 Resp: 71861

Ion	Ratio	Lower	Upper
78	100		
77	22.9	3.2	43.2

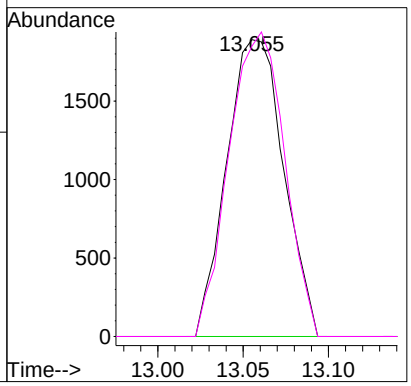


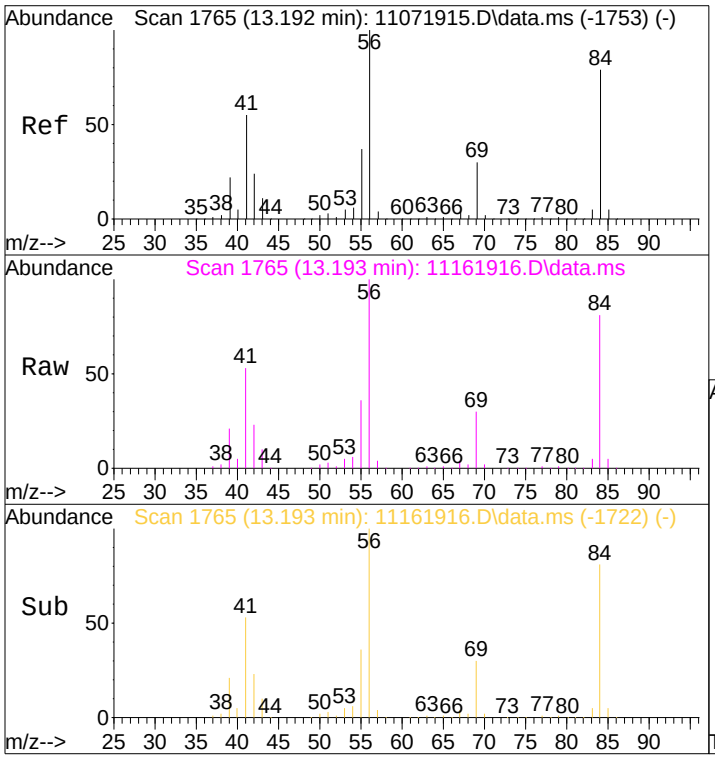


#42
Carbon Tetrachloride
Concen: 0.15 ng
RT: 13.06 min Scan# 1740
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:117 Resp: 4403

Ion	Ratio	Lower	Upper
117	100		
119	100.1	75.8	115.8

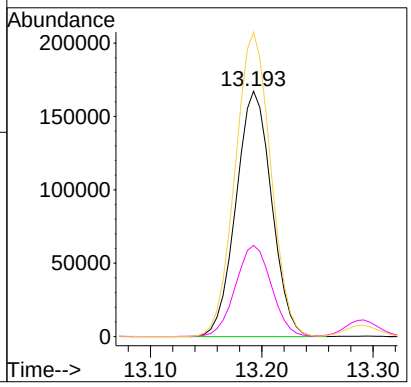


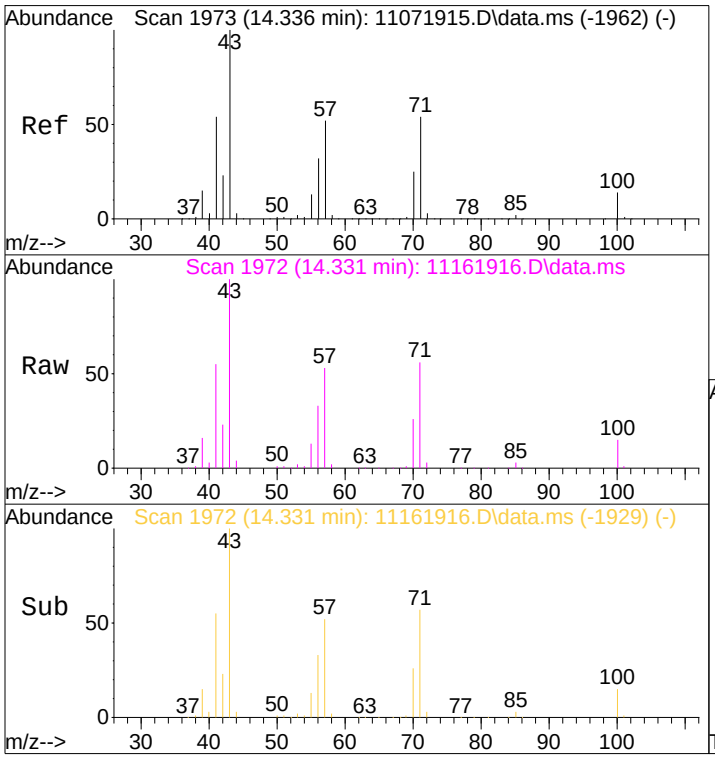


#43
Cyclohexane
Concen: 9.87 ng
RT: 13.19 min Scan# 1765
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 84 Resp: 372082

Ion	Ratio	Lower	Upper
84	100		
69	37.6	17.6	57.6
56	124.1	106.5	146.5

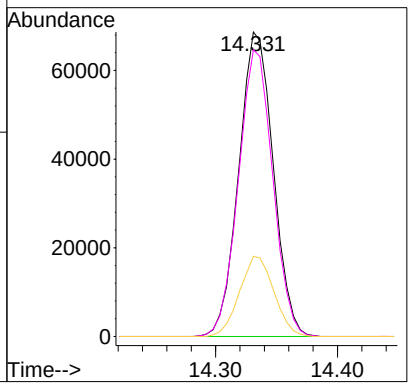


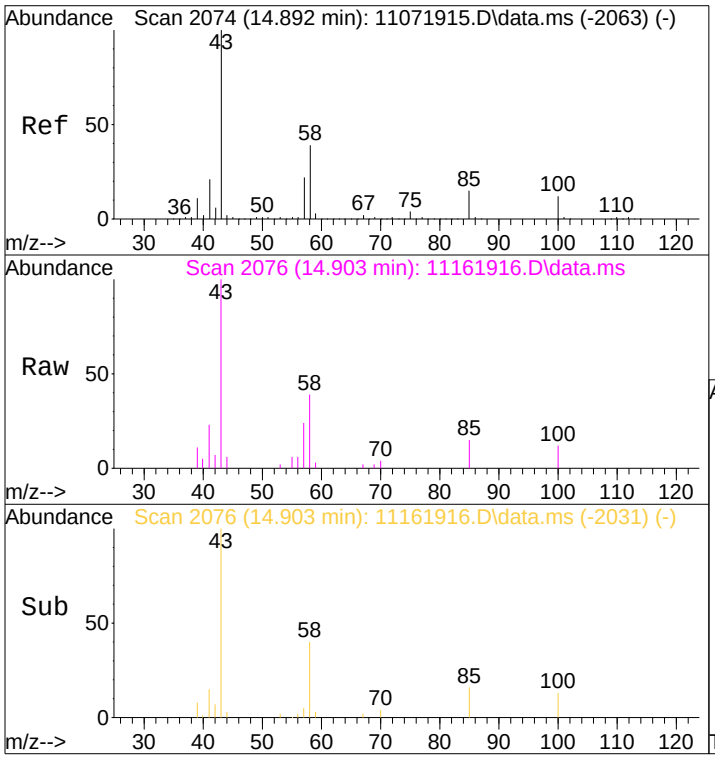


#51
n-Heptane
Concen: 5.32 ng
RT: 14.33 min Scan# 1972
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 71 Resp: 135181

Ion	Ratio	Lower	Upper
71	100		
57	93.7	75.9	115.9
100	26.2	6.0	46.0

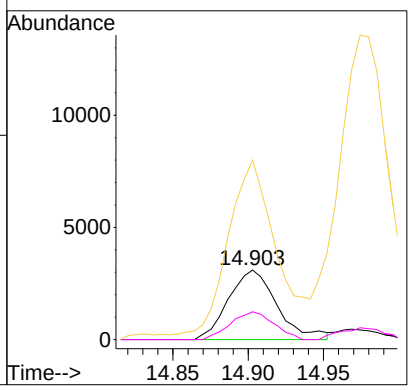


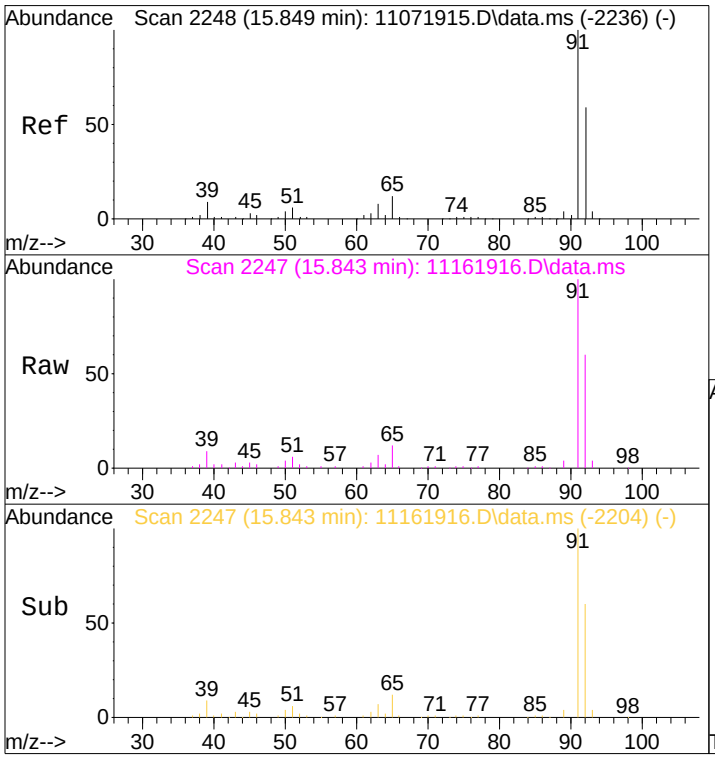


#53
4-Methyl-2-pentanone
Concen: 0.29 ng
RT: 14.90 min Scan# 2076
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 58 Resp: 6959

Ion	Ratio	Lower	Upper
58	100		
85	35.5	32.8	49.2
43	257.9	205.2	307.8

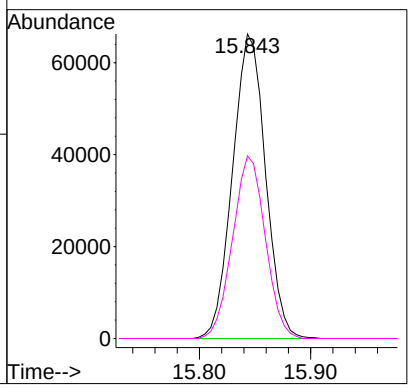


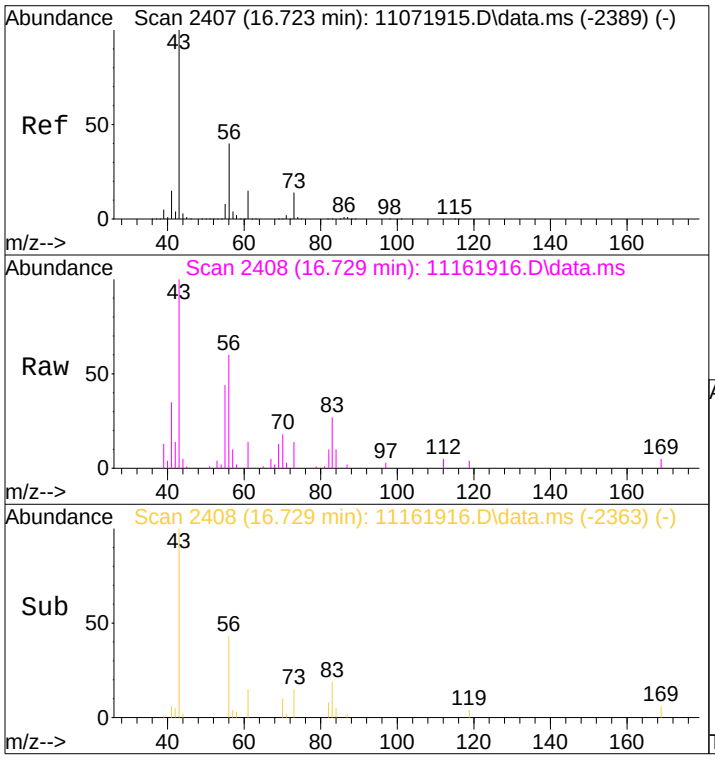


#58
Toluene
Concen: 1.59 ng
RT: 15.84 min Scan# 2247
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 91 Resp: 136190

Ion	Ratio	Lower	Upper
91	100		
92	59.4	39.4	79.4

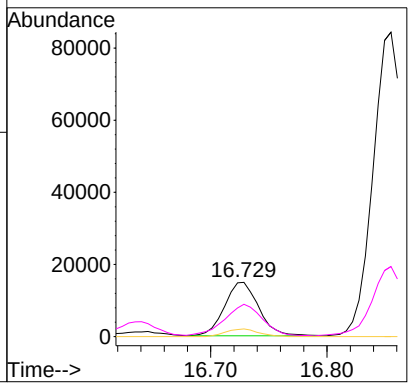


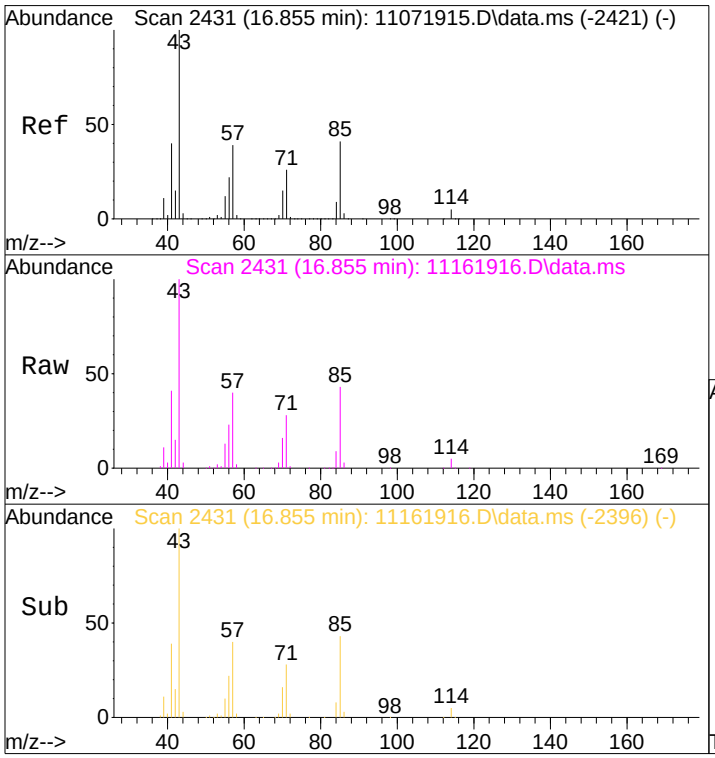


#62
n-Butyl Acetate
Concen: 0.47 ng
RT: 16.73 min Scan# 2408
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 43 Resp: 30427

Ion	Ratio	Lower	Upper
43	100		
56	64.8	19.6	59.6#
73	13.7	0.0	33.6

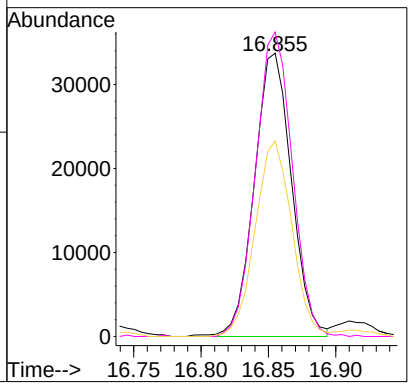


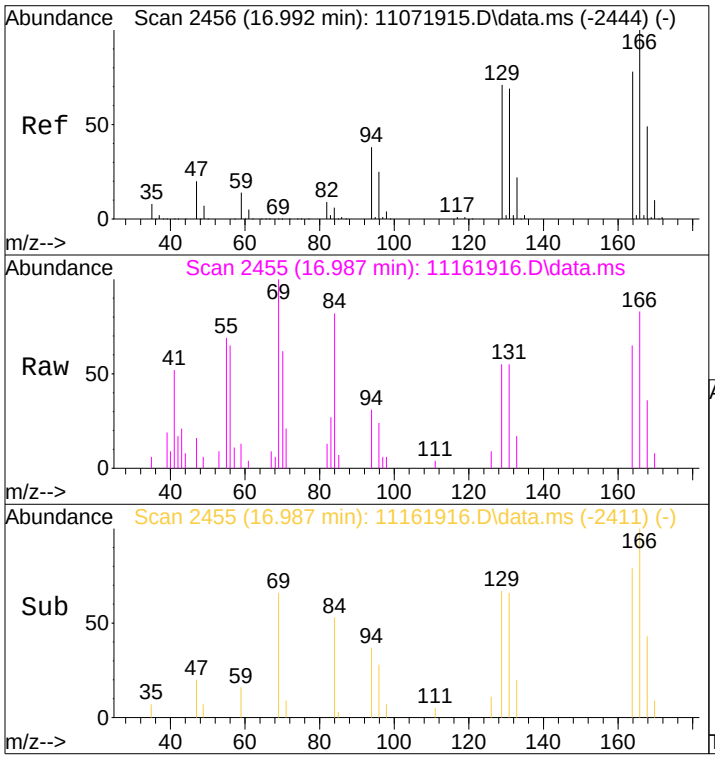


#63
n-Octane
Concen: 2.97 ng
RT: 16.86 min Scan# 2431
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 57 Resp: 64902

Ion	Ratio	Lower	Upper
57	100		
85	105.7	83.7	125.5
71	68.1	53.8	80.8

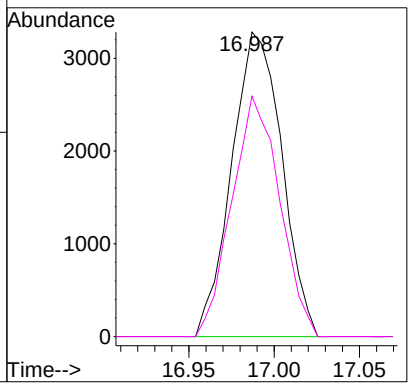


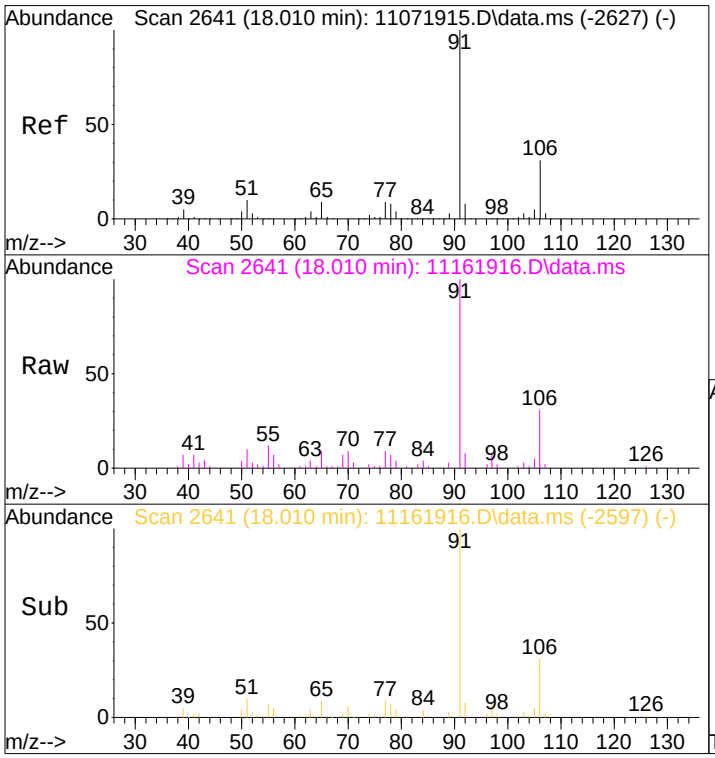


#64
Tetrachloroethene
Concen: 0.26 ng
RT: 16.99 min Scan# 2455
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:166 Resp: 6714

Ion	Ratio	Lower	Upper
166	100		
164	75.4	58.3	98.3

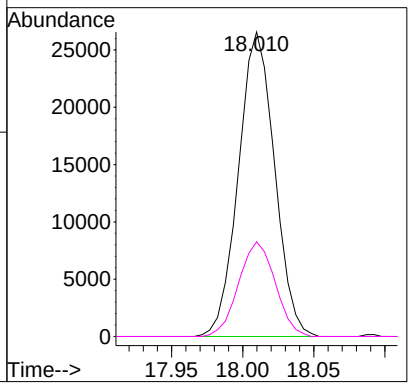


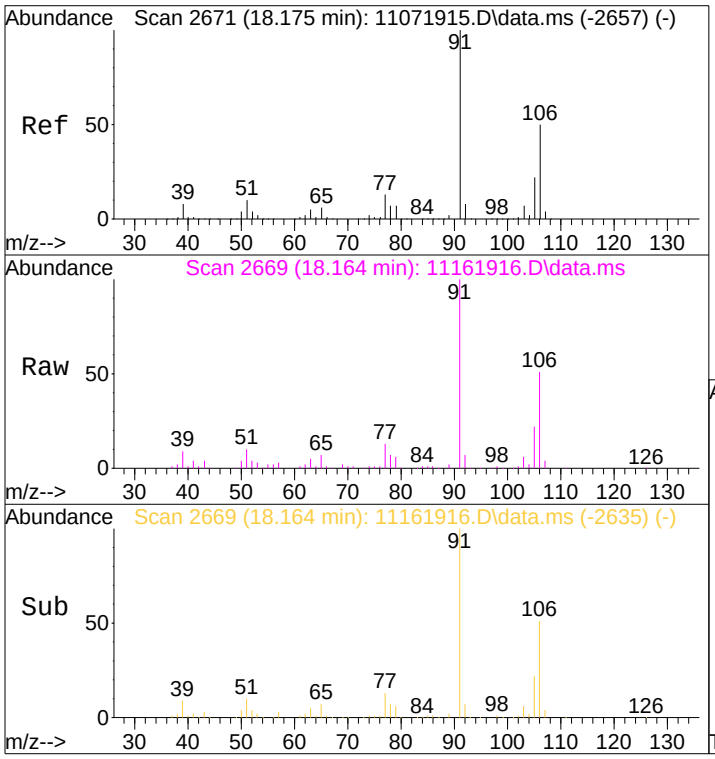


#66
Ethylbenzene
Concen: 0.45 ng
RT: 18.01 min Scan# 2641
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 91 Resp: 46995

Ion	Ratio	Lower	Upper
91	100		
106	31.5	11.2	51.2

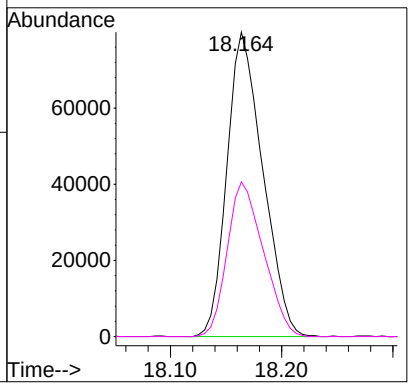


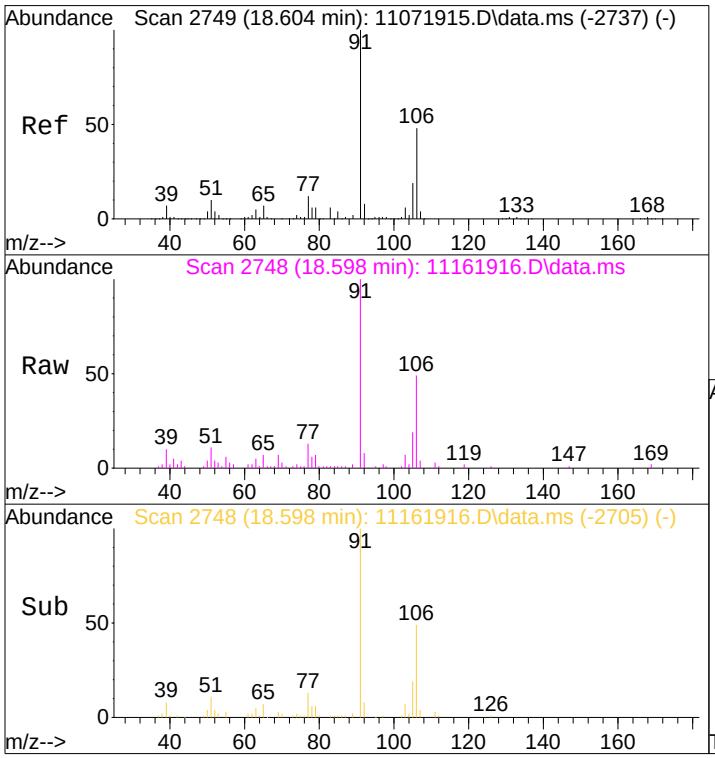


#67
m- & p-Xylenes
Concen: 2.30 ng
RT: 18.16 min Scan# 2669
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 91 Resp: 179132

Ion	Ratio	Lower	Upper
91	100		
106	51.2	29.0	69.0

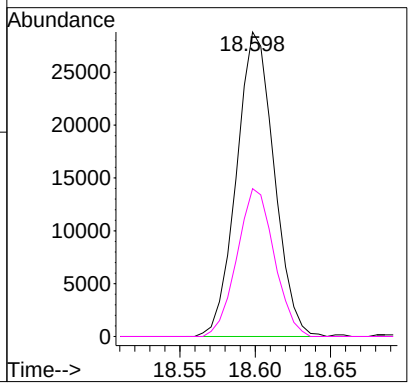


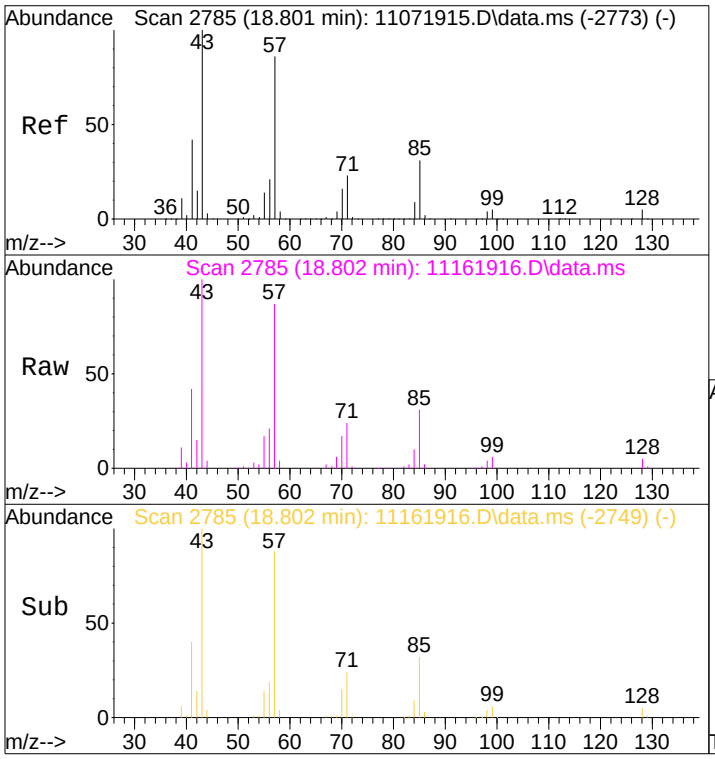


#70
o-Xylene
Concen: 0.68 ng
RT: 18.60 min Scan# 2748
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 91 Resp: 50046

Ion	Ratio	Lower	Upper
91	100		
106	48.0	28.0	68.0

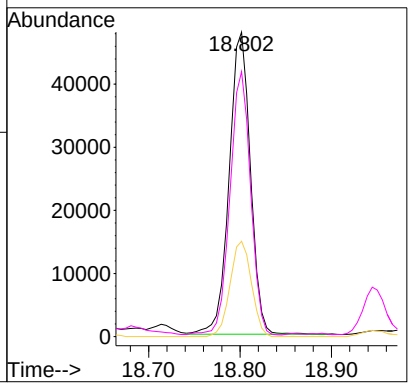


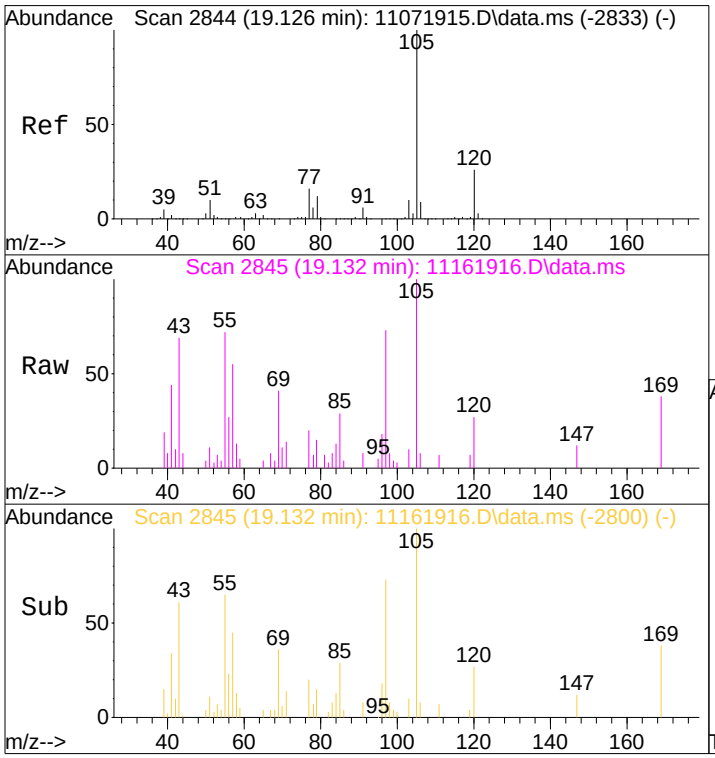


#71
n-Nonane
Concen: 1.46 ng
RT: 18.80 min Scan# 2785
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 43 Resp: 77234

Ion	Ratio	Lower	Upper
43	100		
57	84.4	65.8	105.8
85	31.6	10.4	50.4

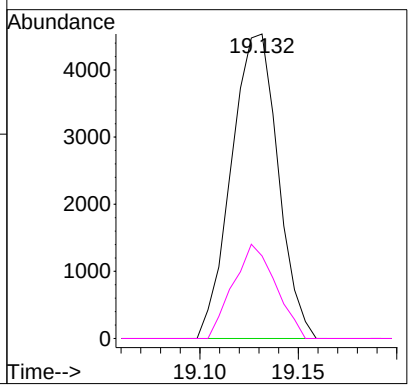


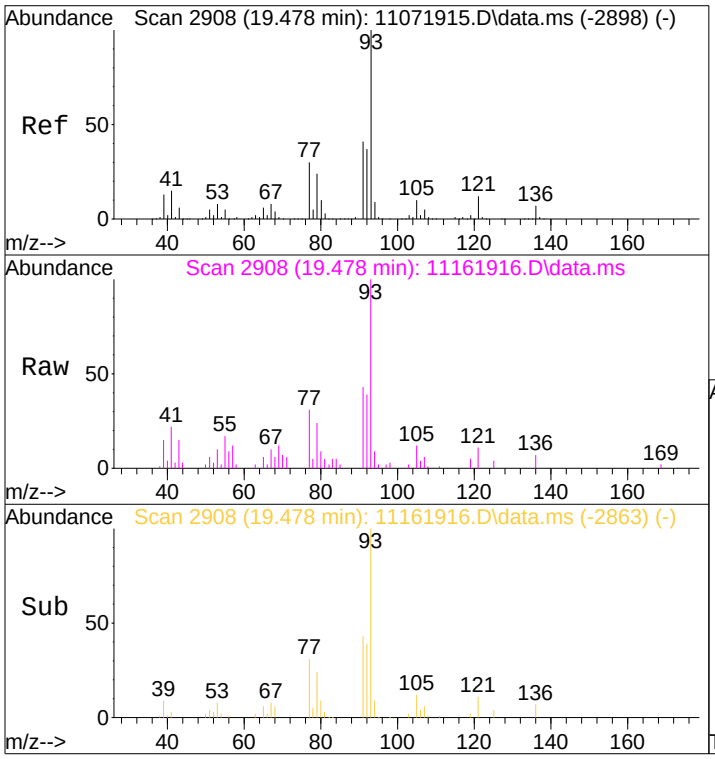


#74
Cumene
Concen: 0.08 ng
RT: 19.13 min Scan# 2845
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:105 Resp: 7468

Ion	Ratio	Lower	Upper
105	100		
120	28.2	6.6	46.6

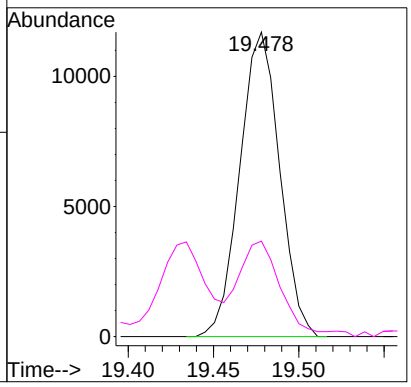


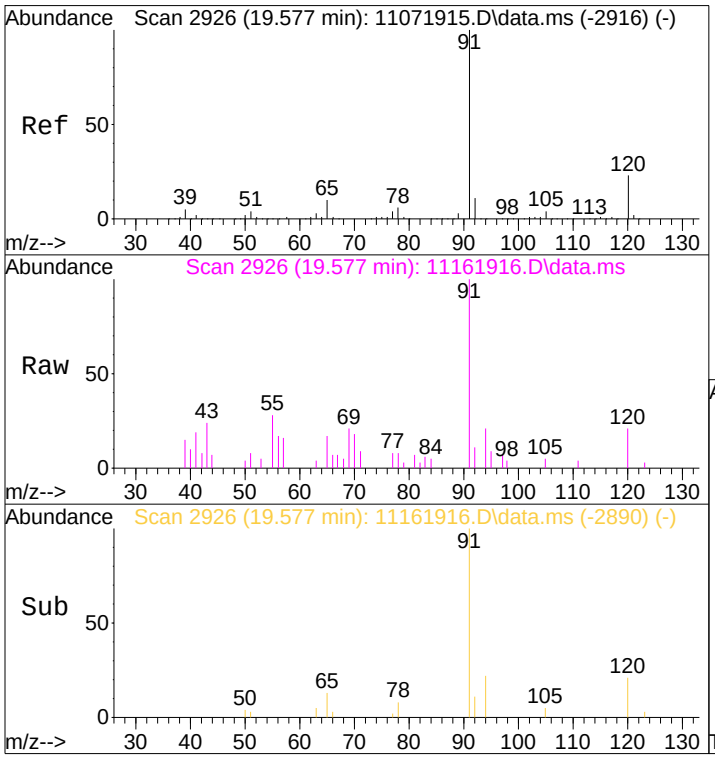


#75
alpha-Pinene
Concen: 0.40 ng
RT: 19.48 min Scan# 2908
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 93 Resp: 18973

Ion	Ratio	Lower	Upper
93	100		
77	33.5	10.7	50.7

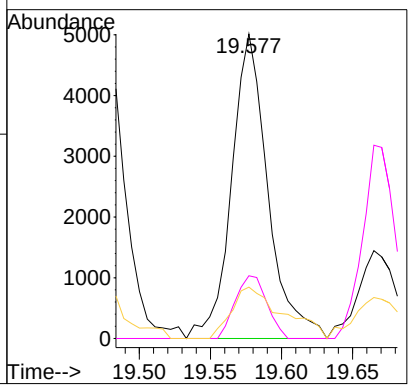


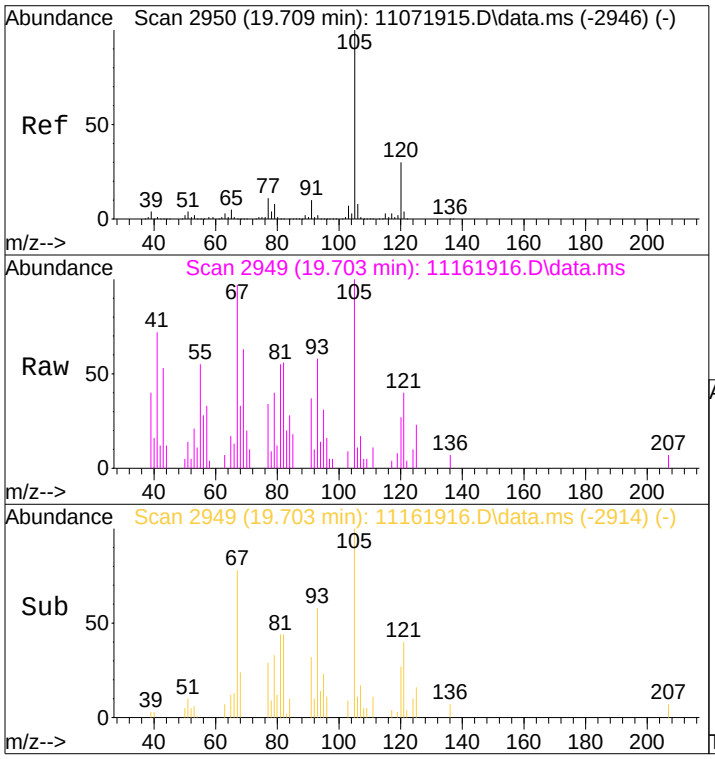


#76
n-Propylbenzene
Concen: 0.07 ng
RT: 19.58 min Scan# 2926
Delta R.T. -0.000 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 91 Resp: 8903

Ion	Ratio	Lower	Upper
91	100		
120	18.0	3.0	43.0
65	23.6	0.0	30.0

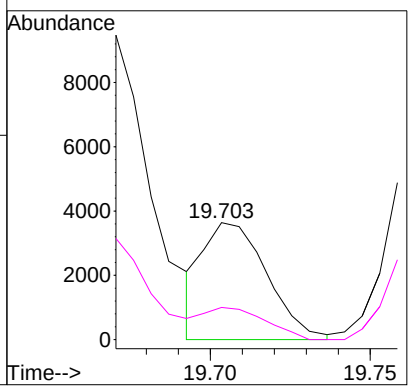


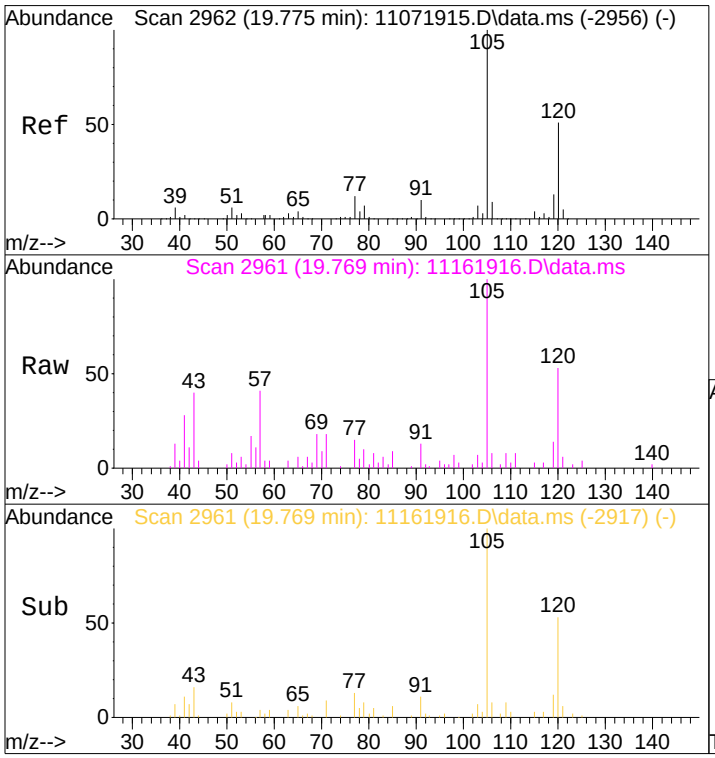


#78
4-Ethyltoluene
Concen: 0.06 ng
RT: 19.70 min Scan# 2949
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:105 Resp: 5084

Ion	Ratio	Lower	Upper
105	100		
120	27.0	10.5	50.5

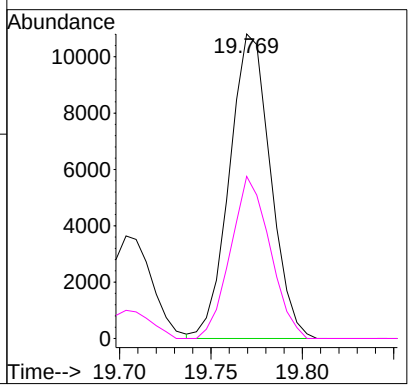


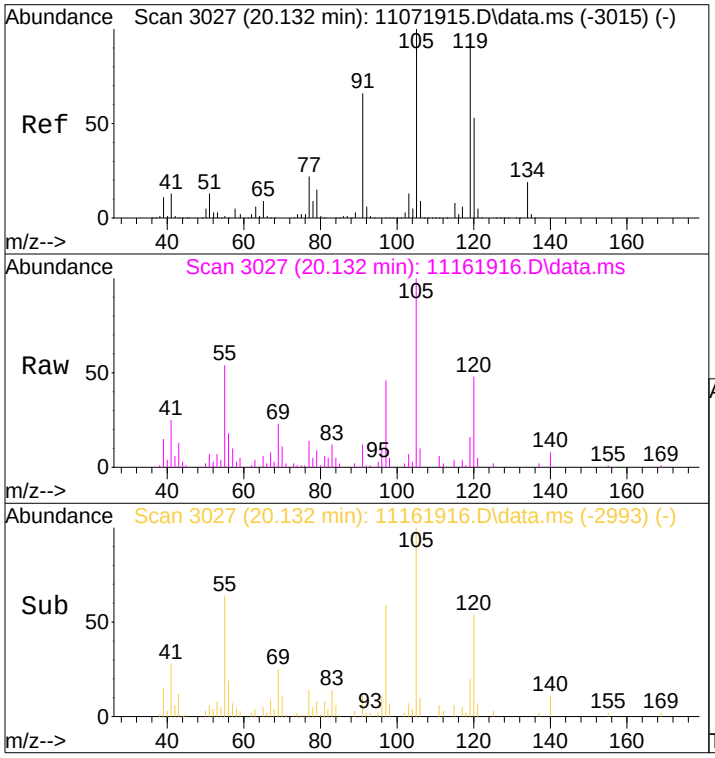


#79
1,3,5-Trimethylbenzene
Concen: 0.21 ng
RT: 19.77 min Scan# 2961
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:105 Resp: 16895

Ion	Ratio	Lower	Upper
105	100		
120	51.1	30.5	70.5

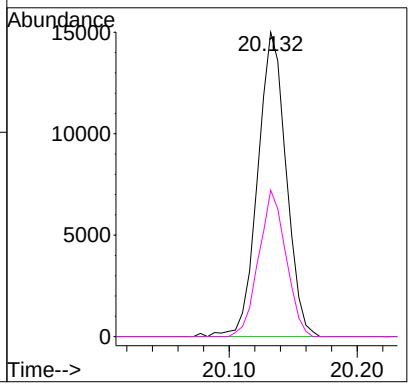


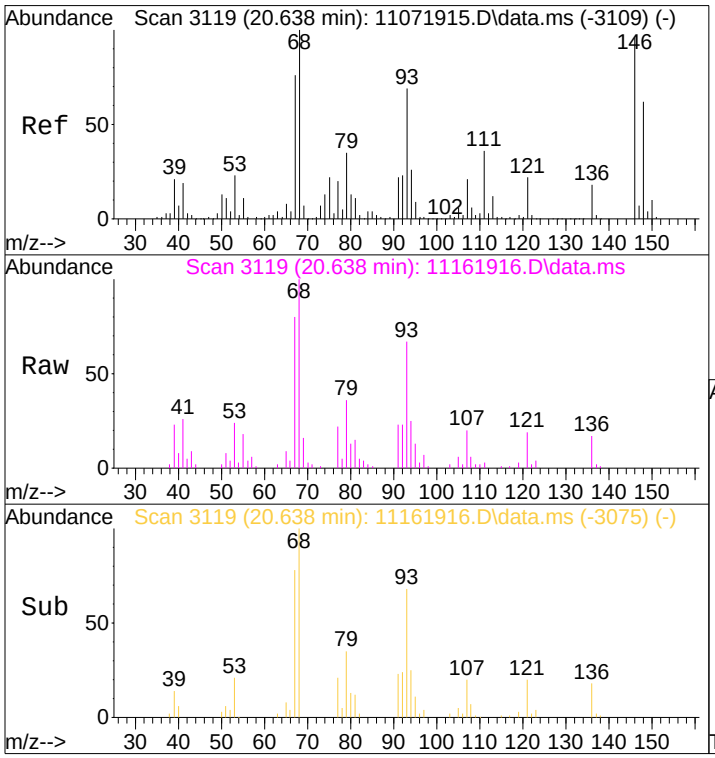


#82
1,2,4-Trimethylbenzene
Concen: 0.30 ng
RT: 20.13 min Scan# 3027
Delta R.T. -0.011 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion:105 Resp: 23108

Ion	Ratio	Lower	Upper
105	100		
120	46.0	34.3	74.3

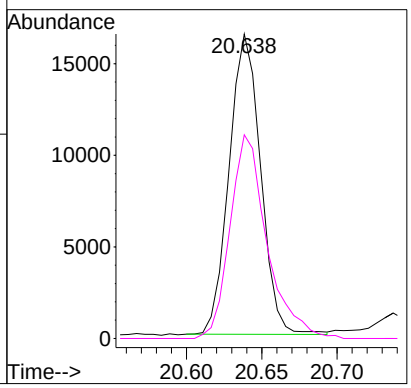




#91
d-Limonene
Concen: 0.82 ng
RT: 20.64 min Scan# 3119
Delta R.T. -0.006 min
Lab File: 11161916.D
Acq: 16 Nov 2019 11:57

Tgt Ion: 68 Resp: 23844

Ion	Ratio	Lower	Upper
68	100		
93	79.7	49.1	89.1



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161918.D
Acq On : 16 Nov 2019 13:04 Operator: WA
Sample : P1906559-002 (1000mL)
Misc : S31-10161904
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 20 15:03:24 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	240757	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	991941	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	460383	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	353962	11.488	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 91.92%				
57) Toluene-d8 (SS2)	15.74	98	1004523	12.469	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.76%				
73) Bromofluorobenzene (SS3)	19.00	174	393021	13.656	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.28%				
Target Compounds							Qvalue
2) Propene	4.10	42	70640	1.736	ng		97
3) Dichlorodifluoromethan...	4.27	85	83470	1.670	ng		100
4) Chloromethane	4.54	50	100	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1968	0.079	ng		92
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	5.22	54	740	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.32	45	596138	25.648	ng		99
11) Acetonitrile	0.00	41	0	N.D.	d		
12) Acrolein	6.80	56	2775	0.151	ng		96
13) Acetone	7.00	58	188513	8.716	ng	#	66
14) Trichlorofluoromethane	7.26	101	53147	1.244	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	324175	5.248	ng		99
16) Acrylonitrile	0.00	53	0	N.D.	d		
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d		
19) Methylene Chloride	8.42	84	965	N.D.			
20) 3-Chloro-1-propene (Al...	8.66	41	107	N.D.			
21) Trichlorotrifluoroethane	8.86	151	9221	0.420	ng		99
22) Carbon Disulfide	8.71	76	57028	0.602	ng		99
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	10.01	63	907	N.D.			
25) Methyl tert-Butyl Ether	10.11	73	937	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D.	d		
27) 2-Butanone (MEK)	10.48	72	6668	0.387	ng	#	92
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.	d		
30) Ethyl Acetate	11.30	61	6303	0.693	ng	#	41
31) n-Hexane	11.28	57	389915	8.919	ng		99
32) Chloroform	11.32	83	7925	0.187	ng		100
34) Tetrahydrofuran (THF)	11.78	72	109	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.16	62	992	N.D.			
38) 1,1,1-Trichloroethane	12.42	97	126	N.D.			
39) Isopropyl Acetate	12.90	61	236	N.D.			
40) 1-Butanol	0.00	56	0	N.D.	d		
41) Benzene	12.90	78	78336	0.780	ng		100
42) Carbon Tetrachloride	13.06	117	4878	0.167	ng		99
43) Cyclohexane	13.19	84	385005	10.319	ng		99
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	13.89	63	181	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.	d		
47) Trichloroethene	13.99	130	254	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d		

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Acq On : 16 Nov 2019 13:04 Operator: WA
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Misc : S31-10161904
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 20 15:03:24 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	14.22	100	272	N.D.		
51) n-Heptane	14.33	71	141723	5.632 ng		98
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.90	58	3856	0.162 ng	#	94
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D. d		
58) Toluene	15.84	91	159731	1.880 ng		100
59) 2-Hexanone	0.00	43	0	N.D. d		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D. d		
63) n-Octane	16.85	57	67866	3.128 ng		98
64) Tetrachloroethene	16.99	166	7429	0.293 ng		100
65) Chlorobenzene	0.00	112	0	N.D. d		
66) Ethylbenzene	18.01	91	29523	0.286 ng		99
67) m- & p-Xylenes	18.16	91	117205	1.515 ng		98
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.50	104	843	N.D.		
70) o-Xylene	18.60	91	43532	0.594 ng		99
71) n-Nonane	18.80	43	82482	1.572 ng		98
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D. d		
74) Cumene	19.13	105	8986	0.093 ng		98
75) alpha-Pinene	19.48	93	19328	0.406 ng		93
76) n-Propylbenzene	19.58	91	12103	0.100 ng		84
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	19.70	105	7241	0.084 ng		98
79) 1,3,5-Trimethylbenzene	19.77	105	21660	0.275 ng		100
80) alpha-Methylstyrene	19.91	118	1074	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	20.13	105	38022	0.495 ng		90
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	20.25	91	1209	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	362	N.D.		
86) 1,4-Dichlorobenzene	20.32	146	362	N.D.		
87) sec-Butylbenzene	20.37	105	4298	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D. d		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D. d		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.64	68	24261	0.839 ng		87
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.24	128	6052	0.064 ng		91
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	20.09	119	1854	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D. d		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

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ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 20 15:03:24 2019
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Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
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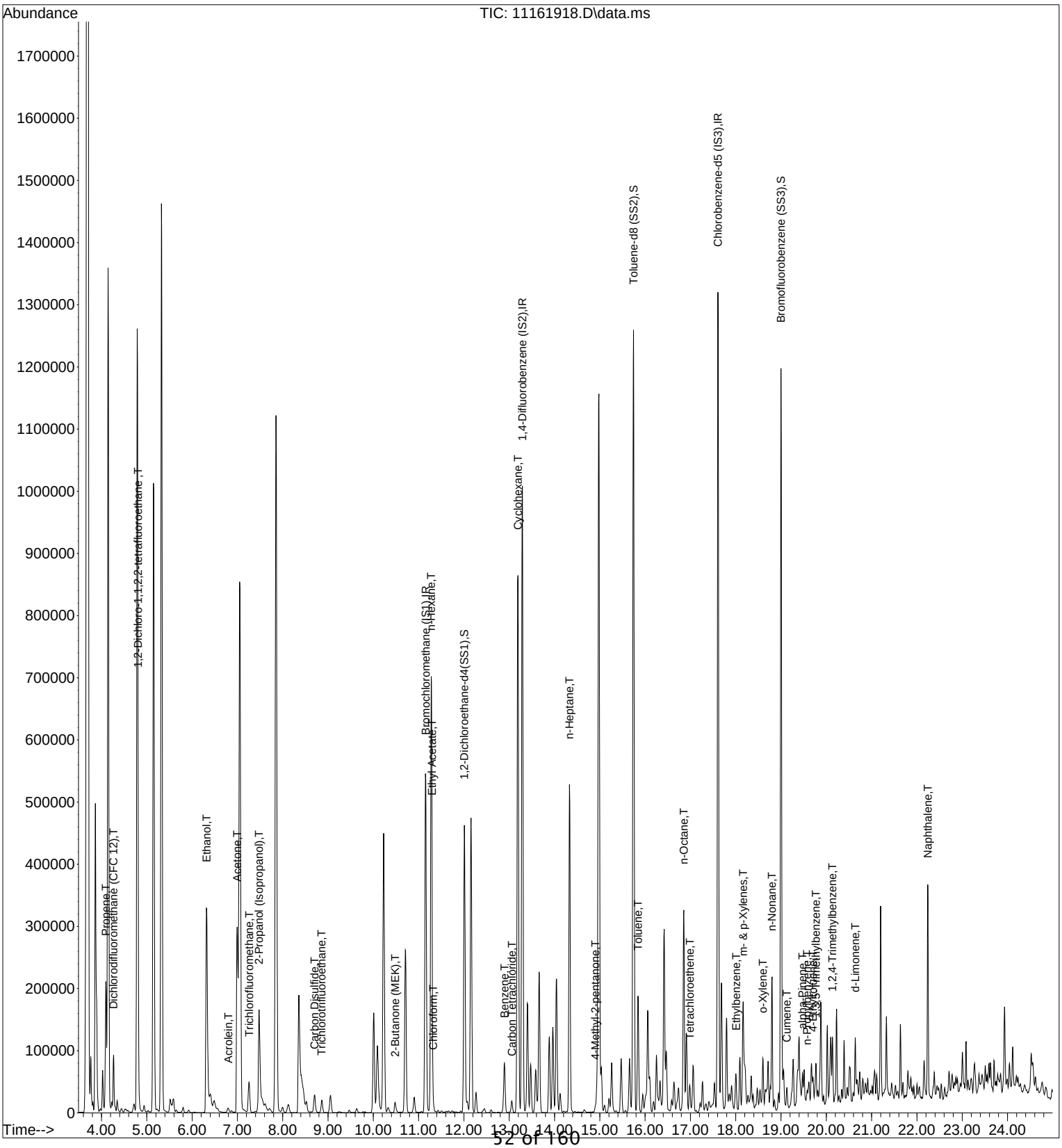
DataAcq Meth:TO15.M



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LH 11/20/19

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56) Chlorobenzene-d5 (IS3)	17.61	82	460383	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	353962	11.488	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 91.92%				
57) Toluene-d8 (SS2)	15.74	98	1004523	12.469	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.76%				
73) Bromofluorobenzene (SS3)	19.00	174	393021	13.656	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.28%				
Target Compounds							Qvalue
2) Propene	4.10	42	70640	1.736	ng		97
3) Dichlorodifluoromethan...	4.27	85	83470	1.670	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1968	0.079	ng		92
10) Ethanol	6.32	45	596138	25.648	ng		99
12) Acrolein	6.80	56	2775	0.151	ng		96
13) Acetone	7.00	58	188513	8.716	ng	#	66
14) Trichlorofluoromethane	7.26	101	53147	1.244	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	324175	5.248	ng		99
21) Trichlorotrifluoroethane	8.86	151	9221	0.420	ng		99
22) Carbon Disulfide	8.71	76	57028	0.602	ng		99
27) 2-Butanone (MEK)	10.48	72	6668	0.387	ng	#	92
30) Ethyl Acetate	11.30	61	6303	0.693	ng	#	41
31) n-Hexane	11.28	57	389915	8.919	ng		99
32) Chloroform	11.32	83	7925	0.187	ng		100
41) Benzene	12.90	78	78336	0.780	ng		100
42) Carbon Tetrachloride	13.06	117	4878	0.167	ng		99
43) Cyclohexane	13.19	84	385005	10.319	ng		99
51) n-Heptane	14.33	71	141723	5.632	ng		98
53) 4-Methyl-2-pentanone	14.90	58	3856	0.162	ng	#	94
58) Toluene	15.84	91	159731	1.880	ng		100
63) n-Octane	16.85	57	67866	3.128	ng		98
64) Tetrachloroethene	16.99	166	7429	0.293	ng		100
66) Ethylbenzene	18.01	91	29523	0.286	ng		99
67) m- & p-Xylenes	18.16	91	117205	1.515	ng		98
70) o-Xylene	18.60	91	43532	0.594	ng		99
71) n-Nonane	18.80	43	82482	1.572	ng		98
74) Cumene	19.13	105	8986	0.093	ng		98
75) alpha-Pinene	19.48	93	19328	0.406	ng		93
76) n-Propylbenzene	19.58	91	12103	0.100	ng		84
78) 4-Ethyltoluene	19.70	105	7241	0.084	ng		98
79) 1,3,5-Trimethylbenzene	19.77	105	21660	0.275	ng		100
82) 1,2,4-Trimethylbenzene	20.13	105	38022	0.495	ng		90
91) d-Limonene	20.64	68	24261	0.839	ng		87
95) Naphthalene	22.24	128	6052	0.064	ng		91

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161918.D
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Sample : P1906559-002 (1000mL)
Misc : S31-10161904
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Nov 20 15:03:24 2019
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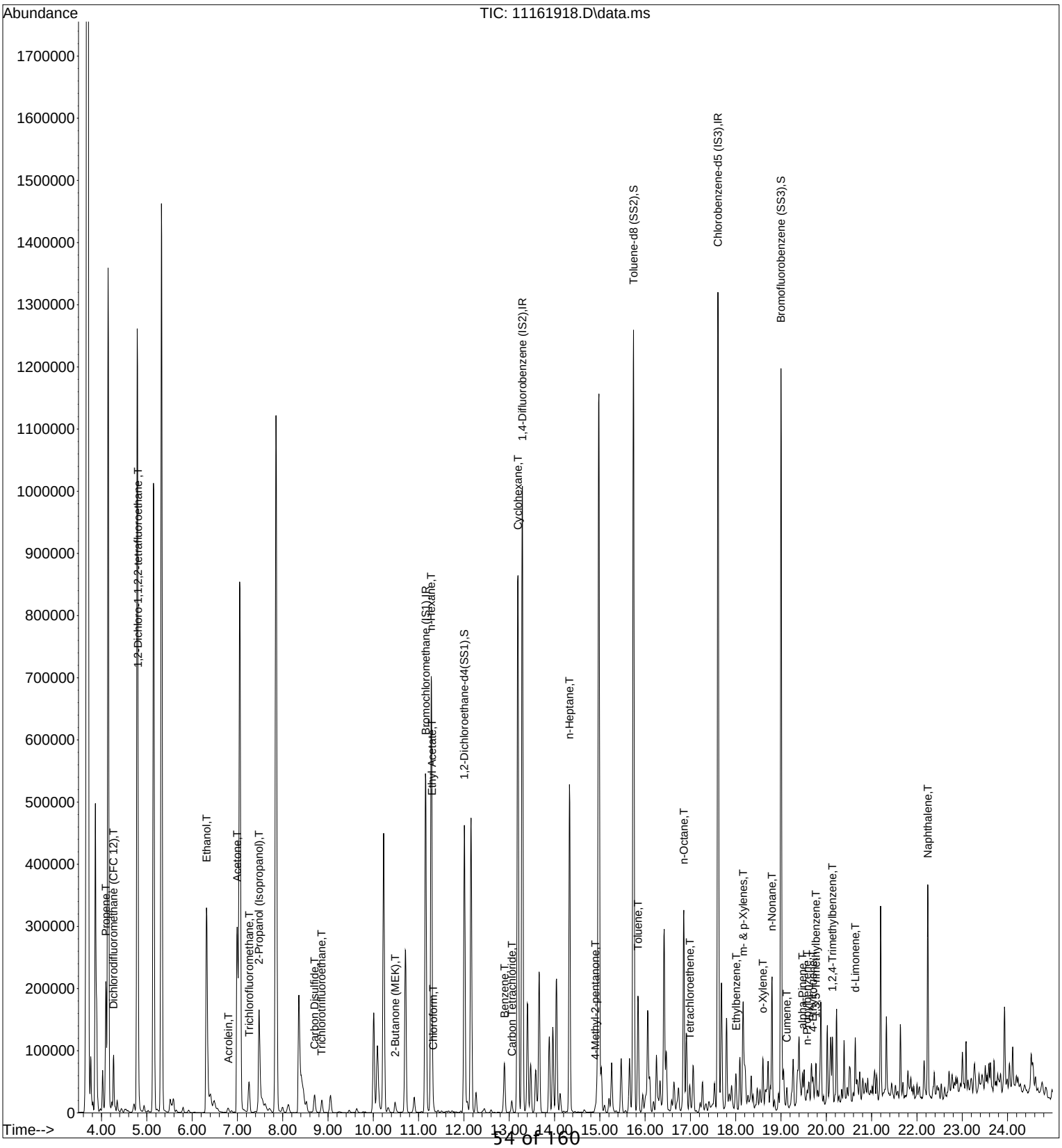
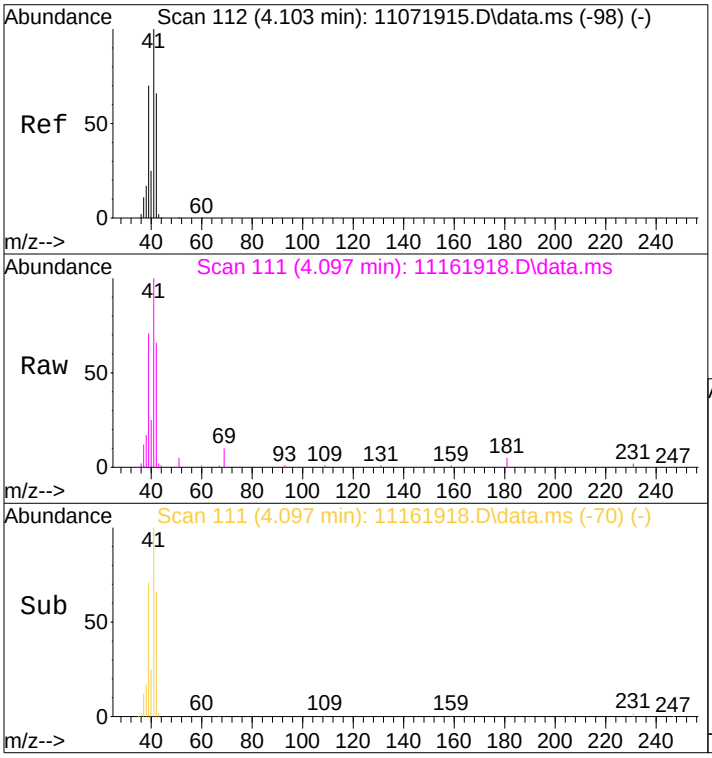
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

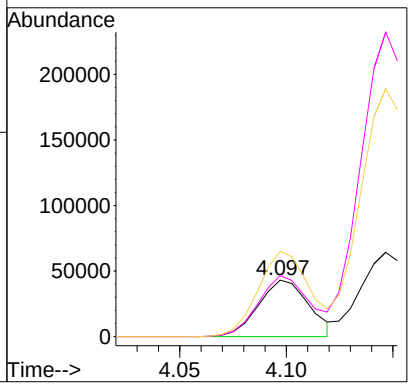


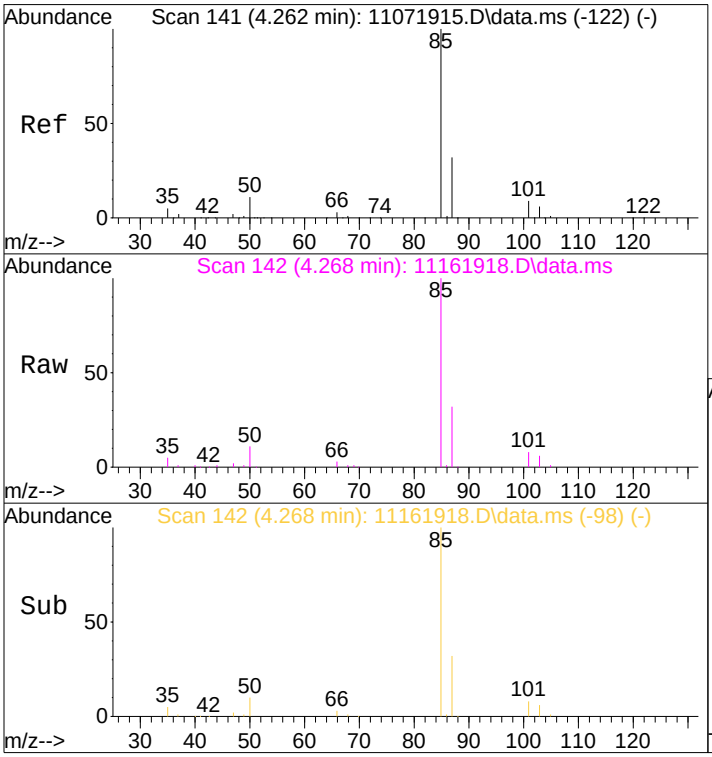


#2
Propene
Concen: 1.74 ng
RT: 4.10 min Scan# 111
Delta R.T. -0.022 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 42 Resp: 70640

Ion	Ratio	Lower	Upper
42	100		
39	111.5	87.0	127.0
41	154.7	132.2	172.2

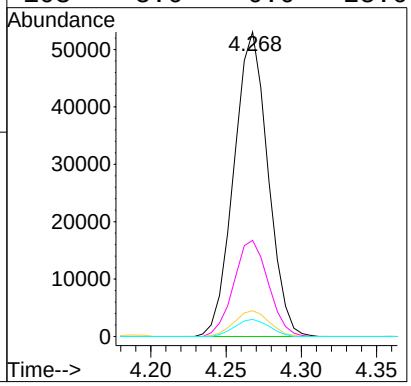


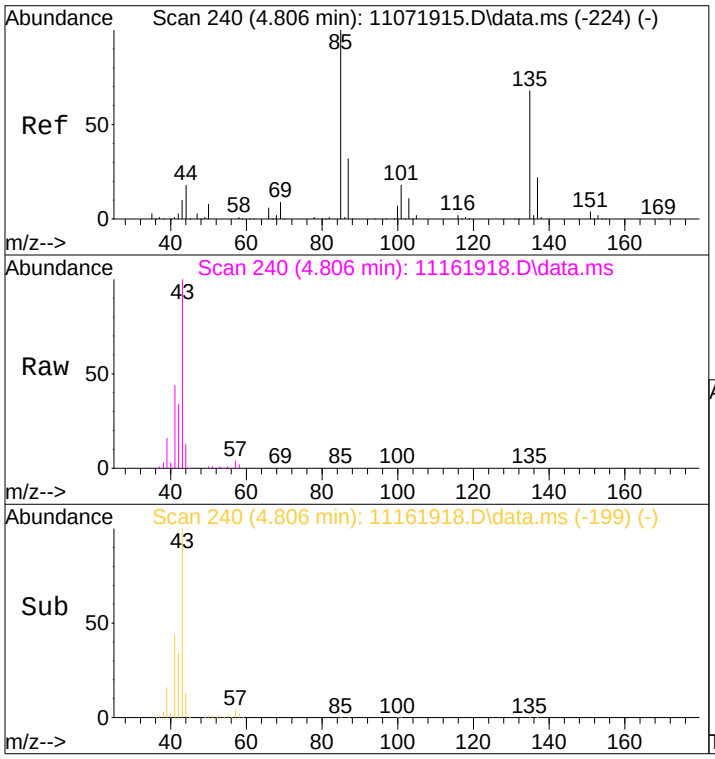


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.67 ng
RT: 4.27 min Scan# 142
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 85 Resp: 83470

Ion	Ratio	Lower	Upper
85	100		
87	32.0	12.3	52.3
101	8.7	0.0	28.6
103	5.6	0.0	25.6

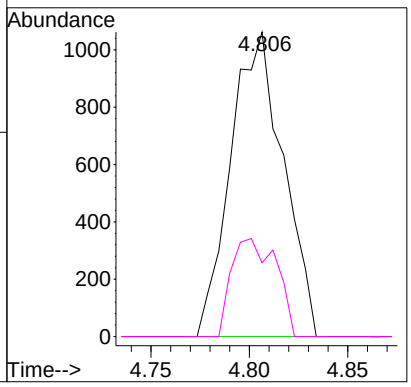


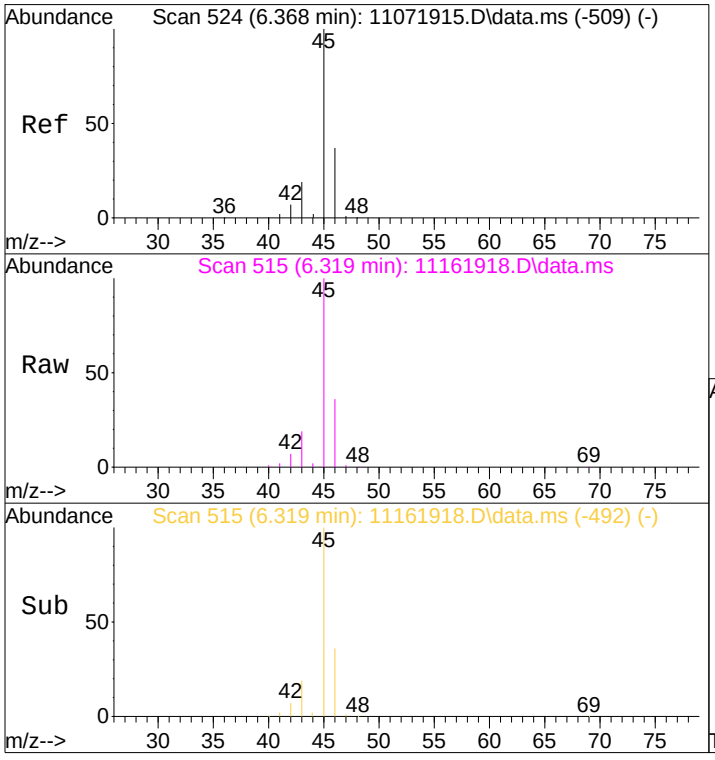


#5
1,2-Dichloro-1,1,2,2-tetrafluoroethane
Concen: 0.08 ng
RT: 4.81 min Scan# 240
Delta R.T. -0.022 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:135 Resp: 1968

Ion	Ratio	Lower	Upper
135	100		
137	27.4	12.0	52.0

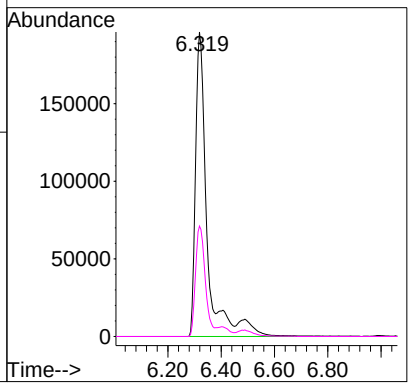


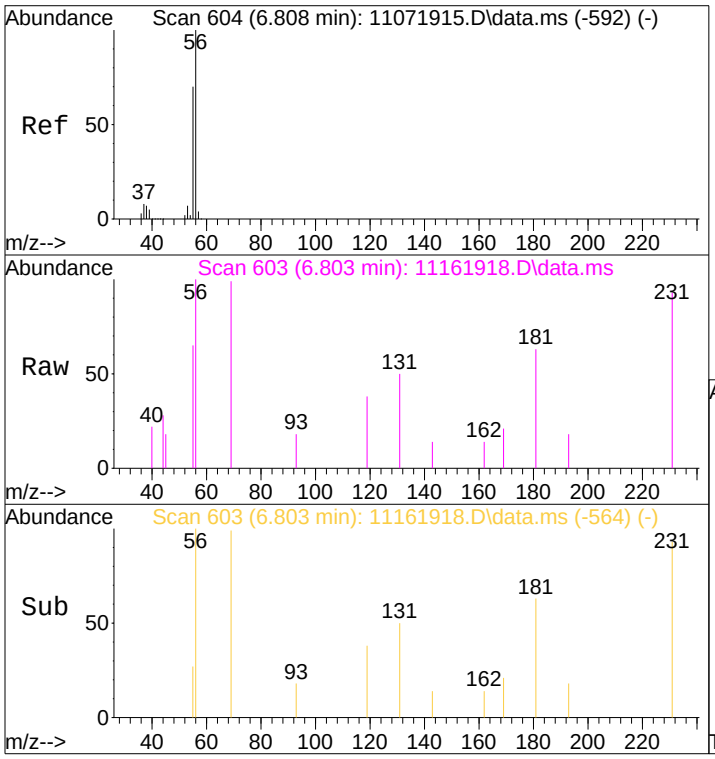


#10
Ethanol
Concen: 25.65 ng
RT: 6.32 min Scan# 515
Delta R.T. -0.121 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 45 Resp: 596138

Ion	Ratio	Lower	Upper
45	100		
46	36.9	17.3	57.3

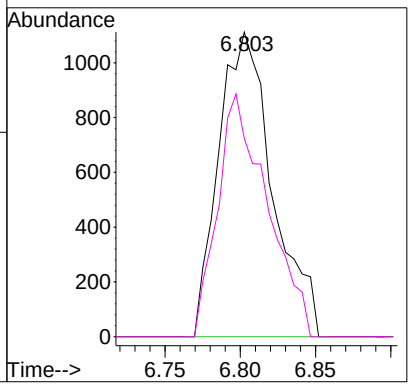


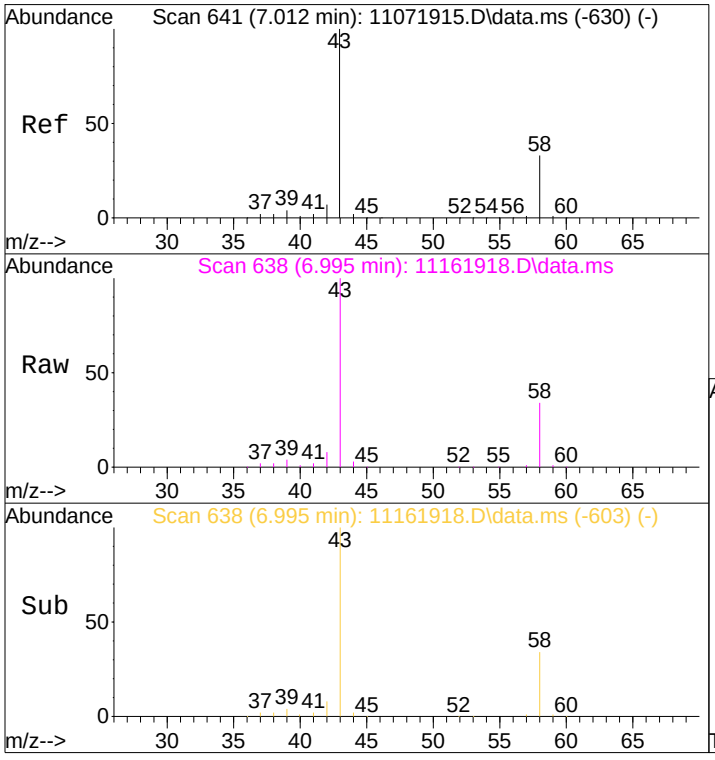


#12
Acrolein
Concen: 0.15 ng
RT: 6.80 min Scan# 603
Delta R.T. -0.033 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 56 Resp: 2775

Ion	Ratio	Lower	Upper
56	100		
55	73.0	49.7	89.7

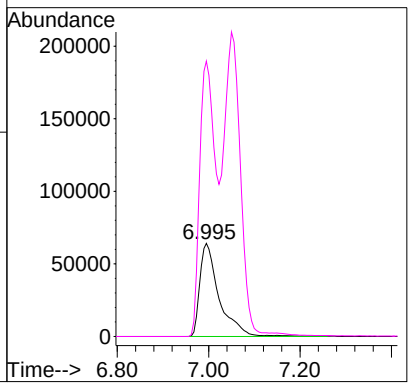


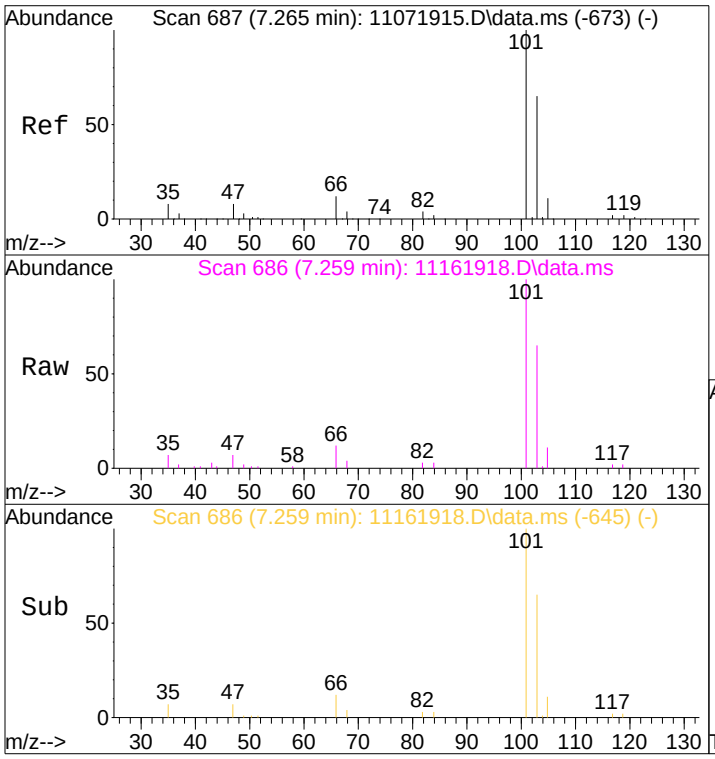


#13
Acetone
Concen: 8.72 ng
RT: 7.00 min Scan# 638
Delta R.T. -0.055 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 58 Resp: 188513

Ion	Ratio	Lower	Upper
58	100		
43	237.8	276.0	336.0#

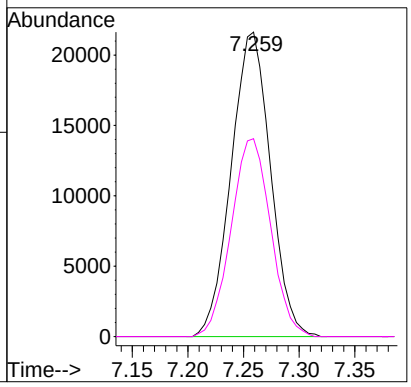


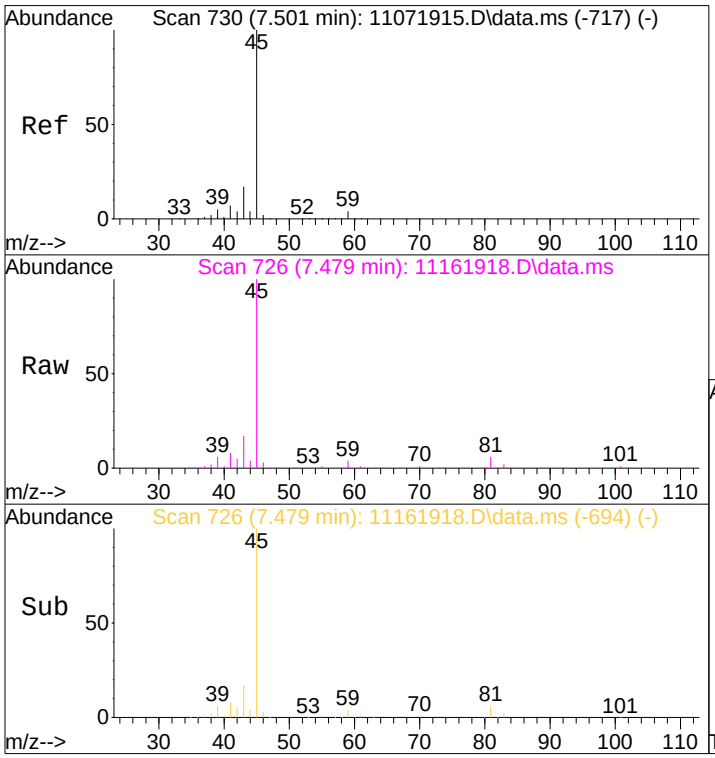


#14
Trichlorofluoromethane
Concen: 1.24 ng
RT: 7.26 min Scan# 686
Delta R.T. -0.022 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:101 Resp: 53147

Ion	Ratio	Lower	Upper
101	100		
103	65.3	44.8	84.8

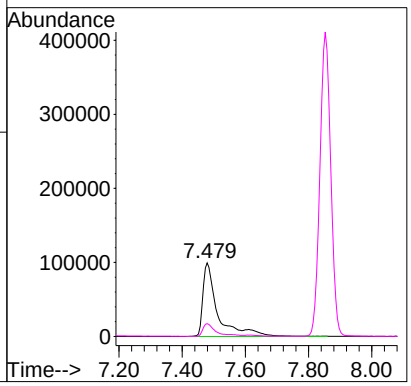


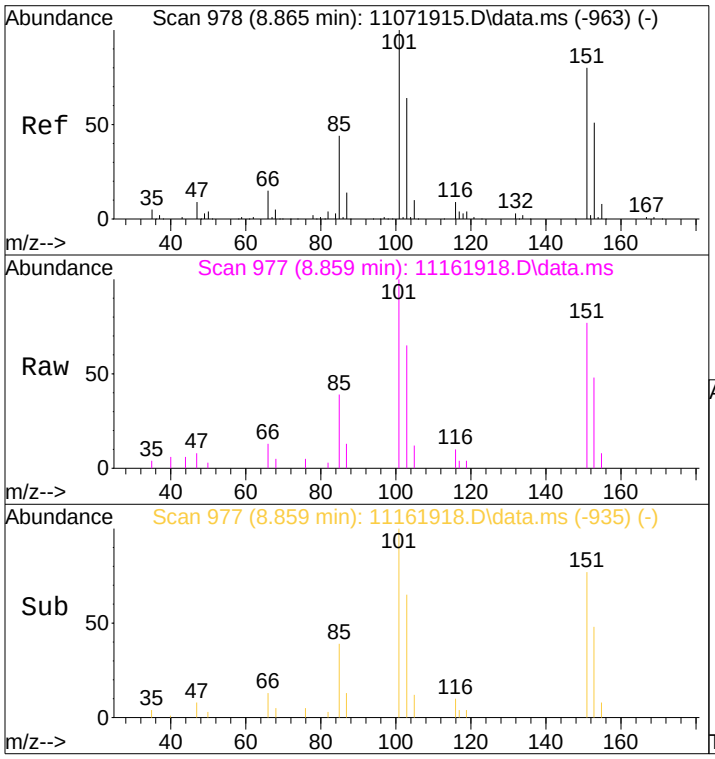


#15
2-Propanol (Isopropanol)
Concen: 5.25 ng
RT: 7.48 min Scan# 726
Delta R.T. -0.072 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 45 Resp: 324175

Ion	Ratio	Lower	Upper
45	100		
43	16.9	0.0	37.3

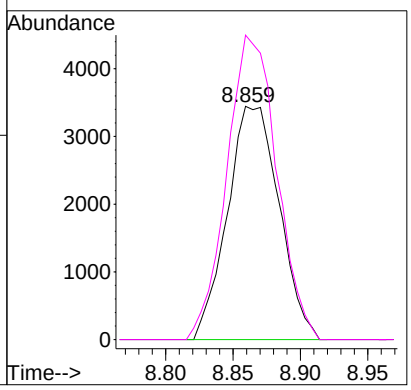


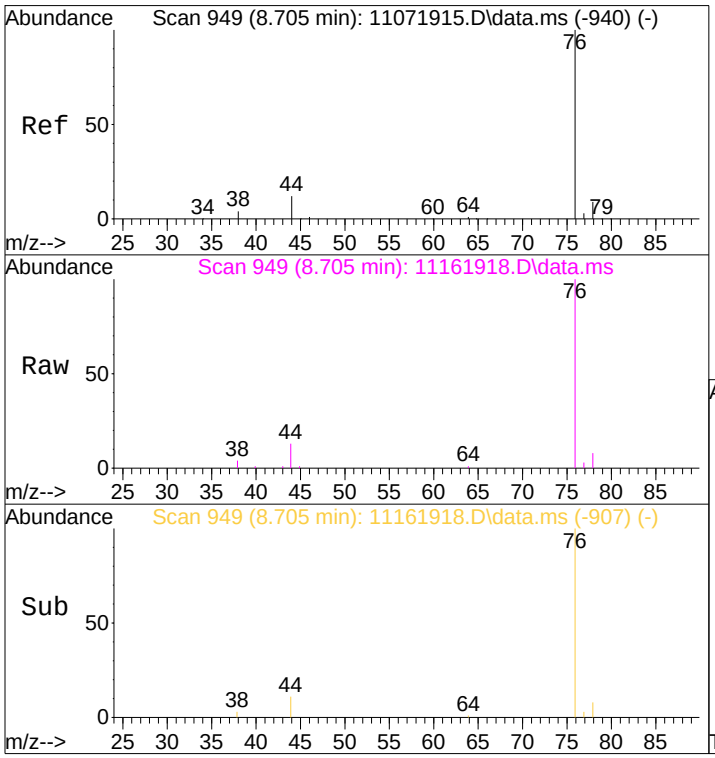


#21
Trichlorotrifluoroethane
Concen: 0.42 ng
RT: 8.86 min Scan# 977
Delta R.T. -0.017 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:151 Resp: 9221

Ion	Ratio	Lower	Upper
151	100		
101	125.8	104.6	144.6

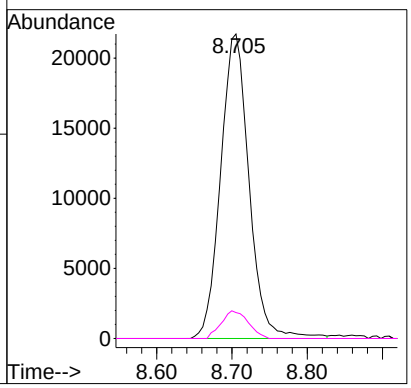


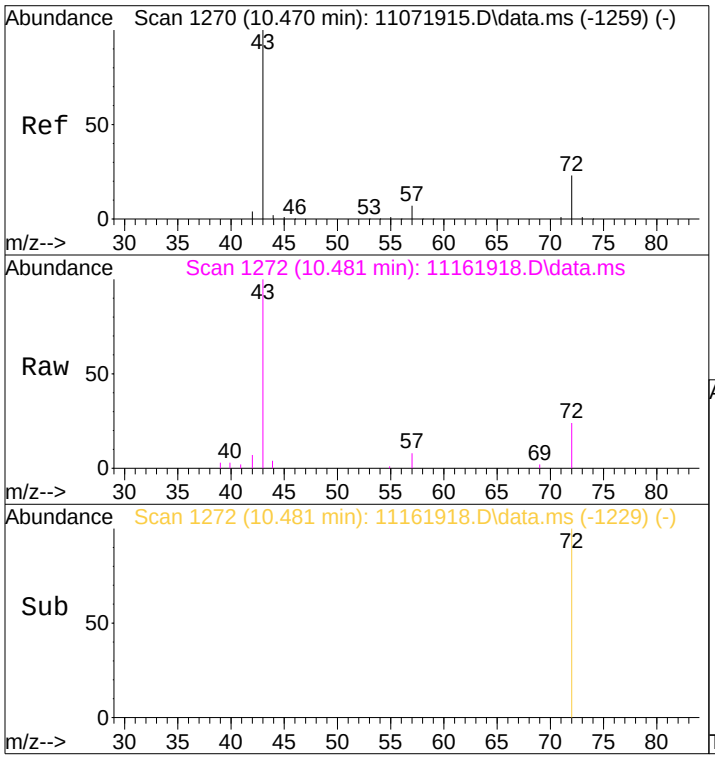


#22
Carbon Disulfide
Concen: 0.60 ng
RT: 8.71 min Scan# 949
Delta R.T. -0.017 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 76 Resp: 57028

Ion	Ratio	Lower	Upper
76	100		
78	8.6	0.0	29.1

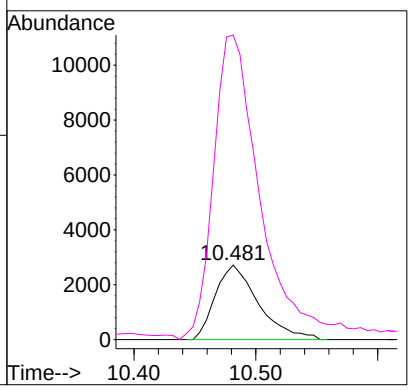


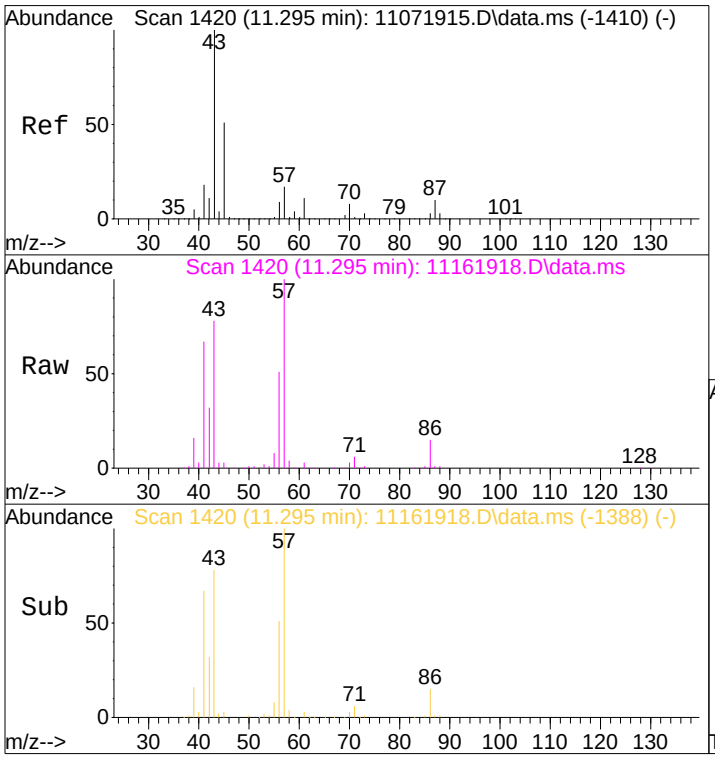


#27
2-Butanone (MEK)
Concen: 0.39 ng
RT: 10.48 min Scan# 1272
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 72 Resp: 6668

Ion	Ratio	Lower	Upper
72	100		
43	459.7	419.6	459.6#

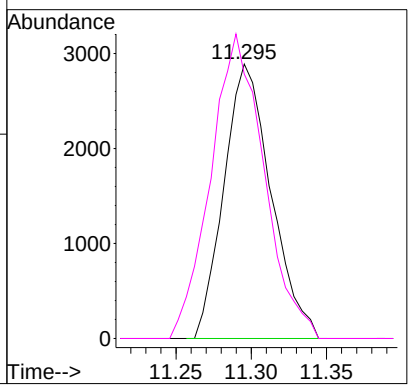


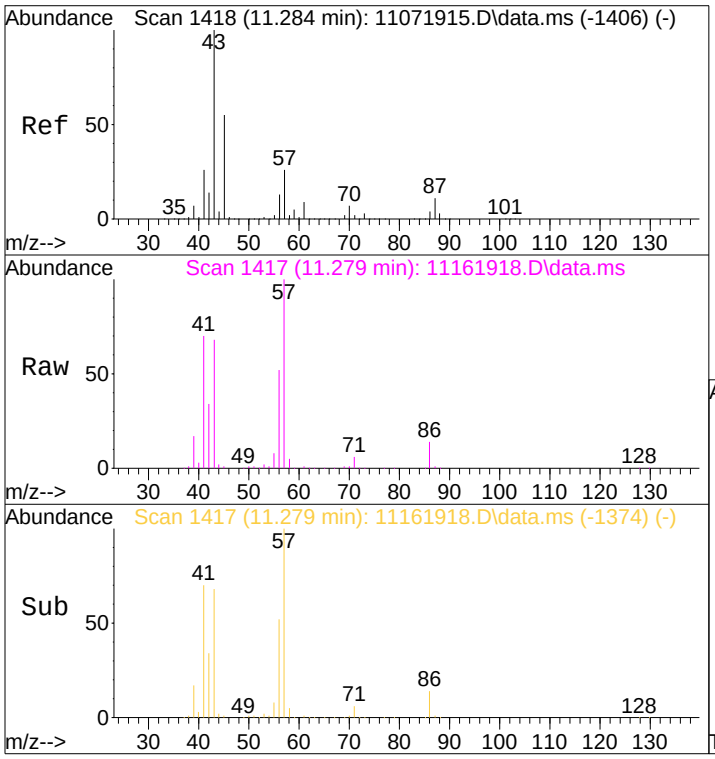


#30
Ethyl Acetate
Concen: 0.69 ng
RT: 11.30 min Scan# 1420
Delta R.T. -0.022 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 61 Resp: 6303

Ion	Ratio	Lower	Upper
61	100		
70	125.2	54.8	94.8#

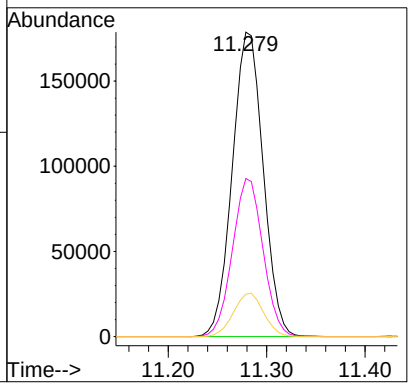


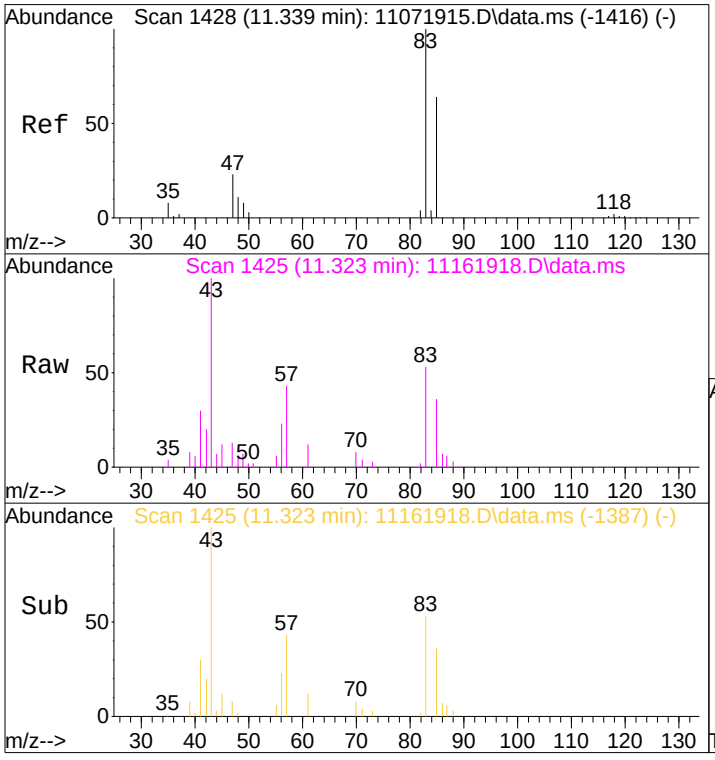


#31
n-Hexane
Concen: 8.92 ng
RT: 11.28 min Scan# 1417
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 57 Resp: 389915

Ion	Ratio	Lower	Upper
57	100		
56	51.3	40.7	61.1
86	13.9	12.0	18.0

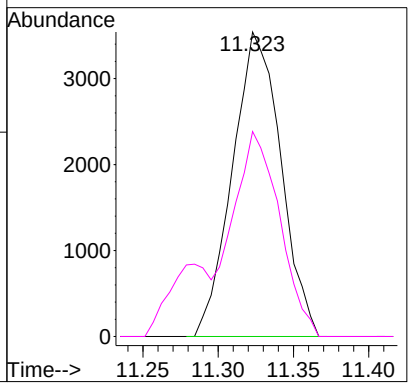


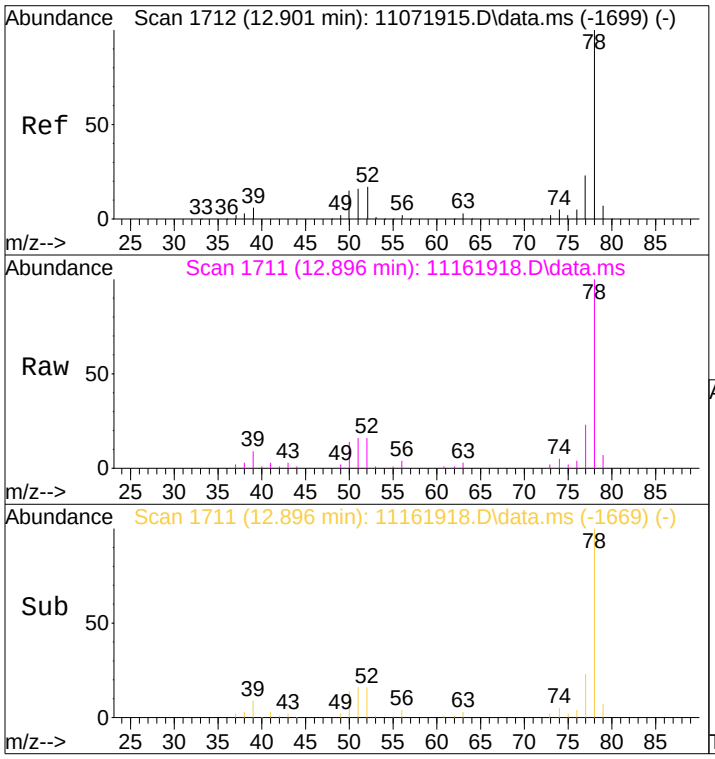


#32
Chloroform
Concen: 0.19 ng
RT: 11.32 min Scan# 1425
Delta R.T. -0.039 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 83 Resp: 7925

Ion	Ratio	Lower	Upper
83	100		
85	65.1	45.3	85.3

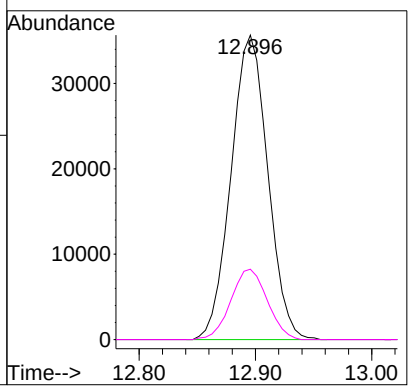


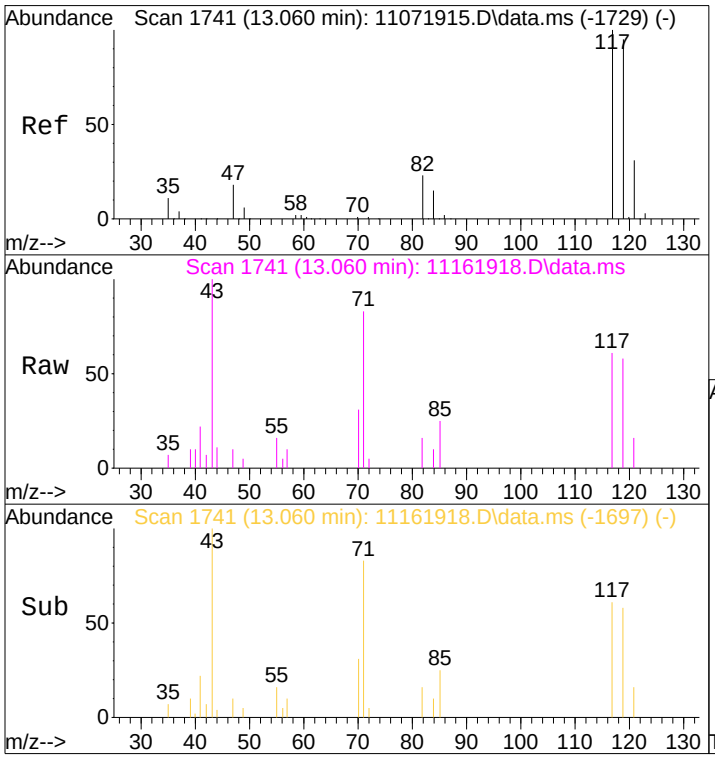


#41
Benzene
Concen: 0.78 ng
RT: 12.90 min Scan# 1711
Delta R.T. -0.017 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 78 Resp: 78336

Ion	Ratio	Lower	Upper
78	100		
77	23.0	3.2	43.2

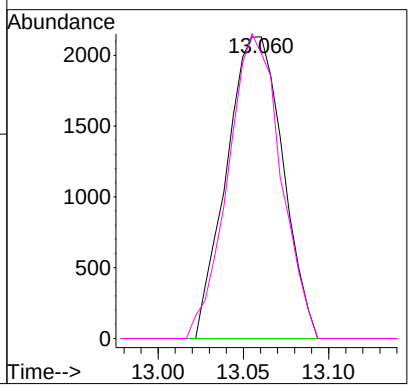


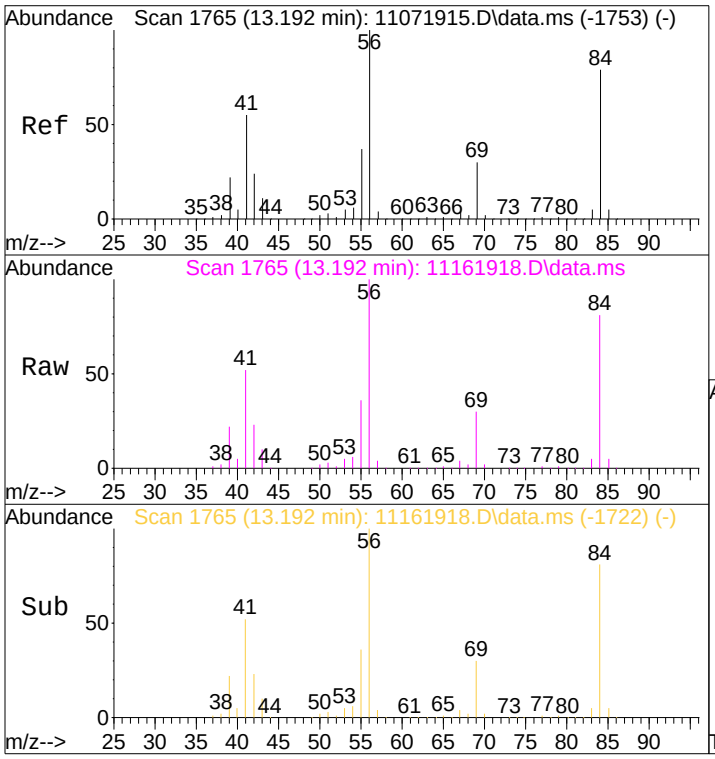


#42
Carbon Tetrachloride
Concen: 0.17 ng
RT: 13.06 min Scan# 1741
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:117 Resp: 4878

Ion	Ratio	Lower	Upper
117	100		
119	94.7	75.8	115.8

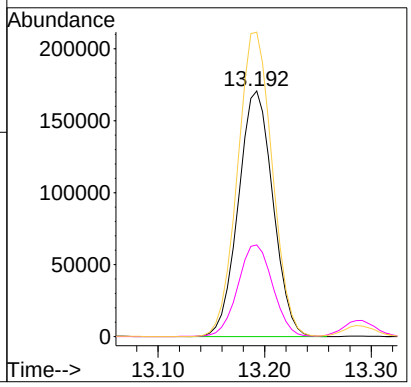


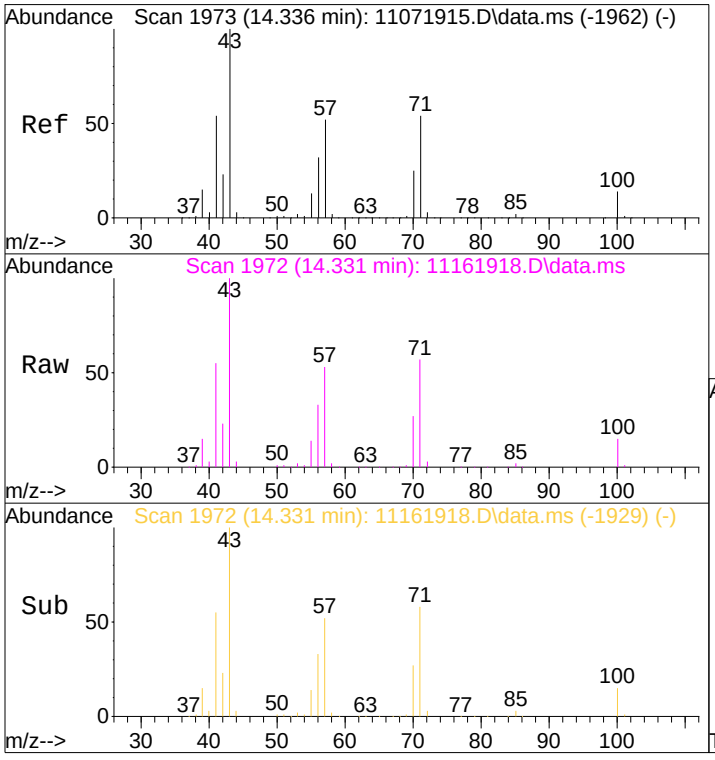


#43
Cyclohexane
Concen: 10.32 ng
RT: 13.19 min Scan# 1765
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 84 Resp: 385005

Ion	Ratio	Lower	Upper
84	100		
69	37.8	17.6	57.6
56	124.8	106.5	146.5

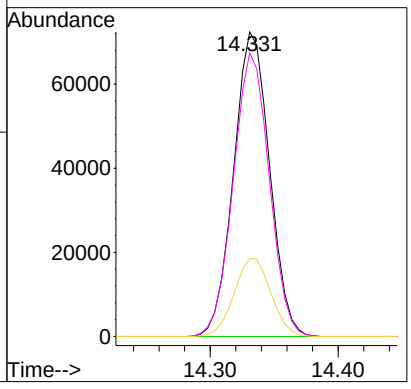


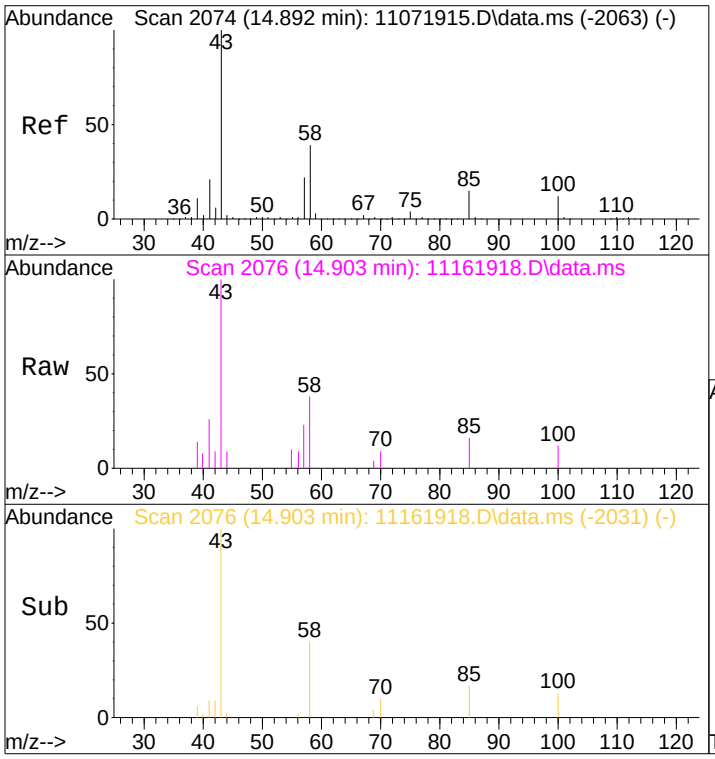


#51
n-Heptane
Concen: 5.63 ng
RT: 14.33 min Scan# 1972
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 71 Resp: 141723

Ion	Ratio	Lower	Upper
71	100		
57	93.3	75.9	115.9
100	26.2	6.0	46.0

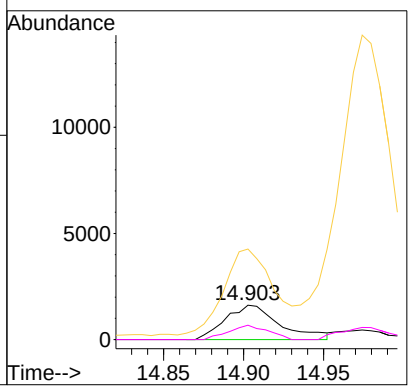


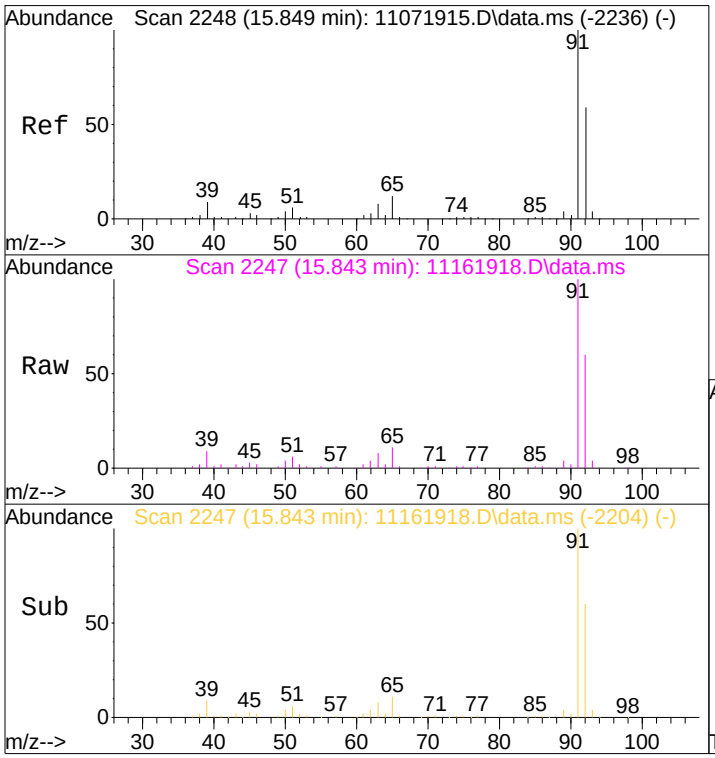


#53
4-Methyl-2-pentanone
Concen: 0.16 ng
RT: 14.90 min Scan# 2076
Delta R.T. -0.000 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 58 Resp: 3856

Ion	Ratio	Lower	Upper
58	100		
85	30.1	32.8	49.2#
43	249.6	205.2	307.8

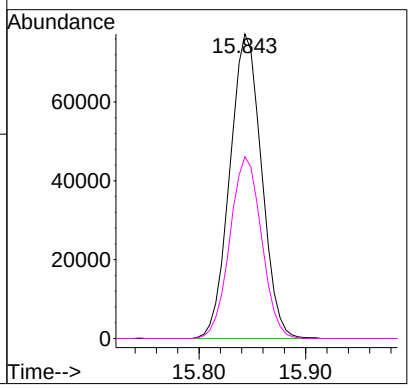


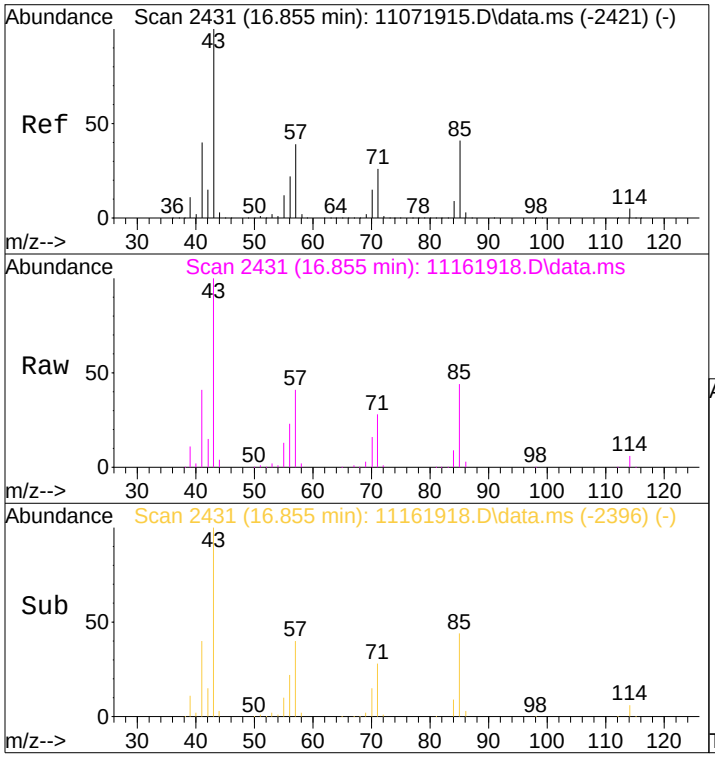


#58
Toluene
Concen: 1.88 ng
RT: 15.84 min Scan# 2247
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 91 Resp: 159731

Ion	Ratio	Lower	Upper
91	100		
92	59.4	39.4	79.4

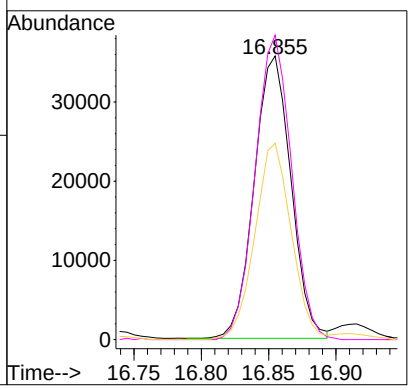


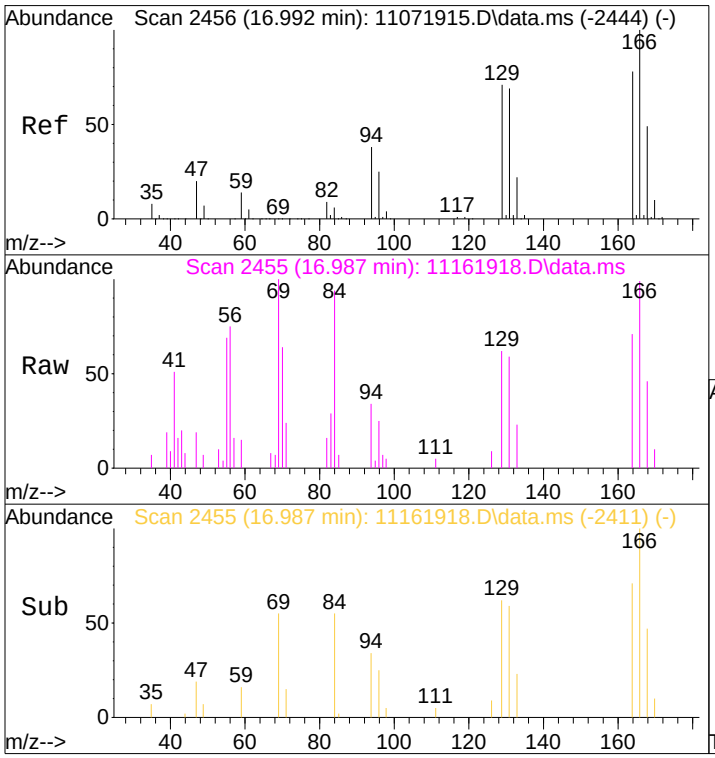


#63
n-Octane
Concen: 3.13 ng
RT: 16.85 min Scan# 2431
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 57 Resp: 67866

Ion	Ratio	Lower	Upper
57	100		
85	106.3	83.7	125.5
71	69.0	53.8	80.8

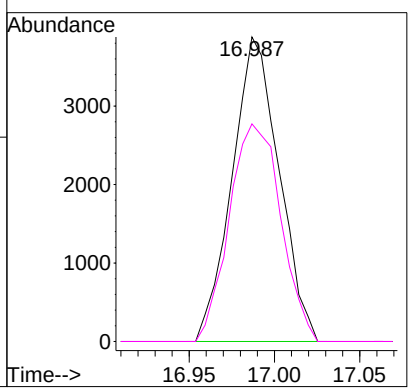


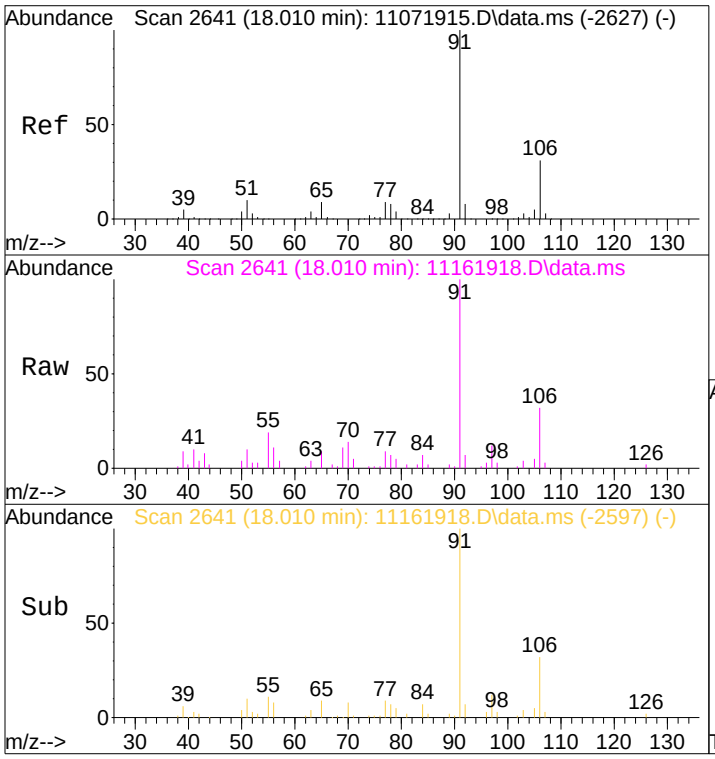


#64
Tetrachloroethene
Concen: 0.29 ng
RT: 16.99 min Scan# 2455
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:166 Resp: 7429

Ion	Ratio	Lower	Upper
166	100		
164	78.3	58.3	98.3

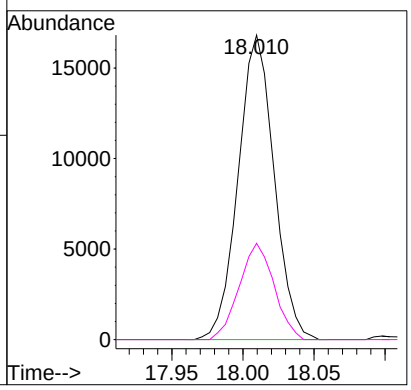


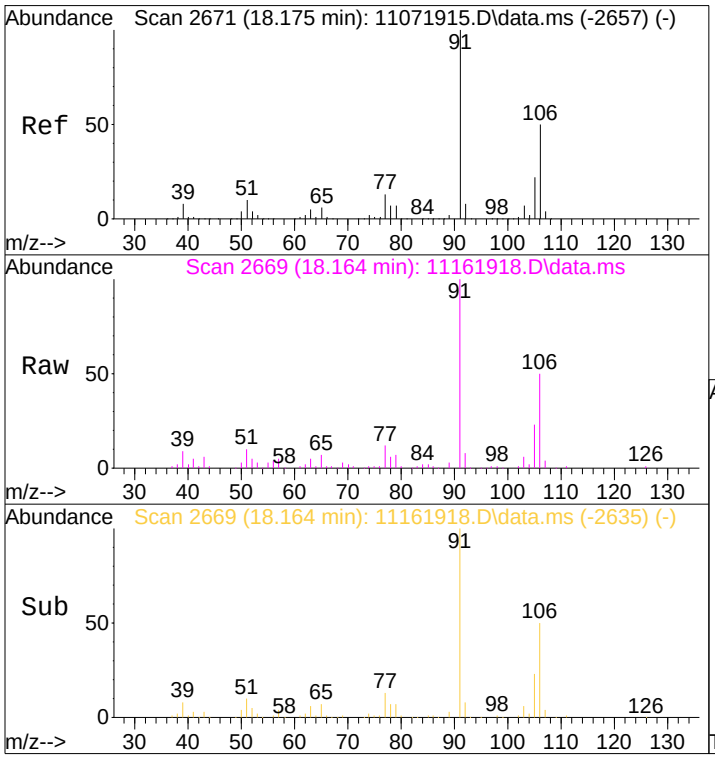


#66
Ethylbenzene
Concen: 0.29 ng
RT: 18.01 min Scan# 2641
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 91 Resp: 29523

Ion	Ratio	Lower	Upper
91	100		
106	30.7	11.2	51.2

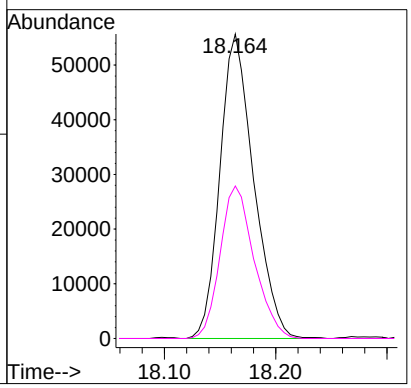


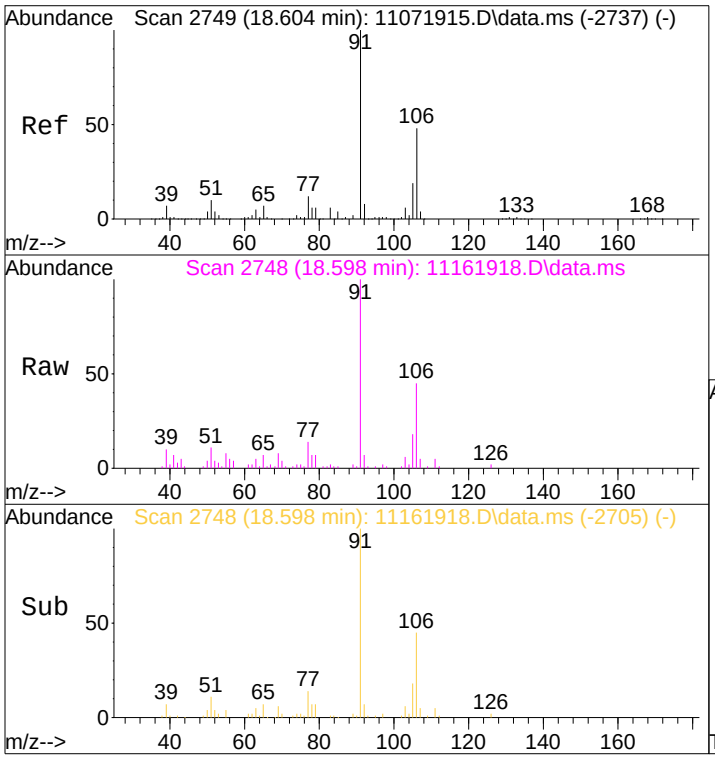


#67
m- & p-Xylenes
Concen: 1.51 ng
RT: 18.16 min Scan# 2669
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 91 Resp: 117205

Ion	Ratio	Lower	Upper
91	100		
106	50.4	29.0	69.0

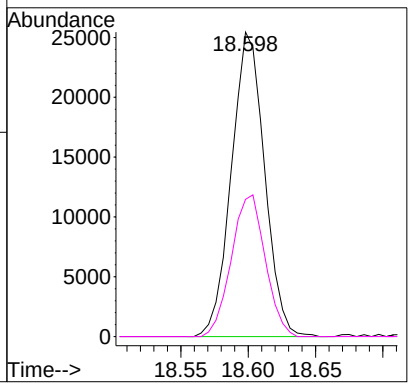


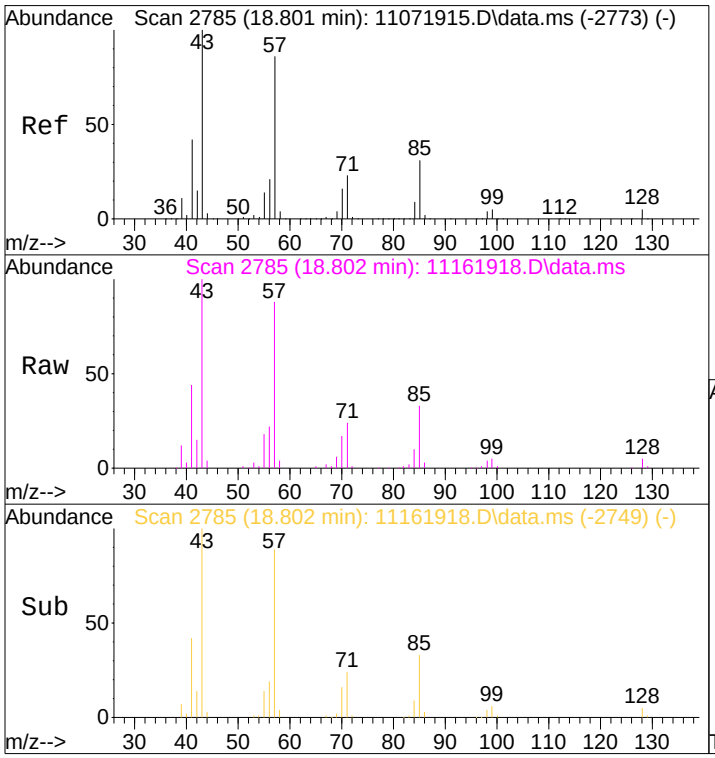


#70
o-Xylene
Concen: 0.59 ng
RT: 18.60 min Scan# 2748
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 91 Resp: 43532

Ion	Ratio	Lower	Upper
91	100		
106	47.5	28.0	68.0

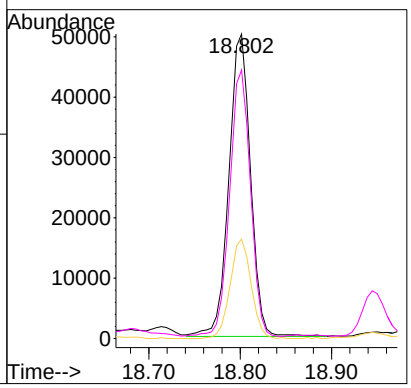


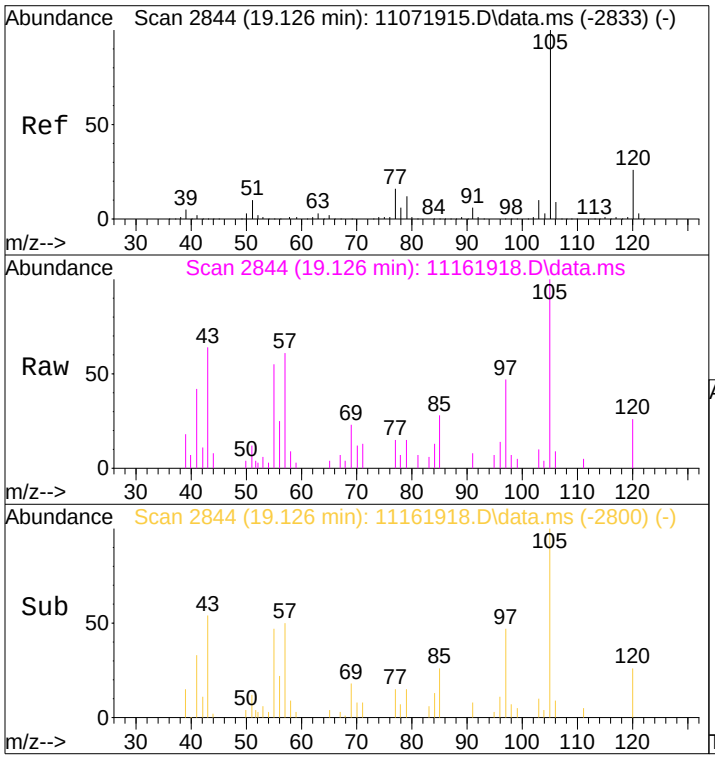


#71
n-Nonane
Concen: 1.57 ng
RT: 18.80 min Scan# 2785
Delta R.T. -0.000 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 43 Resp: 82482

Ion	Ratio	Lower	Upper
43	100		
57	84.7	65.8	105.8
85	31.8	10.4	50.4

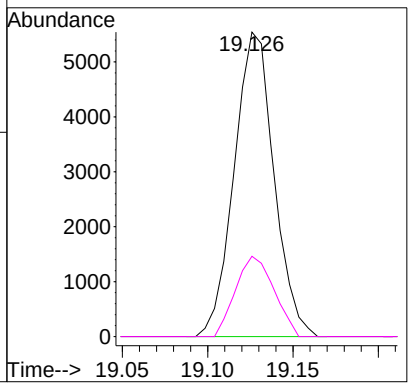


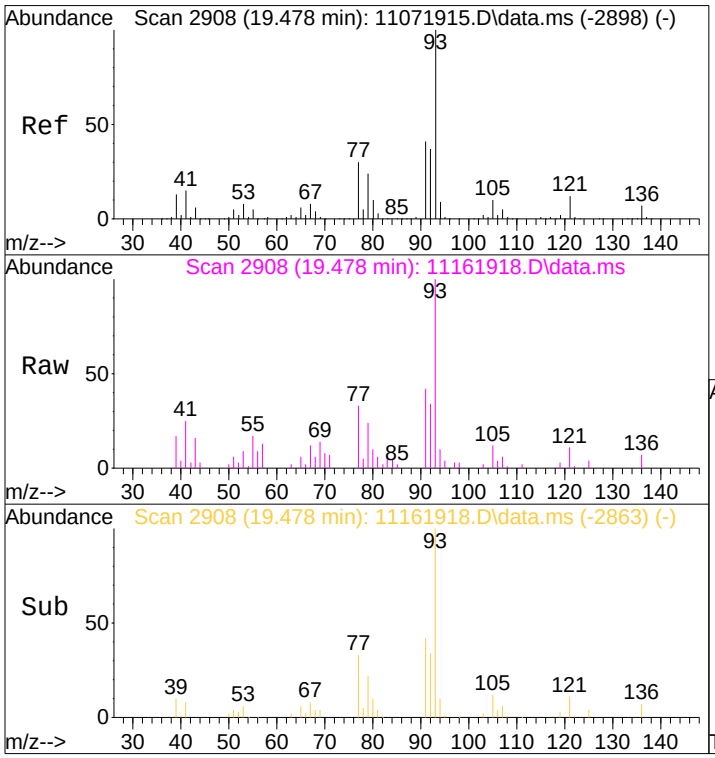


#74
Cumene
Concen: 0.09 ng
RT: 19.13 min Scan# 2844
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:105 Resp: 8986

Ion	Ratio	Lower	Upper
105	100		
120	25.5	6.6	46.6

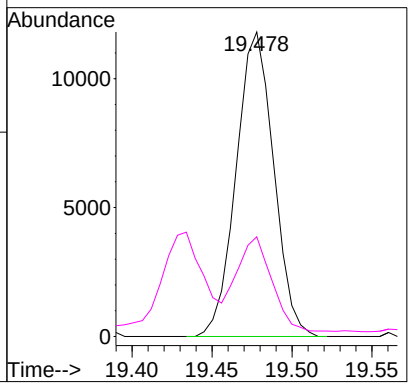


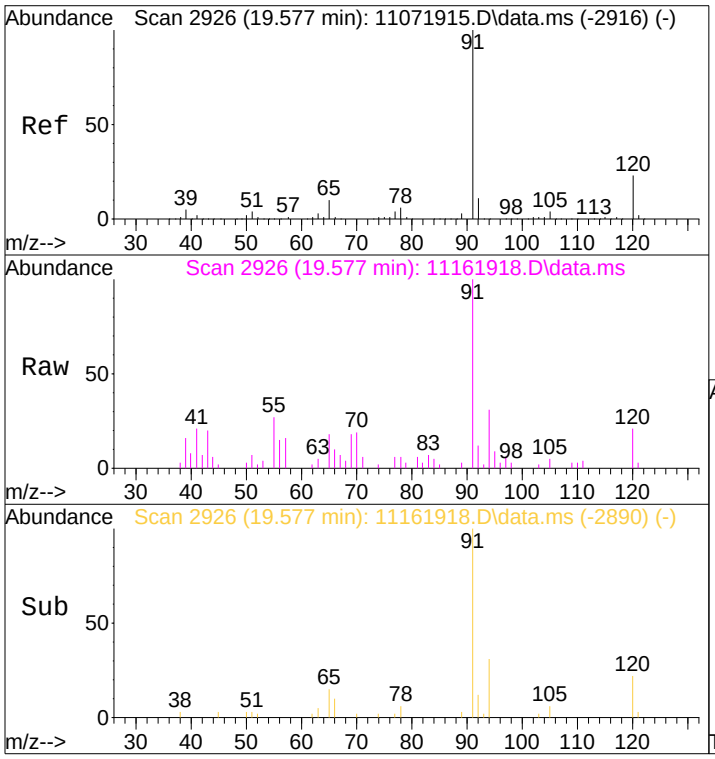


#75
alpha-Pinene
Concen: 0.41 ng
RT: 19.48 min Scan# 2908
Delta R.T. -0.000 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 93 Resp: 19328

Ion	Ratio	Lower	Upper
93	100		
77	34.7	10.7	50.7

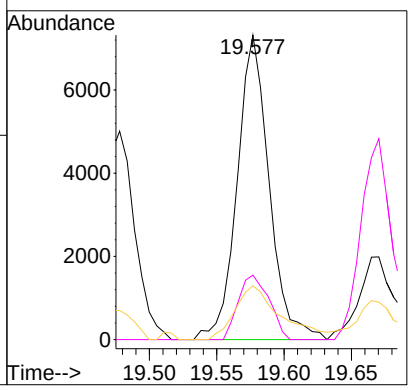


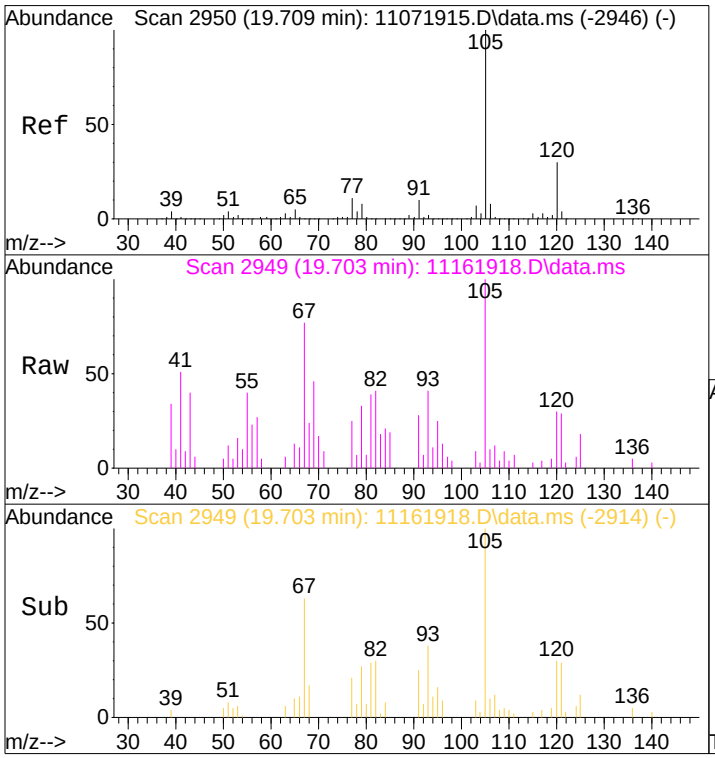


#76
n-Propylbenzene
Concen: 0.10 ng
RT: 19.58 min Scan# 2926
Delta R.T. -0.000 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 91 Resp: 12103

Ion	Ratio	Lower	Upper
91	100		
120	20.4	3.0	43.0
65	25.1	0.0	30.0

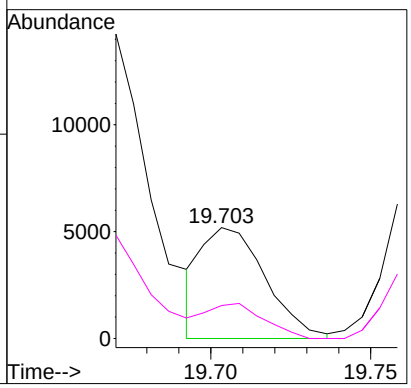


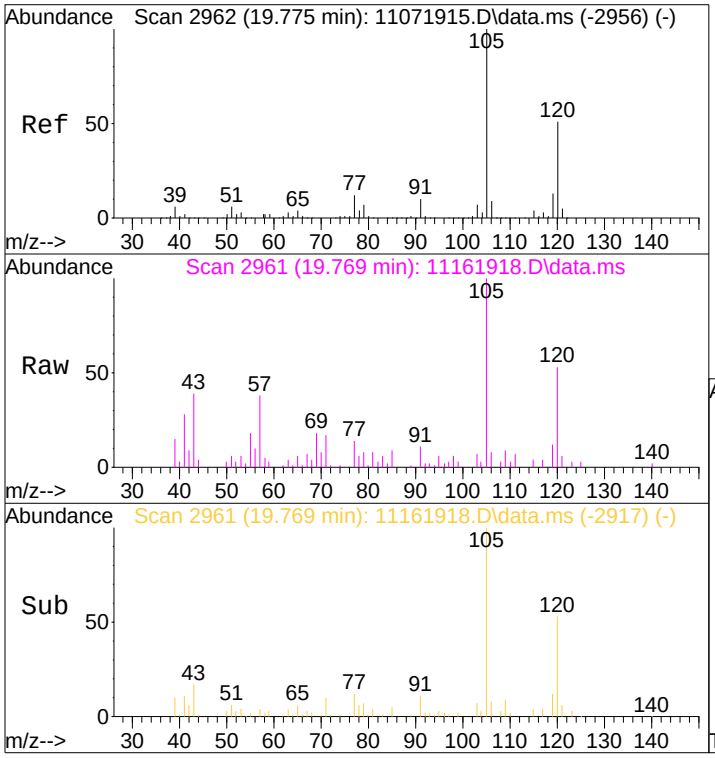


#78
4-Ethyltoluene
Concen: 0.08 ng
RT: 19.70 min Scan# 2949
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:105 Resp: 7241

Ion	Ratio	Lower	Upper
105	100		
120	29.2	10.5	50.5

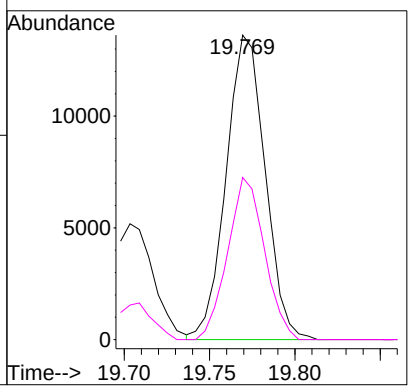


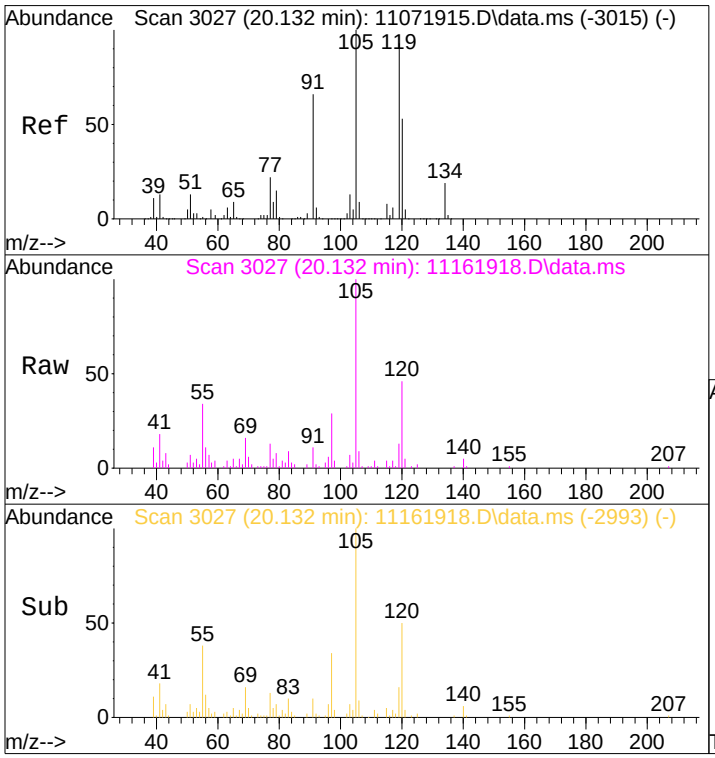


#79
1,3,5-Trimethylbenzene
Concen: 0.27 ng
RT: 19.77 min Scan# 2961
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:105 Resp: 21660

Ion	Ratio	Lower	Upper
105	100		
120	50.2	30.5	70.5

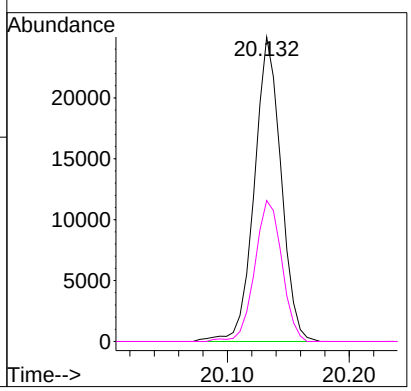


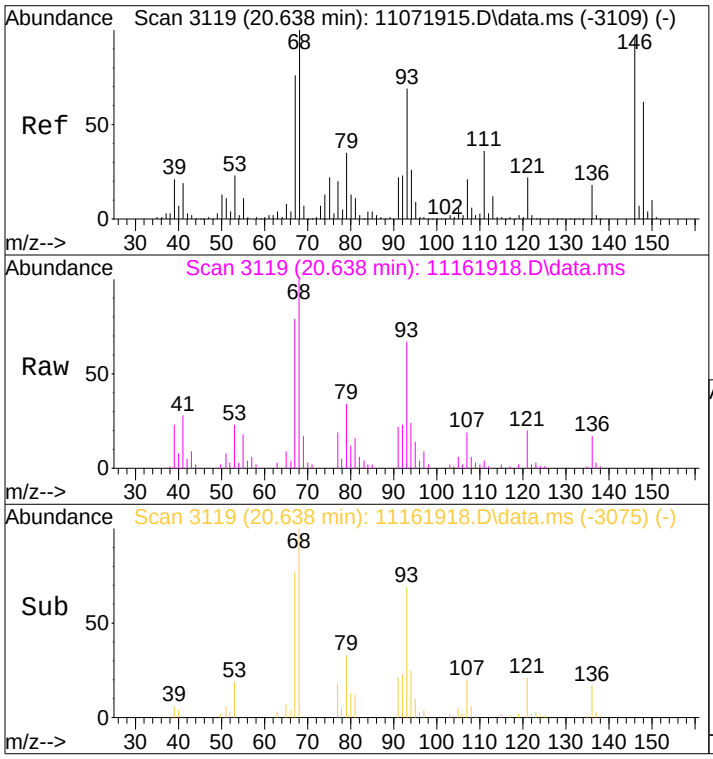


#82
1,2,4-Trimethylbenzene
Concen: 0.50 ng
RT: 20.13 min Scan# 3027
Delta R.T. -0.011 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:105 Resp: 38022

Ion	Ratio	Lower	Upper
105	100		
120	47.0	34.3	74.3

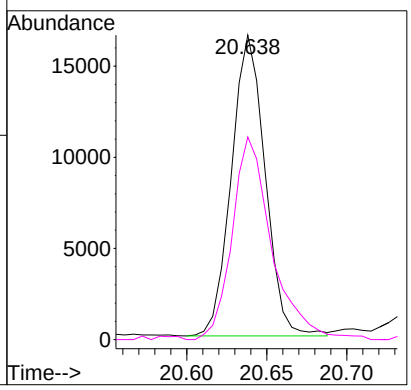


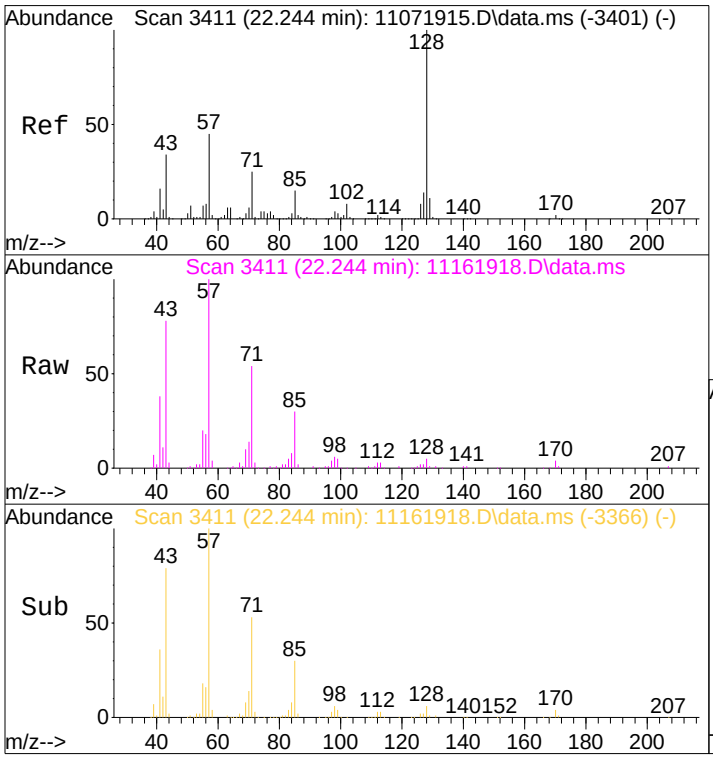


#91
d-Limonene
Concen: 0.84 ng
RT: 20.64 min Scan# 3119
Delta R.T. -0.006 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion: 68 Resp: 24261

Ion	Ratio	Lower	Upper
68	100		
93	79.3	49.1	89.1

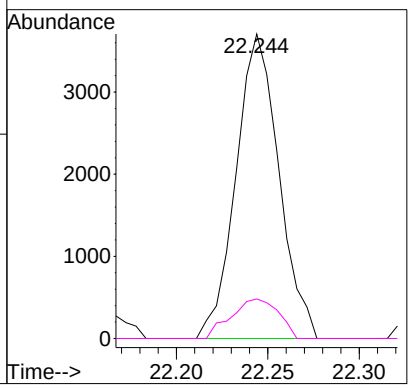




#95
Naphthalene
Concen: 0.06 ng
RT: 22.24 min Scan# 3411
Delta R.T. -0.000 min
Lab File: 11161918.D
Acq: 16 Nov 2019 13:04

Tgt Ion:128 Resp: 6052

Ion	Ratio	Lower	Upper
128	100		
129	14.3	0.0	30.9



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161919.D
Acq On : 16 Nov 2019 13:38 Operator: WA
Sample : P1906559-003 (1000mL)
Misc : S31-10161904 pf2
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 15:05:55 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	238928	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	1005604	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	456267	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	354054	11.579	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.64%				
57) Toluene-d8 (SS2)	15.74	98	1003899	12.574	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.56%				
73) Bromofluorobenzene (SS3)	19.00	174	389779	13.666	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.36%				
Target Compounds							Qvalue
2) Propene	4.13	42	28501	0.706	ng	#	84
3) Dichlorodifluoromethan...	4.28	85	70945	1.430	ng		100
4) Chloromethane	4.56	50	2901	0.085	ng		95
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	1610	0.065	ng		91
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	5.68	94	234	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.32	45	30257	1.312	ng		95
11) Acetonitrile	6.61	41	4029	0.070	ng		90
12) Acrolein	6.81	56	1650	0.090	ng		93
13) Acetone	7.02	58	42005	1.957	ng		98
14) Trichlorofluoromethane	7.27	101	31995	0.755	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	154365	2.518	ng		96
16) Acrylonitrile	7.86	53	170	N.D.			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D. d			
19) Methylene Chloride	8.44	84	3897	0.147	ng		97
20) 3-Chloro-1-propene (Al...	8.44	41	342	N.D.			
21) Trichlorotrifluoroethane	8.87	151	7301	0.335	ng		97
22) Carbon Disulfide	8.71	76	22730	0.242	ng		97
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	10.10	73	1478	N.D.			
26) Vinyl Acetate	10.18	86	1286	0.322	ng	#	75
27) 2-Butanone (MEK)	10.48	72	3901	0.228	ng		93
28) cis-1,2-Dichloroethene	10.98	61	373	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	11.30	61	5271	0.584	ng		99
31) n-Hexane	11.28	57	3789	0.087	ng	#	94
32) Chloroform	11.32	83	1785	N.D.			
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.13	62	880	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	0.00	56	0	N.D. d			
41) Benzene	12.90	78	10757	0.106	ng		98
42) Carbon Tetrachloride	13.06	117	7846	0.265	ng		98
43) Cyclohexane	13.19	84	1159	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	13.71	83	234	N.D.			
47) Trichloroethene	14.00	130	3518	0.142	ng		100
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	14.07	57	2906	N.D.			

Data File: I:\MS16\DATA\2019_11\16\11161919.D
Acq On : 16 Nov 2019 13:38 Operator: WA
Sample : P1906559-003 (1000mL)
Misc : S31-10161904 pf2
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 15:05:55 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

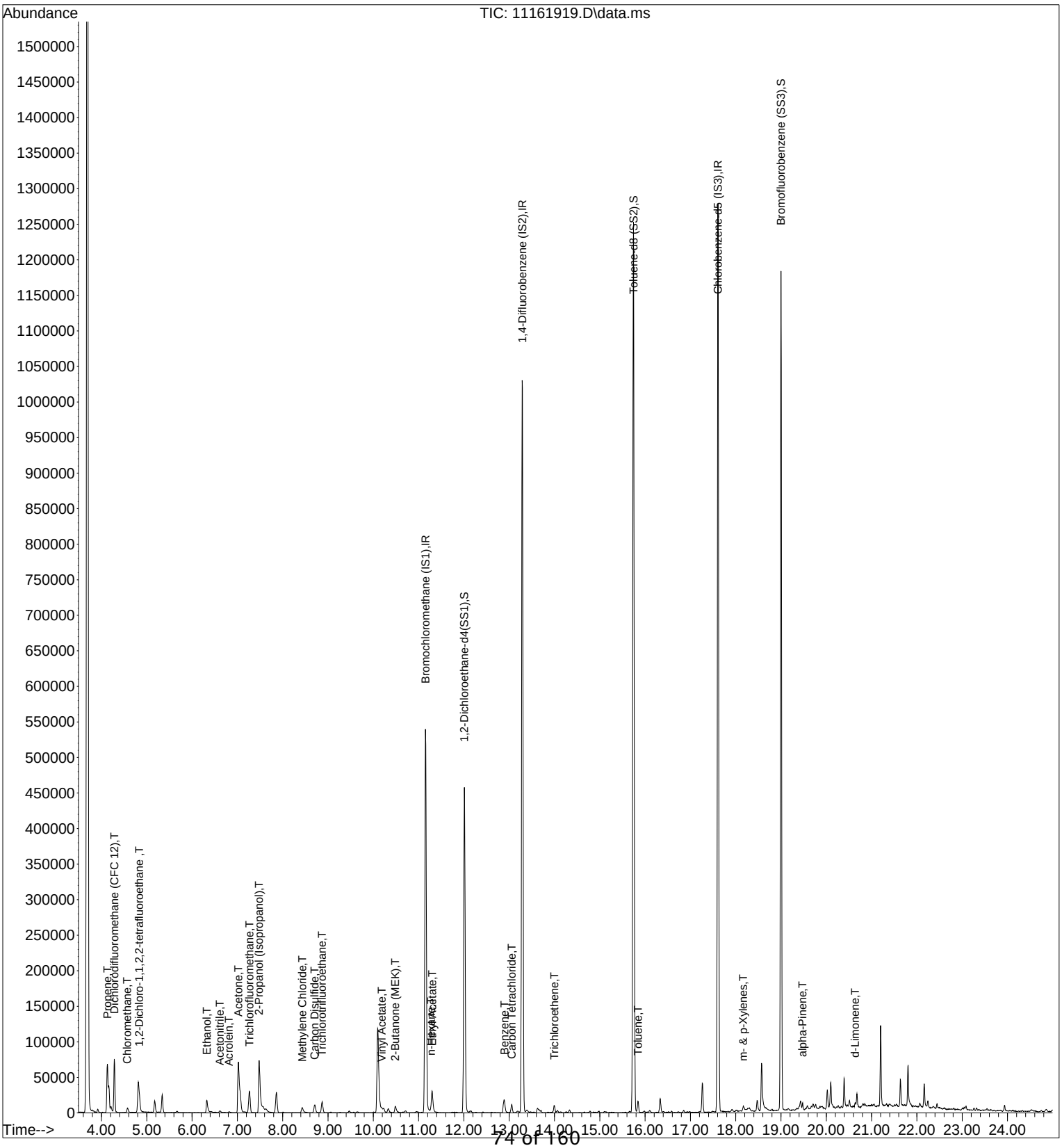
Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	14.33	71	800	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.84	91	13241	0.157 ng		100
59) 2-Hexanone	16.11	43	2134	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.73	43	1785	N.D.		
63) n-Octane	16.86	57	846	N.D.		
64) Tetrachloroethene	16.99	166	551	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	18.00	91	2110	N.D.		
67) m- & p-Xylenes	18.16	91	4064	0.053 ng		94
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.49	104	653	N.D.		
70) o-Xylene	18.60	91	1670	N.D.		
71) n-Nonane	18.80	43	800	N.D.		
72) 1,1,2,2-Tetrachloroethane	18.54	83	432	N.D.		
74) Cumene	19.13	105	177	N.D.		
75) alpha-Pinene	19.48	93	3964	0.084 ng	#	1
76) n-Propylbenzene	19.58	91	877	N.D.		
77) 3-Ethyltoluene	19.67	105	1174	N.D.		
78) 4-Ethyltoluene	19.71	105	831	N.D.		
79) 1,3,5-Trimethylbenzene	19.77	105	463	N.D.		
80) alpha-Methylstyrene	19.91	118	655	N.D.		
81) 2-Ethyltoluene	19.94	105	809	N.D.		
82) 1,2,4-Trimethylbenzene	20.13	105	1645	N.D.		
83) n-Decane	20.22	57	642	N.D.		
84) Benzyl Chloride	20.26	91	491	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	491	N.D.		
86) 1,4-Dichlorobenzene	20.32	146	491	N.D.		
87) sec-Butylbenzene	20.37	105	164	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D. d		
89) 1,2,3-Trimethylbenzene	20.51	105	842	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.63	68	1799	0.063 ng		92
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	21.33	57	1020	N.D.		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	22.24	128	3011	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	20.09	119	789	N.D.		
100) n-Butylbenzene	20.87	91	1330	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161919.D
Acq On : 16 Nov 2019 13:38 Operator: WA
Sample : P1906559-003 (1000mL)
Misc : S31-10161904 pf2
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 15:05:55 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161919.D
Acq On : 16 Nov 2019 13:38 Operator: WA
Sample : P1906559-003 (1000mL)
Misc : S31-10161904 pf2
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Quant Time: Nov 20 15:05:55 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

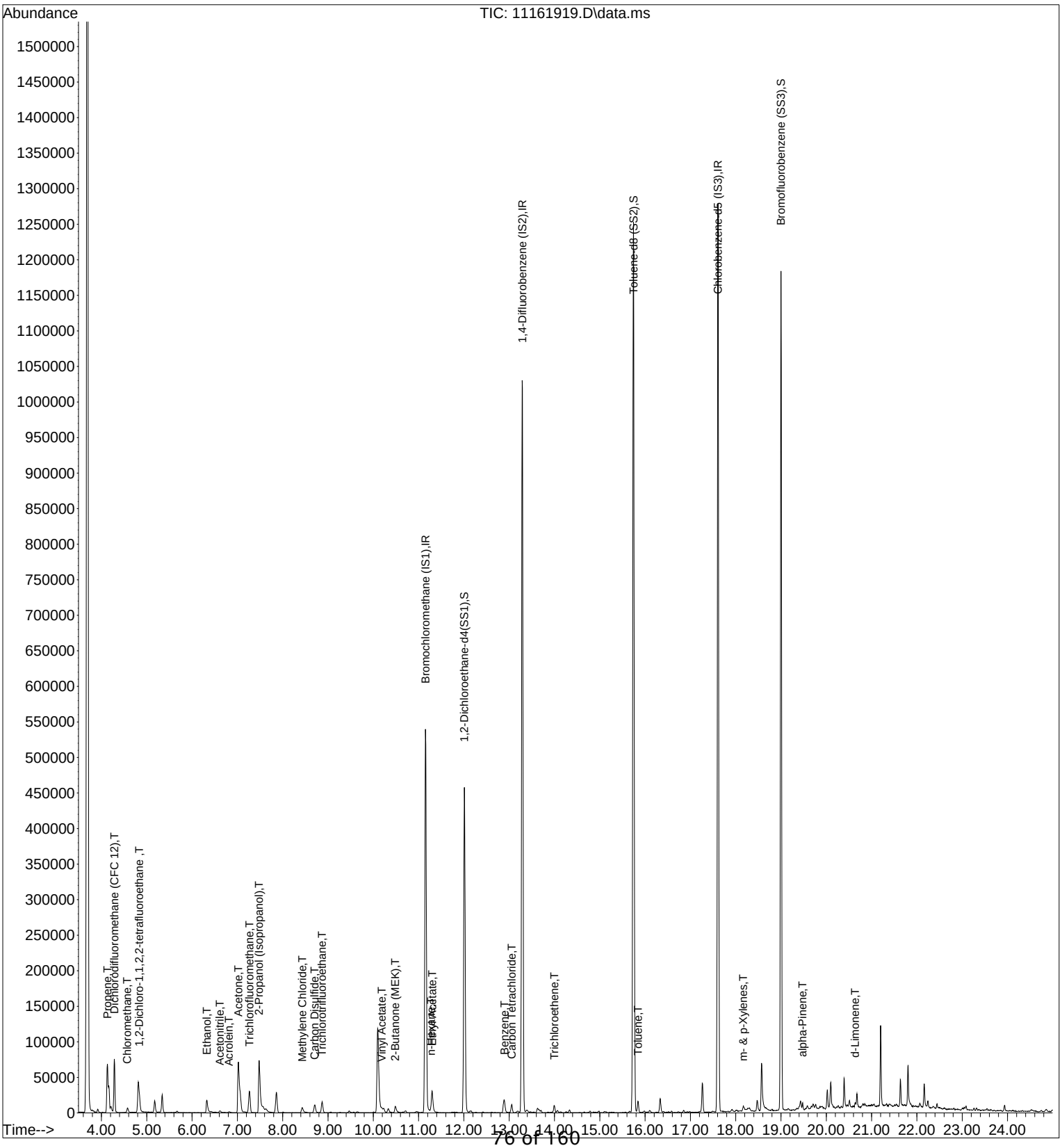
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	238928	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	1005604	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	456267	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	354054	11.579	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.64%				
57) Toluene-d8 (SS2)	15.74	98	1003899	12.574	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.56%				
73) Bromofluorobenzene (SS3)	19.00	174	389779	13.666	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.36%				
Target Compounds							Qvalue
2) Propene	4.13	42	28501	0.706	ng	#	84
3) Dichlorodifluoromethan...	4.28	85	70945	1.430	ng		100
4) Chloromethane	4.56	50	2901	0.085	ng		95
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	1610	0.065	ng		91
10) Ethanol	6.32	45	30257	1.312	ng		95
11) Acetonitrile	6.61	41	4029	0.070	ng		90
12) Acrolein	6.81	56	1650	0.090	ng		93
13) Acetone	7.02	58	42005	1.957	ng		98
14) Trichlorofluoromethane	7.27	101	31995	0.755	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	154365	2.518	ng		96
19) Methylene Chloride	8.44	84	3897	0.147	ng		97
21) Trichlorotrifluoroethane	8.87	151	7301	0.335	ng		97
22) Carbon Disulfide	8.71	76	22730	0.242	ng		97
26) Vinyl Acetate	10.18	86	1286	0.322	ng	#	75
27) 2-Butanone (MEK)	10.48	72	3901	0.228	ng		93
30) Ethyl Acetate	11.30	61	5271	0.584	ng		99
31) n-Hexane	11.28	57	3789	0.087	ng	#	94
41) Benzene	12.90	78	10757	0.106	ng		98
42) Carbon Tetrachloride	13.06	117	7846	0.265	ng		98
47) Trichloroethene	14.00	130	3518	0.142	ng		100
58) Toluene	15.84	91	13241	0.157	ng		100
67) m- & p-Xylenes	18.16	91	4064	0.053	ng		94
75) alpha-Pinene	19.48	93	3964	0.084	ng	#	1
91) d-Limonene	20.63	68	1799	0.063	ng		92

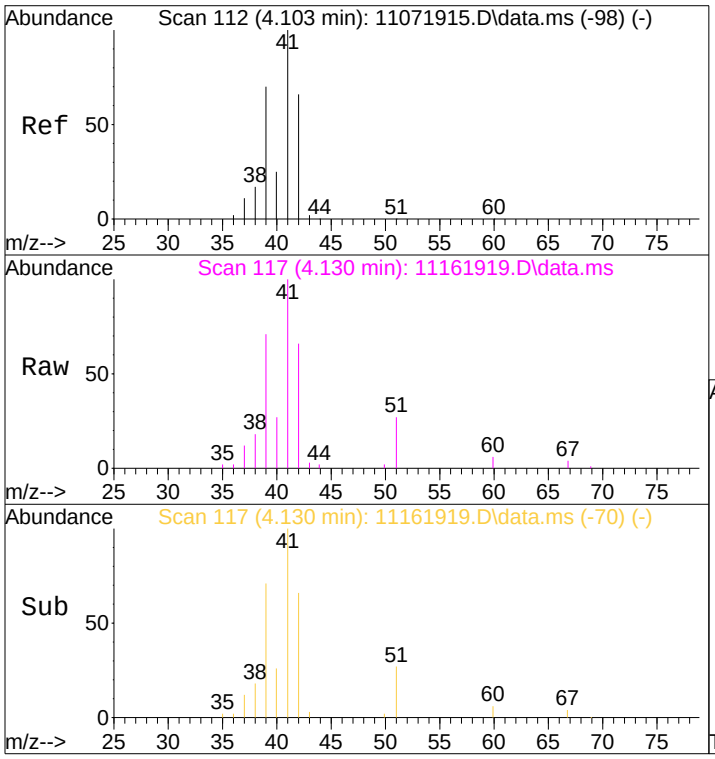
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161919.D
Acq On : 16 Nov 2019 13:38 Operator: WA
Sample : P1906559-003 (1000mL)
Misc : S31-10161904 pf2
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Nov 20 15:05:55 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

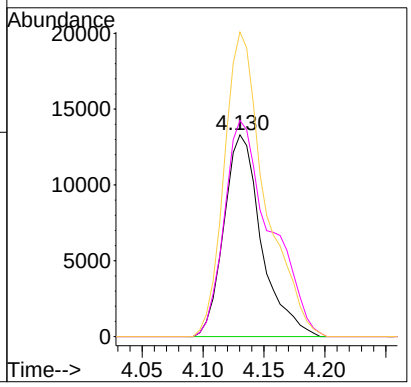


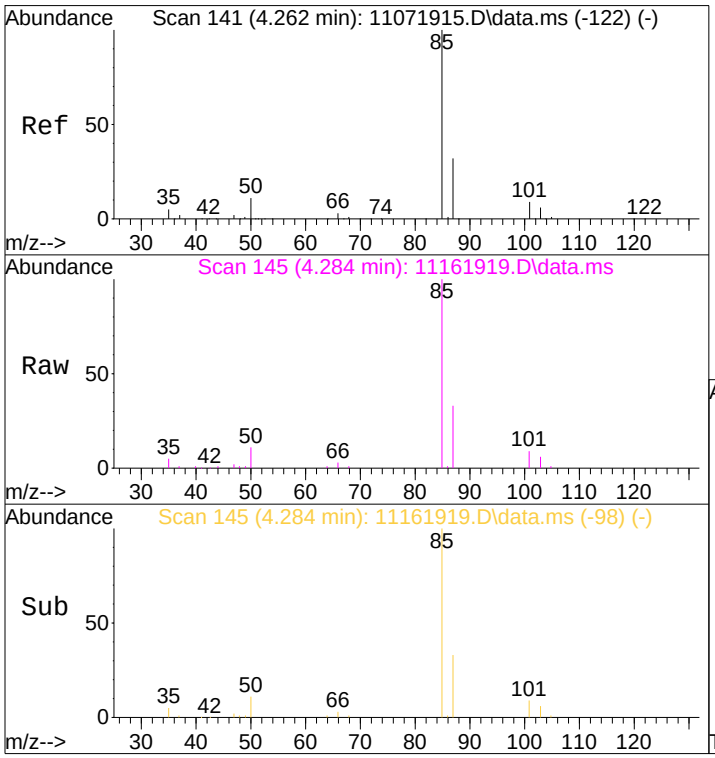


#2
Propene
Concen: 0.71 ng
RT: 4.13 min Scan# 117
Delta R.T. 0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 42 Resp: 28501

Ion	Ratio	Lower	Upper
42	100		
39	131.9	87.0	127.0#
41	164.8	132.2	172.2

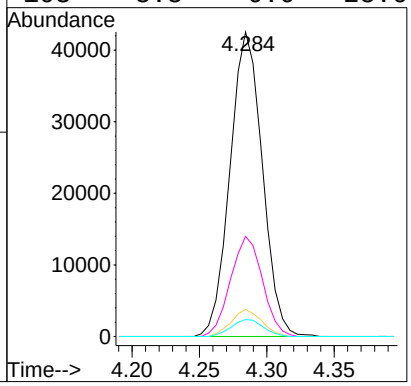


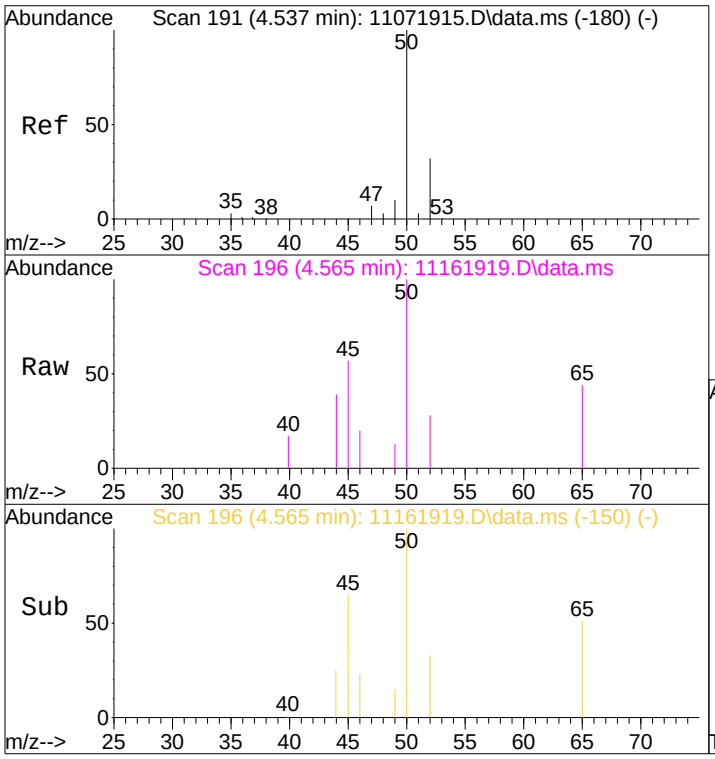


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.43 ng
RT: 4.28 min Scan# 145
Delta R.T. 0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 85 Resp: 70945

Ion	Ratio	Lower	Upper
85	100		
87	32.4	12.3	52.3
101	8.4	0.0	28.6
103	5.5	0.0	25.6

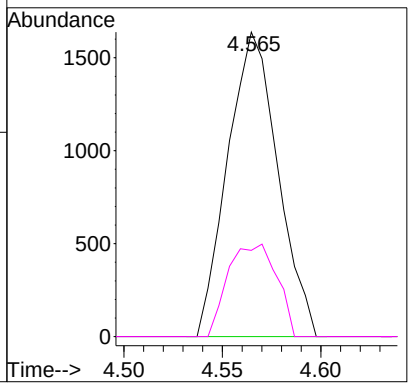


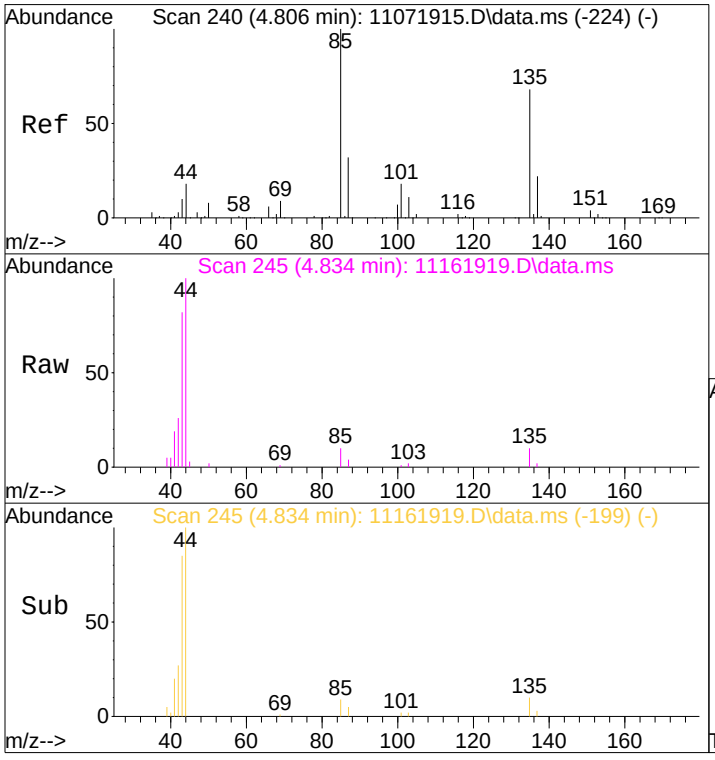


#4
Chloromethane
Concen: 0.08 ng
RT: 4.56 min Scan# 196
Delta R.T. 0.006 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 50 Resp: 2901

Ion	Ratio	Lower	Upper
50	100		
52	29.5	12.2	52.2

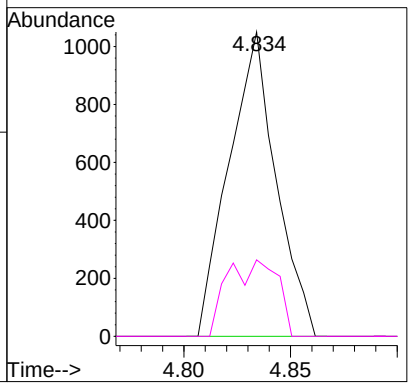


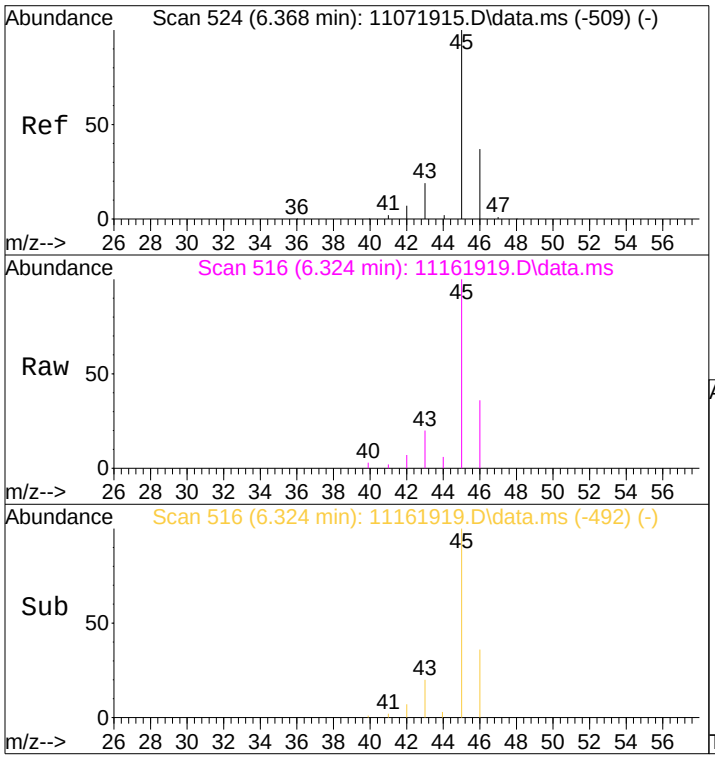


#5
1,2-Dichloro-1,1,2,2-tetrafluoroethane
Concen: 0.07 ng
RT: 4.83 min Scan# 245
Delta R.T. 0.005 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion:135 Resp: 1610

Ion	Ratio	Lower	Upper
135	100		
137	26.9	12.0	52.0

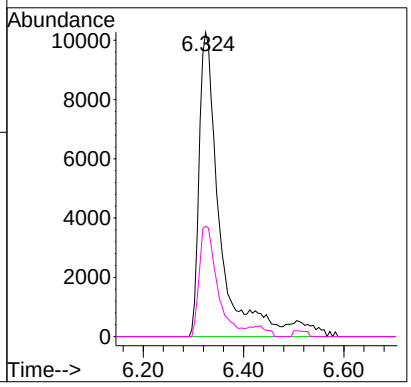


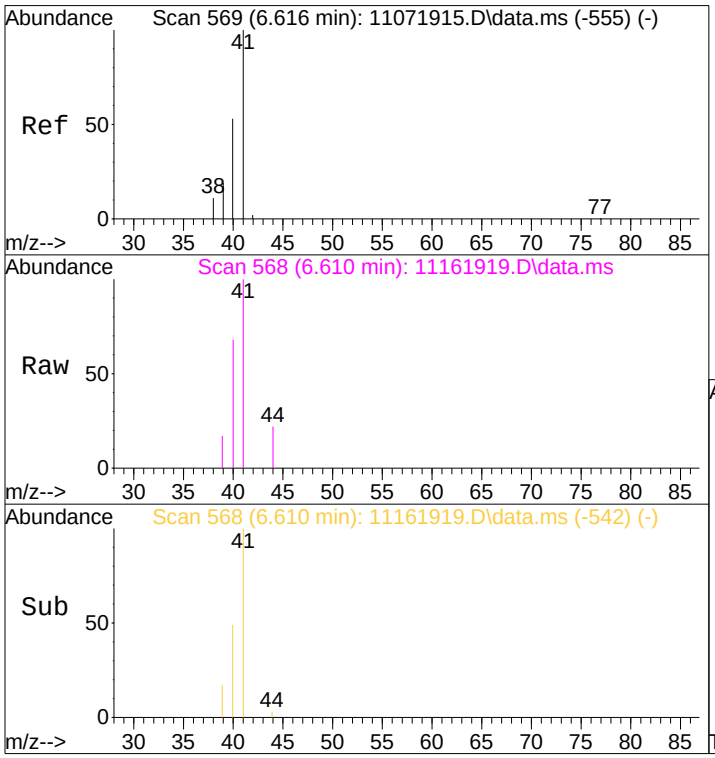


#10
Ethanol
Concen: 1.31 ng
RT: 6.32 min Scan# 516
Delta R.T. -0.115 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 45 Resp: 30257

Ion	Ratio	Lower	Upper
45	100		
46	34.0	17.3	57.3

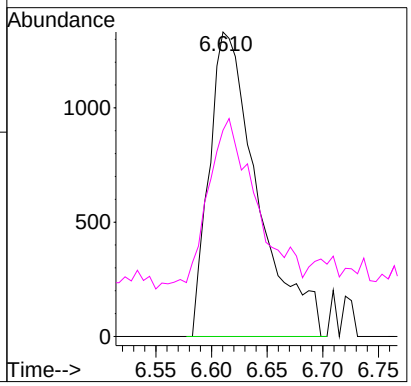


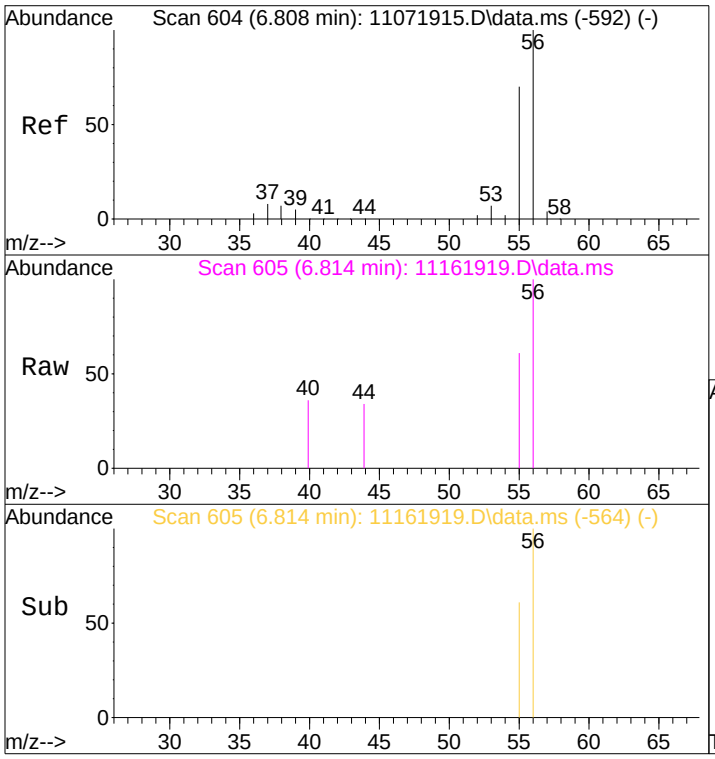


#11
Acetonitrile
Concen: 0.07 ng
RT: 6.61 min Scan# 568
Delta R.T. -0.055 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 41 Resp: 4029

Ion	Ratio	Lower	Upper
41	100		
40	59.6	32.8	72.8

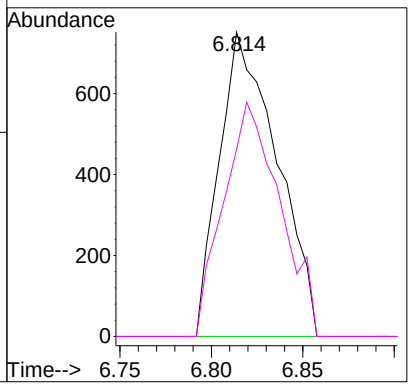


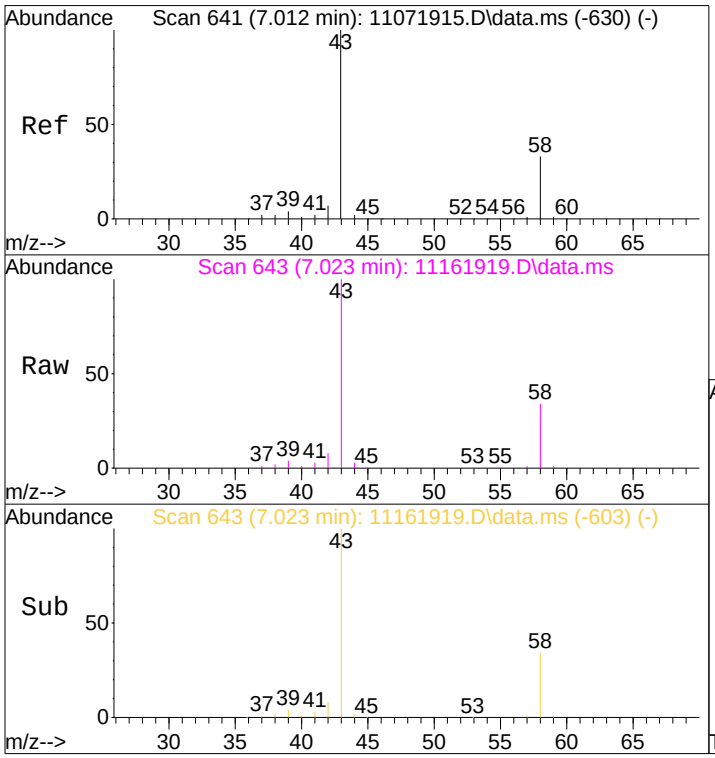


#12
Acrolein
Concen: 0.09 ng
RT: 6.81 min Scan# 605
Delta R.T. -0.022 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 56 Resp: 1650

Ion	Ratio	Lower	Upper
56	100		
55	75.4	49.7	89.7

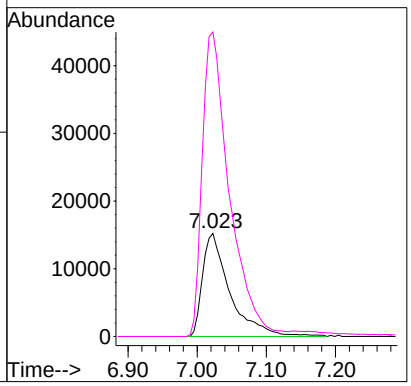


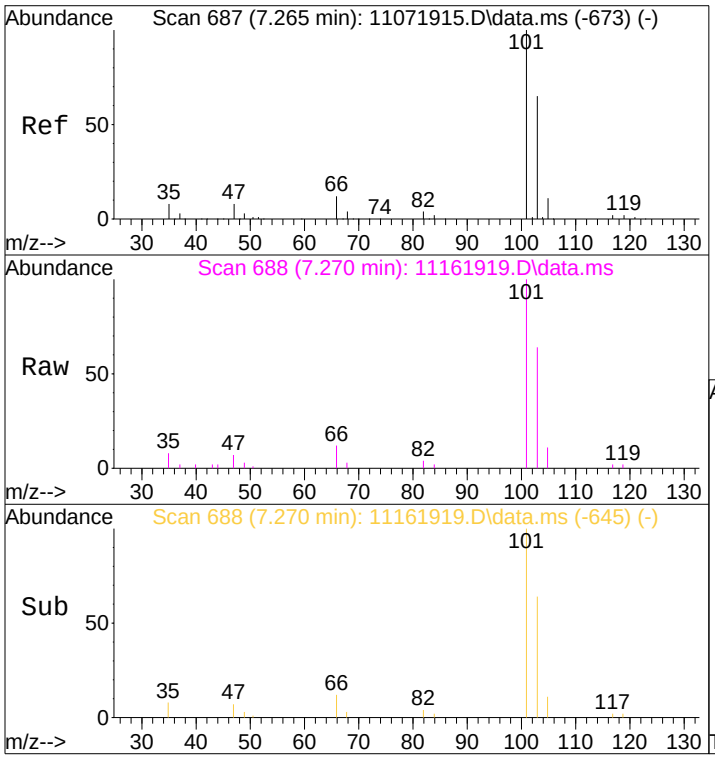


#13
Acetone
Concen: 1.96 ng
RT: 7.02 min Scan# 643
Delta R.T. -0.028 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 58 Resp: 42005

Ion	Ratio	Lower	Upper
58	100		
43	301.4	276.0	336.0

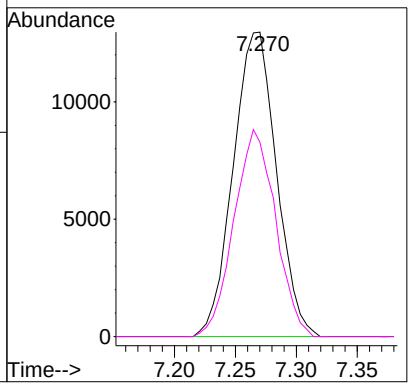


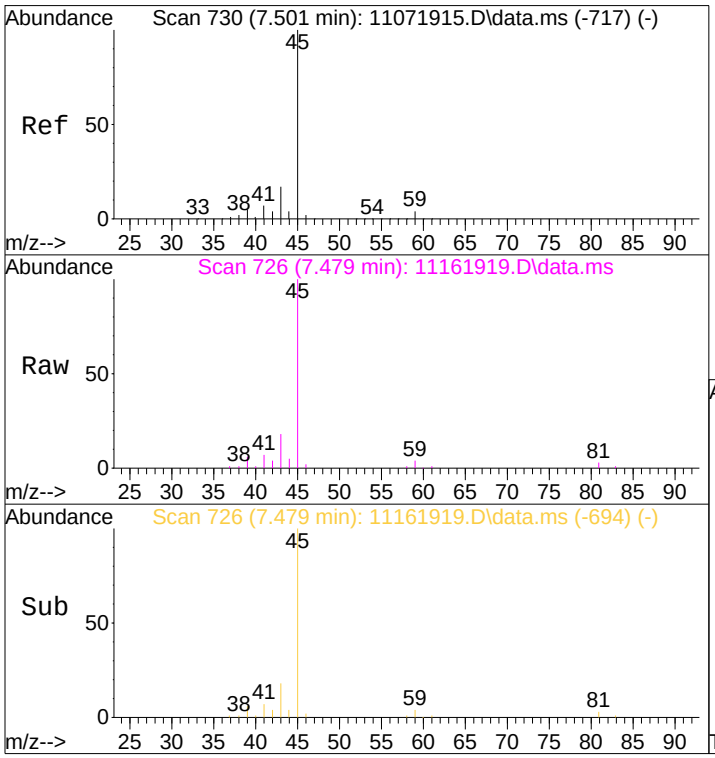


#14
Trichlorofluoromethane
Concen: 0.75 ng
RT: 7.27 min Scan# 688
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion:101 Resp: 31995

Ion	Ratio	Lower	Upper
101	100		
103	65.4	44.8	84.8

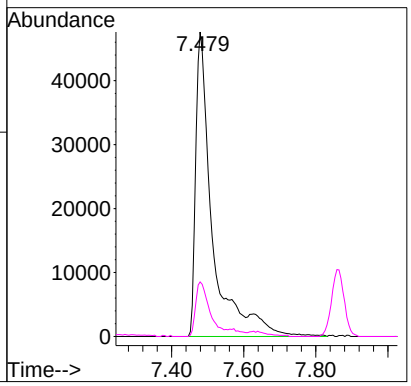


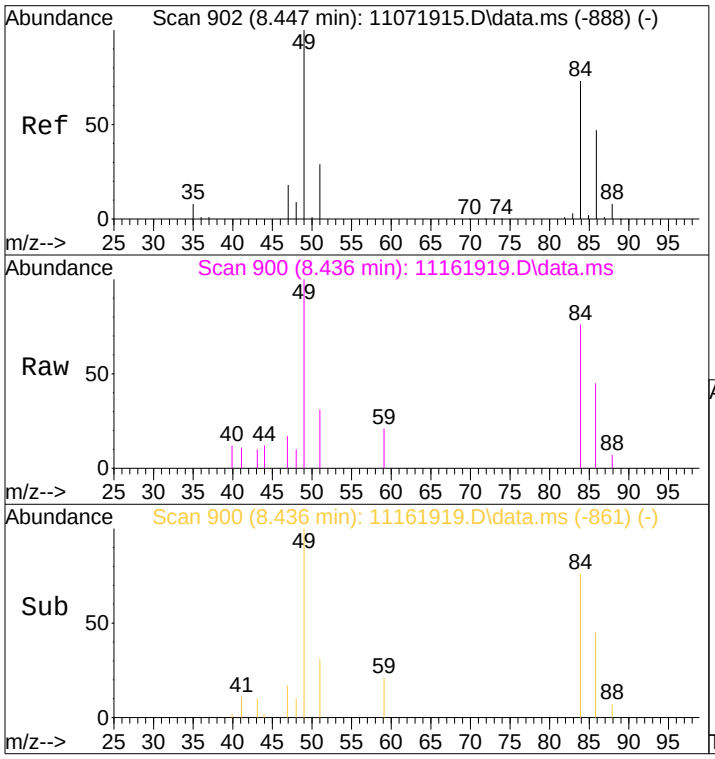


#15
2-Propanol (Isopropanol)
Concen: 2.52 ng
RT: 7.48 min Scan# 726
Delta R.T. -0.071 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 45 Resp: 154365

Ion	Ratio	Lower	Upper
45	100		
43	18.9	0.0	37.3

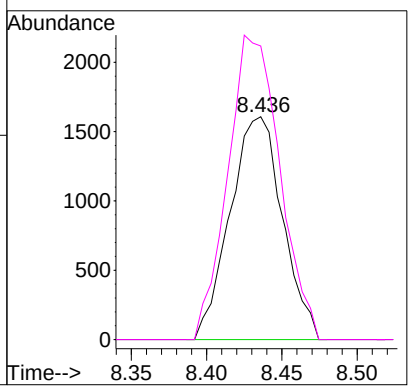


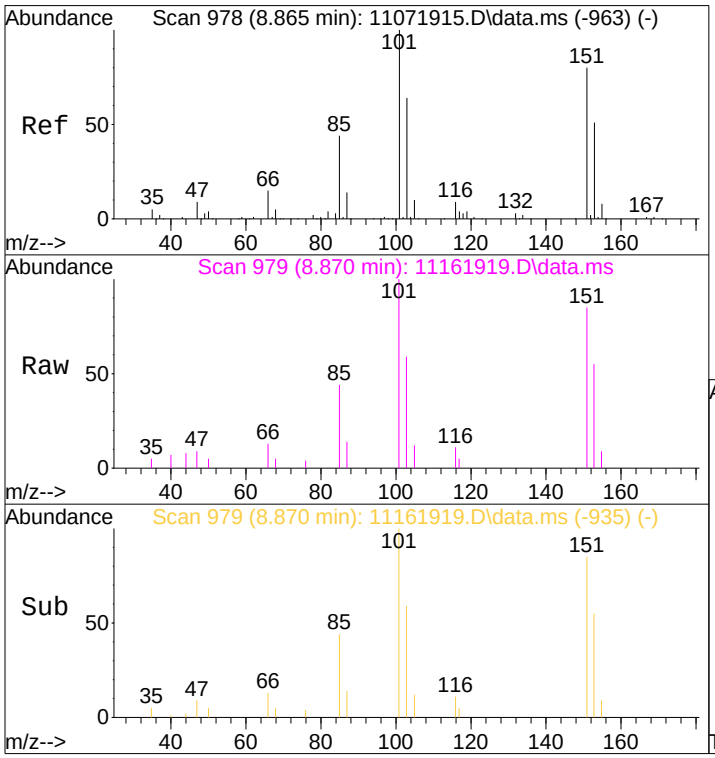


#19
Methylene Chloride
Concen: 0.15 ng
RT: 8.44 min Scan# 900
Delta R.T. -0.033 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 84 Resp: 3897

Ion	Ratio	Lower	Upper
84	100		
49	135.5	113.7	163.7

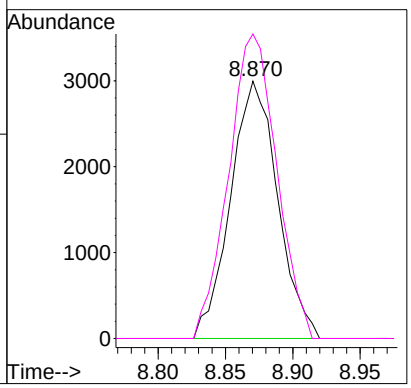


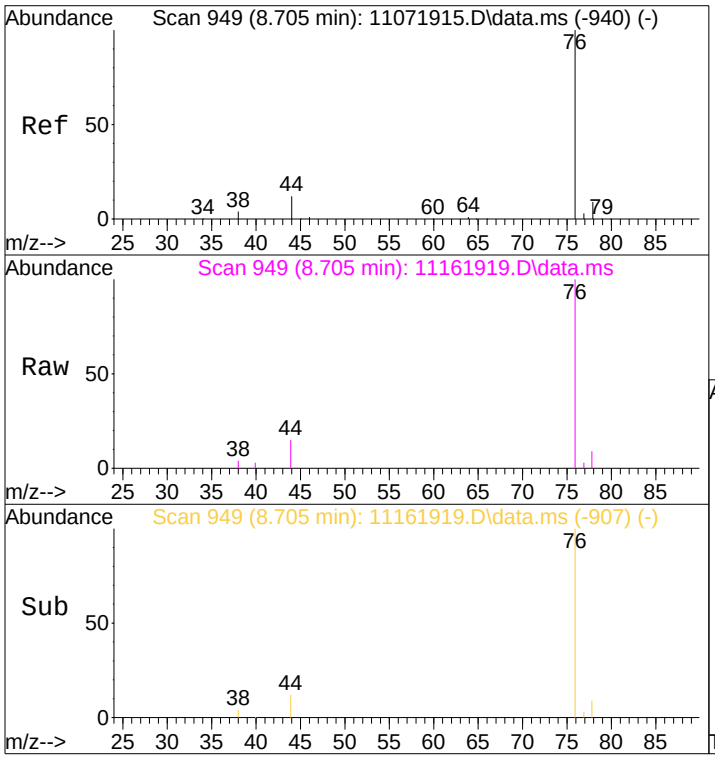


#21
Trichlorotrifluoroethane
Concen: 0.34 ng
RT: 8.87 min Scan# 979
Delta R.T. -0.005 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion:151 Resp: 7301

Ion	Ratio	Lower	Upper
151	100		
101	120.7	104.6	144.6

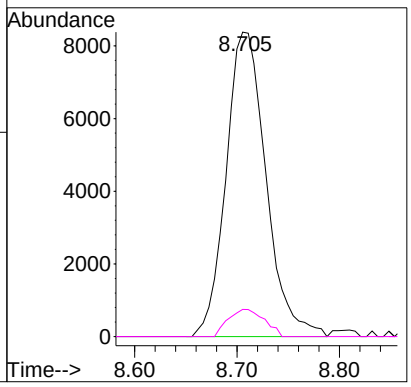


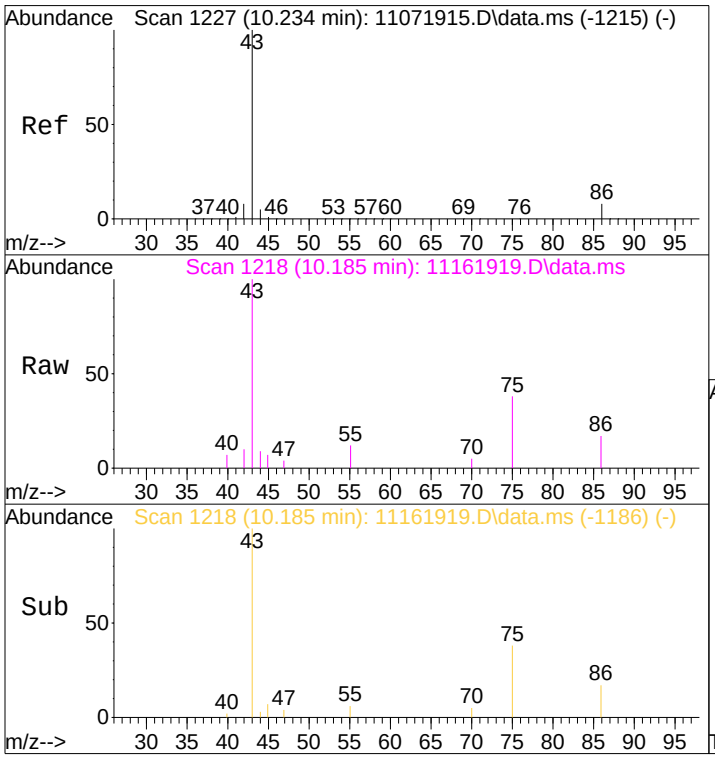


#22
Carbon Disulfide
Concen: 0.24 ng
RT: 8.71 min Scan# 949
Delta R.T. -0.017 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 76 Resp: 22730

Ion	Ratio	Lower	Upper
76	100		
78	8.1	0.0	29.1

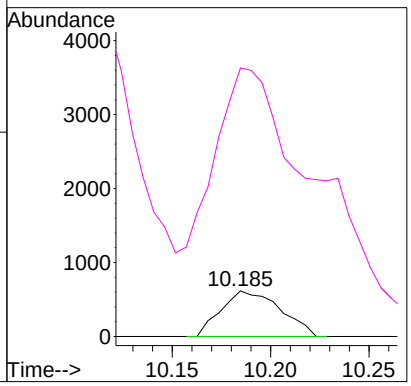


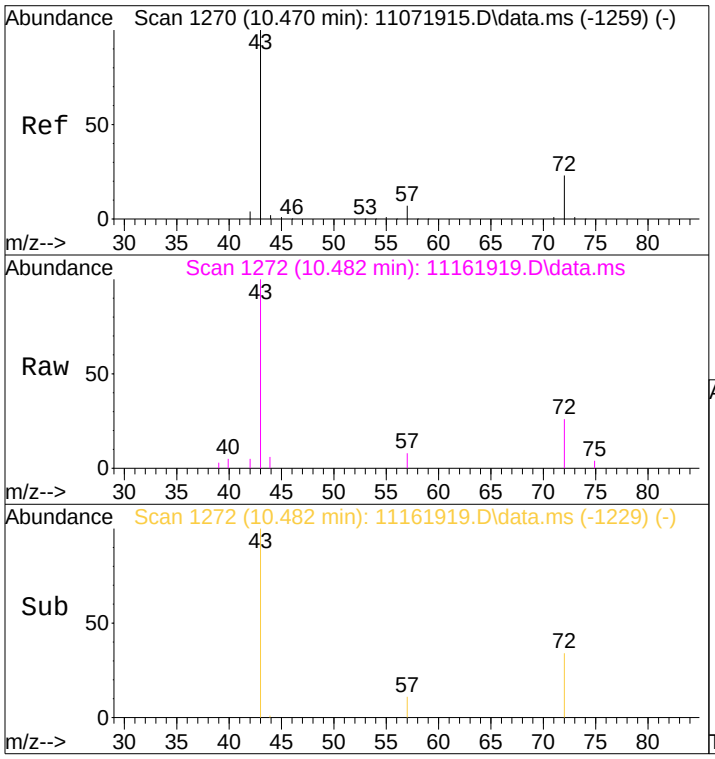


#26
Vinyl Acetate
Concen: 0.32 ng
RT: 10.18 min Scan# 1218
Delta R.T. -0.072 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 86 Resp: 1286

Ion	Ratio	Lower	Upper
86	100		
43	1131.1	1242.5	1282.5#

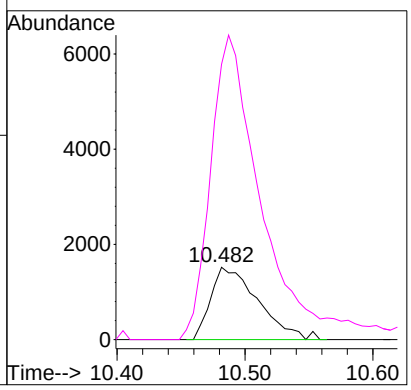


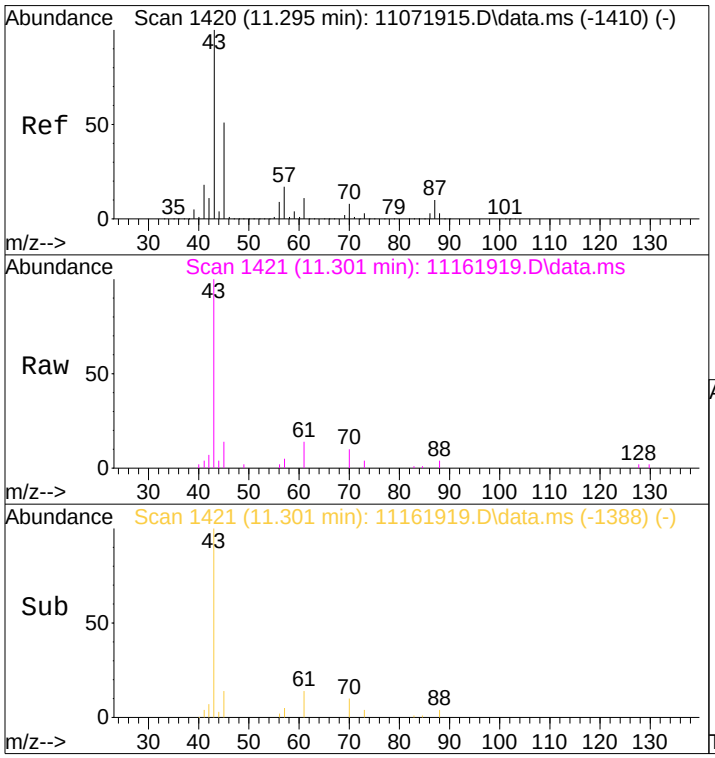


#27
2-Butanone (MEK)
Concen: 0.23 ng
RT: 10.48 min Scan# 1272
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 72 Resp: 3901

Ion	Ratio	Lower	Upper
72	100		
43	457.4	419.6	459.6

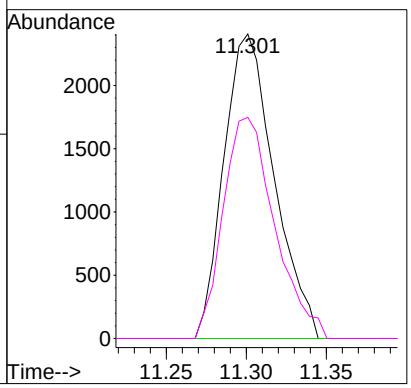


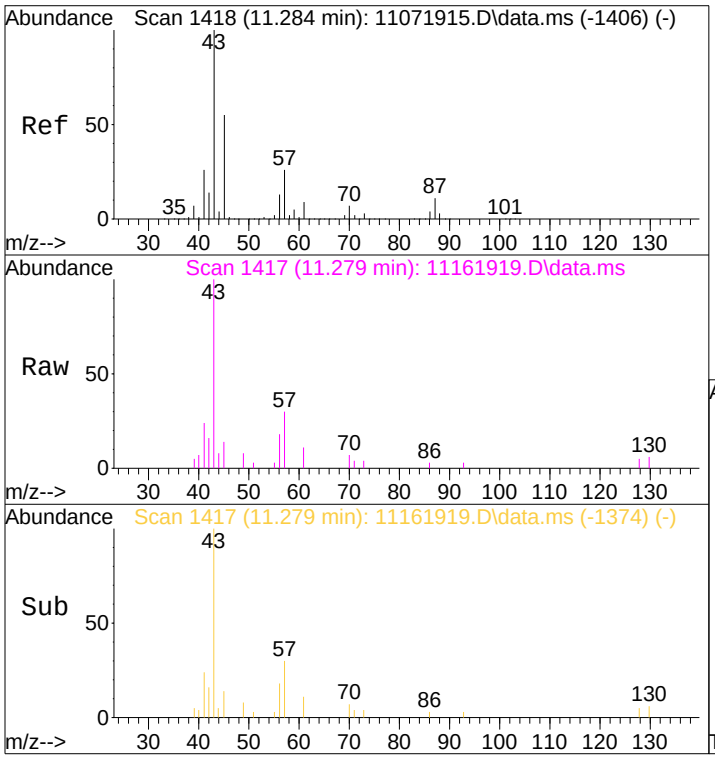


#30
Ethyl Acetate
Concen: 0.58 ng
RT: 11.30 min Scan# 1421
Delta R.T. -0.017 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 61 Resp: 5271

Ion	Ratio	Lower	Upper
61	100		
70	74.4	54.8	94.8

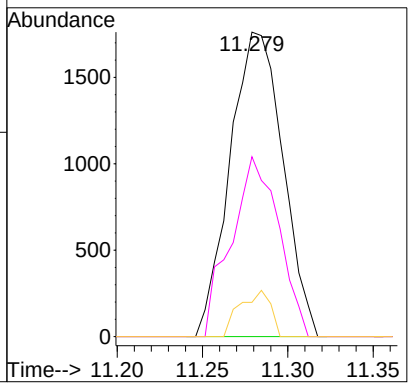


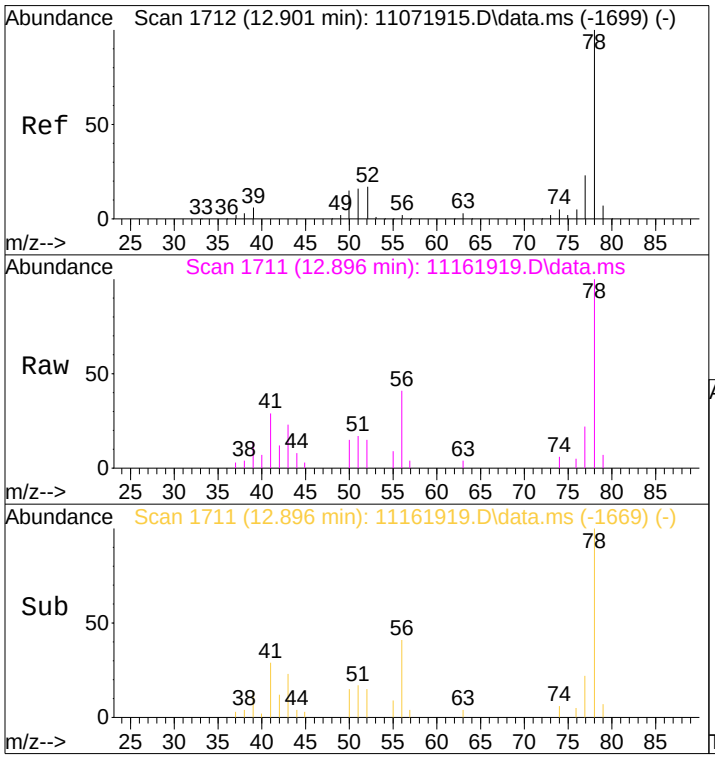


#31
n-Hexane
Concen: 0.09 ng
RT: 11.28 min Scan# 1417
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 57 Resp: 3789

Ion	Ratio	Lower	Upper
57	100		
56	53.2	40.7	61.1
86	8.8	12.0	18.0#

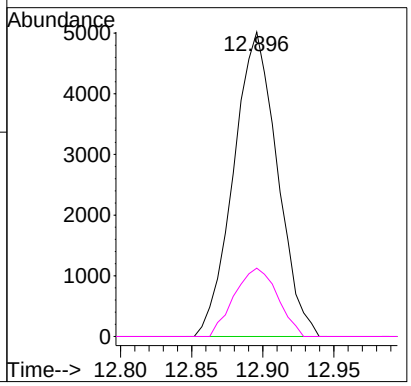


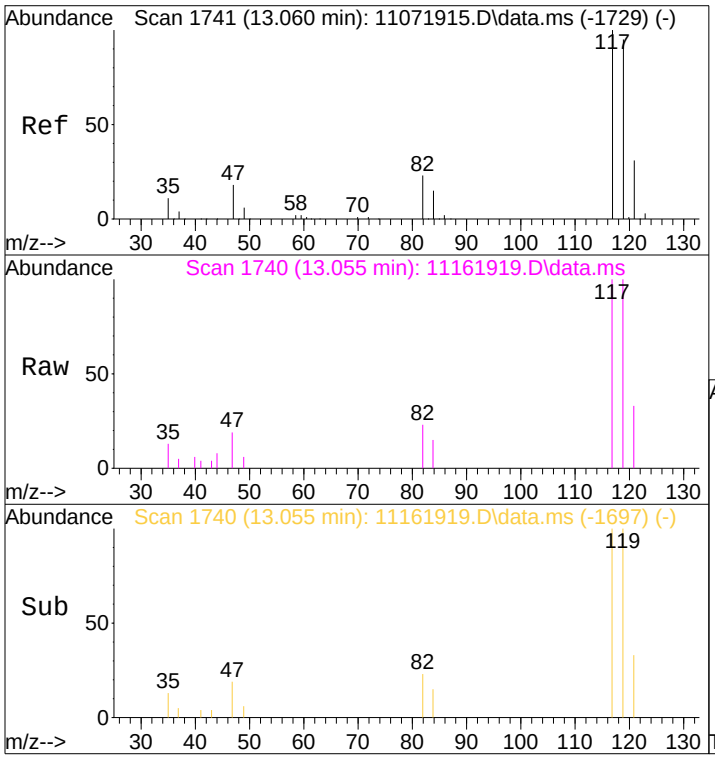


#41
Benzene
Concen: 0.11 ng
RT: 12.90 min Scan# 1711
Delta R.T. -0.017 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 78 Resp: 10757

Ion	Ratio	Lower	Upper
78	100		
77	22.1	3.2	43.2

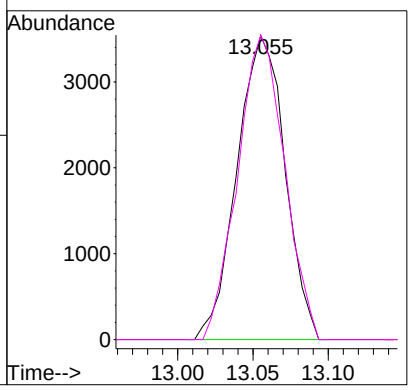


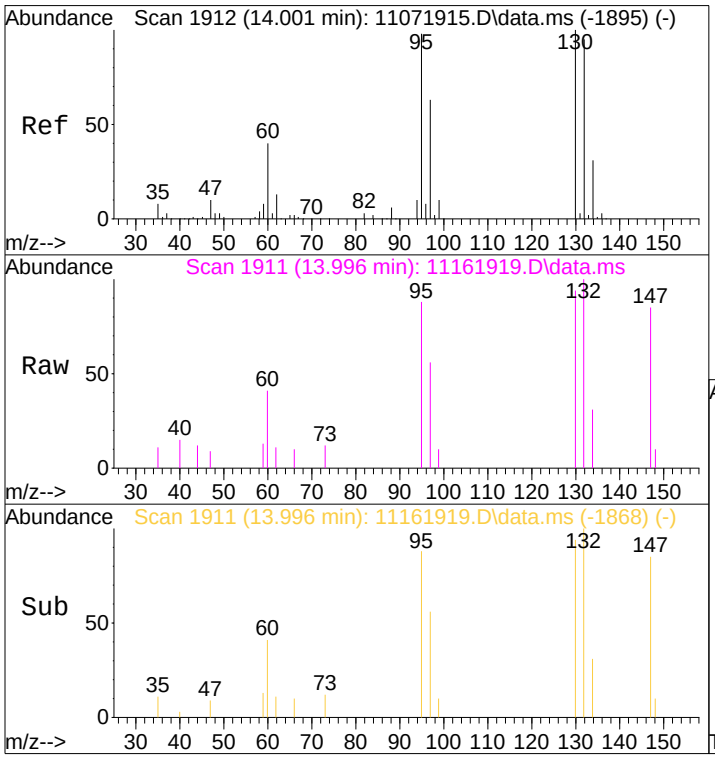


#42
Carbon Tetrachloride
Concen: 0.27 ng
RT: 13.06 min Scan# 1740
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion:117 Resp: 7846

Ion	Ratio	Lower	Upper
117	100		
119	98.1	75.8	115.8

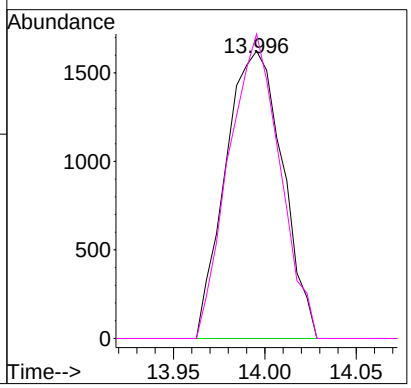


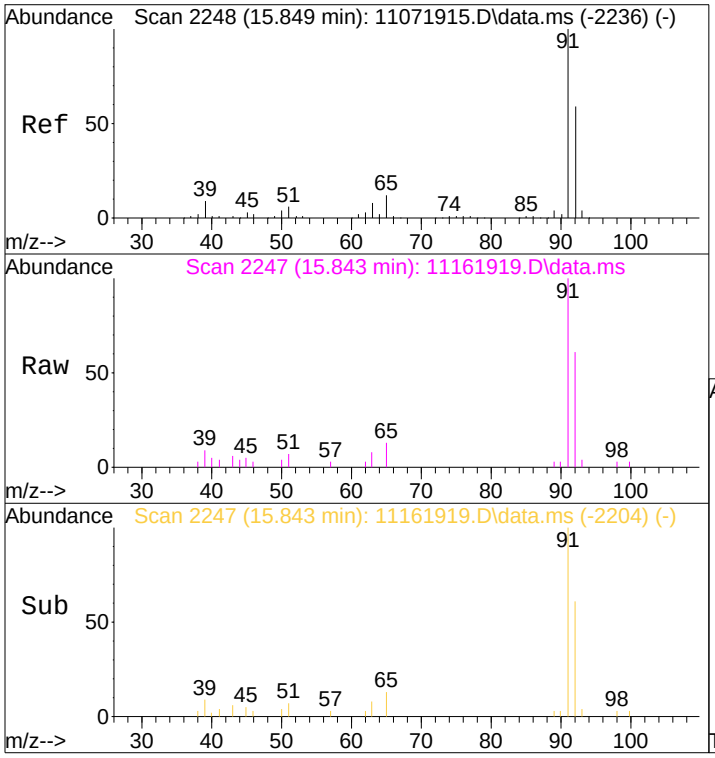


#47
Trichloroethene
Concen: 0.14 ng
RT: 14.00 min Scan# 1911
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion:130 Resp: 3518

Ion	Ratio	Lower	Upper
130	100		
132	95.1	75.1	115.1

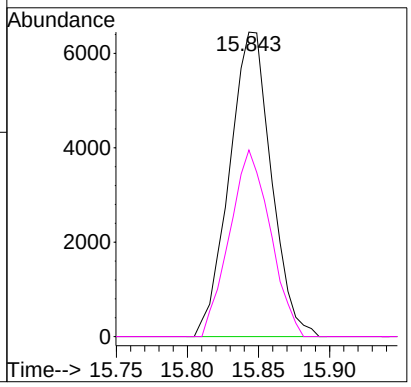


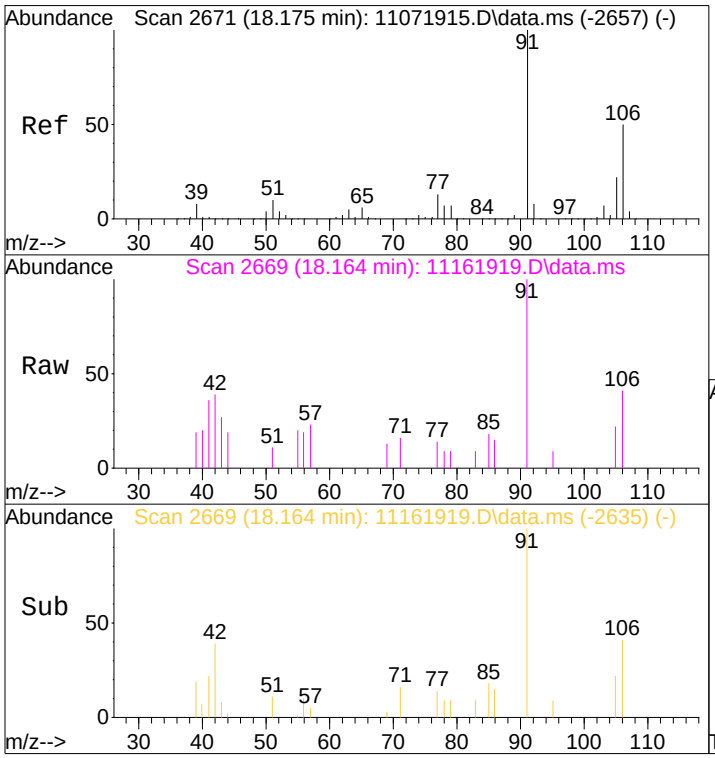


#58
Toluene
Concen: 0.16 ng
RT: 15.84 min Scan# 2247
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 91 Resp: 13241

Ion	Ratio	Lower	Upper
91	100		
92	59.4	39.4	79.4

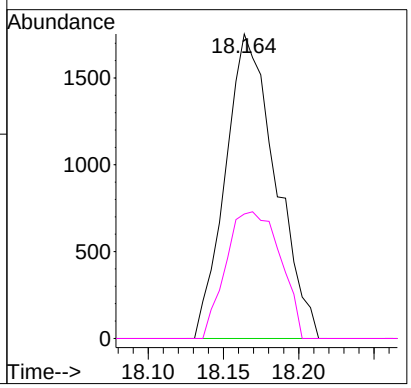


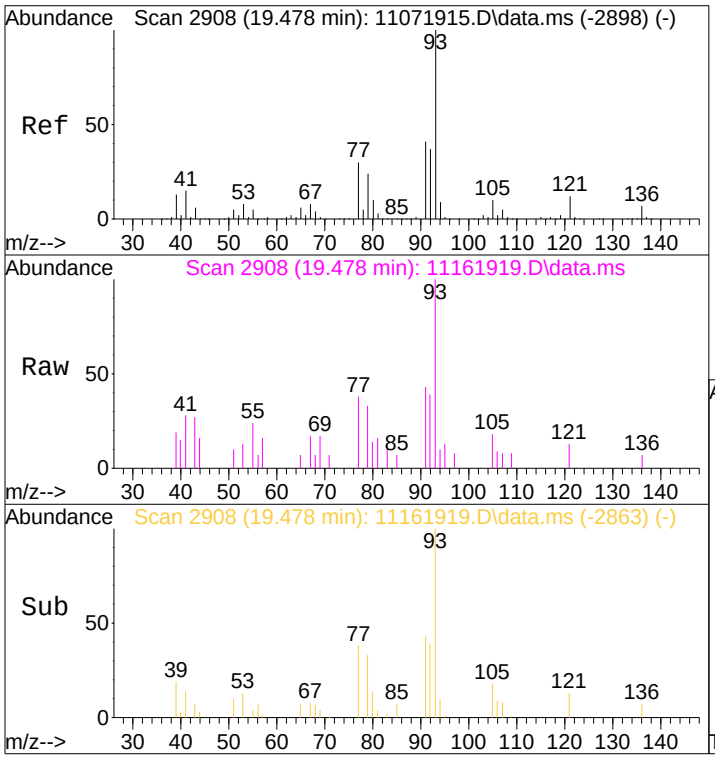


#67
m- & p-Xylenes
Concen: 0.05 ng
RT: 18.16 min Scan# 2669
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 91 Resp: 4064

Ion	Ratio	Lower	Upper
91	100		
106	45.0	29.0	69.0

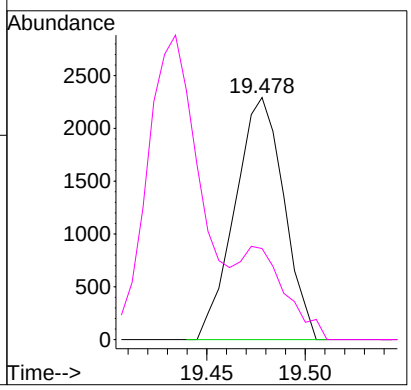


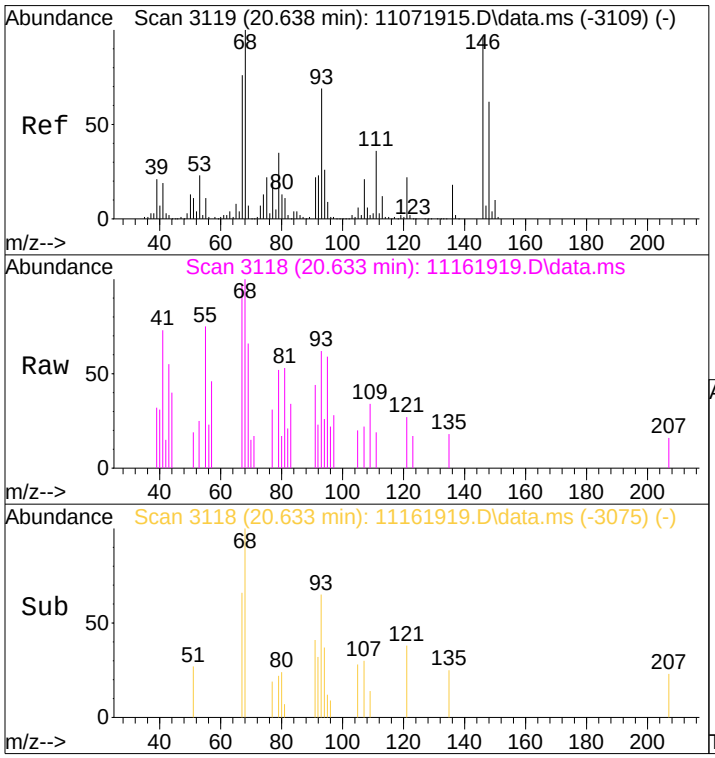


#75
alpha-Pinene
Concen: 0.08 ng
RT: 19.48 min Scan# 2908
Delta R.T. 0.000 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 93 Resp: 3964

Ion	Ratio	Lower	Upper
93	100		
77	136.0	10.7	50.7#

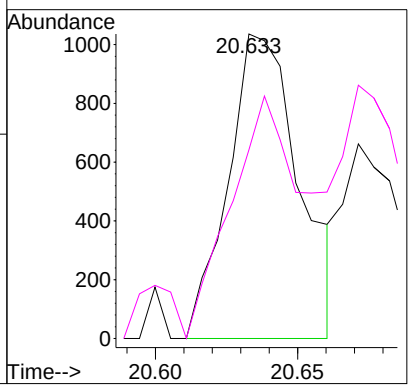




#91
d-Limonene
Concen: 0.06 ng
RT: 20.63 min Scan# 3118
Delta R.T. -0.011 min
Lab File: 11161919.D
Acq: 16 Nov 2019 13:38

Tgt Ion: 68 Resp: 1799

Ion	Ratio	Lower	Upper
68	100		
93	75.9	49.1	89.1



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161903.D Vial: 2
Acq On : 16 Nov 2019 1:55 Operator: LH
Sample : MB R16111619_1000mL Inst : GCMS-16
Misc : S31-10161904/SC01319

Quant Time: Nov 16 07:27:13 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019 11/16/19
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	235422	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	936407	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	431546	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	371027	12.315	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.48%				
57) Toluene-d8 (SS2)	15.74	98	944354	12.505	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.08%				
73) Bromofluorobenzene (SS3)	19.01	174	358975	13.307	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 106.48%				
Target Compounds							Qvalue
2) Propene	4.17	42	528	N.D.			
3) Dichlorodifluoromethan...	0.00	85	0	N.D.			
4) Chloromethane	0.00	50	0	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.			
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.36	45	7234	0.318	ng		88
11) Acetonitrile	6.64	41	1770	N.D.			
12) Acrolein	6.84	56	58	N.D.			
13) Acetone	7.07	58	3863	0.183	ng		85
14) Trichlorofluoromethane	0.00	101	0	N.D.			
15) 2-Propanol (Isopropanol)	7.58	45	847	N.D.			
16) Acrylonitrile	7.80	53	282	N.D.			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.			
19) Methylene Chloride	0.00	84	0	N.D.			
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.			
21) Trichlorotrifluoroethane	0.00	151	0	N.D.			
22) Carbon Disulfide	8.73	76	308	N.D.			
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D.			
27) 2-Butanone (MEK)	0.00	72	0	N.D.			
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	0.00	61	0	N.D.			
31) n-Hexane	0.00	57	0	N.D.			
32) Chloroform	0.00	83	0	N.D.			
34) Tetrahydrofuran (THF)	0.00	72	0	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	0.00	62	0	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	12.92	56	1171	0.056	ng	#	73
41) Benzene	12.90	78	1610	N.D.			
42) Carbon Tetrachloride	0.00	117	0	N.D.			
43) Cyclohexane	13.29	84	476	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.			
47) Trichloroethene	0.00	130	0	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.			
50) Methyl Methacrylate	0.00	100	0	N.D.			

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161903.D Vial: 2
Acq On : 16 Nov 2019 1:55 Operator: LH
Sample : MB R16111619_1000mL Inst : GCMS-16
Misc : S31-10161904/SC01319

Quant Time: Nov 16 07:27:13 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

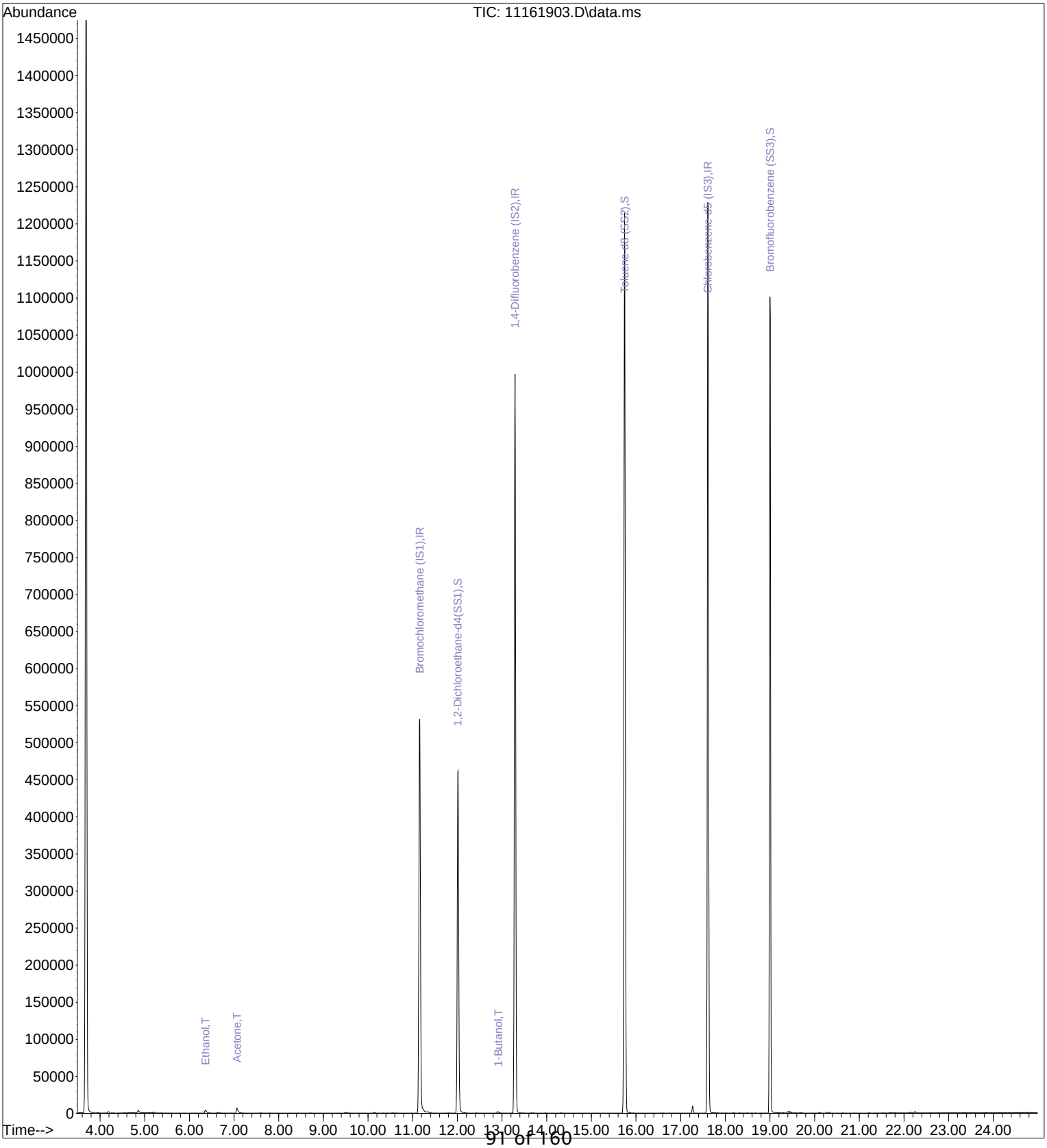
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.85	91	1002	N.D.		
59) 2-Hexanone	0.00	43	0	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.77	43	108	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.66	112	183	N.D.		
66) Ethylbenzene	18.02	91	282	N.D.		
67) m- & p-Xylenes	18.19	91	879	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.51	104	352	N.D.		
70) o-Xylene	18.61	91	123	N.D.		
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.14	105	188	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.58	91	482	N.D.		
77) 3-Ethyltoluene	19.68	105	612	N.D.		
78) 4-Ethyltoluene	19.71	105	617	N.D.		
79) 1,3,5-Trimethylbenzene	19.71	105	617	N.D.		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	19.95	105	235	N.D.		
82) 1,2,4-Trimethylbenzene	20.14	105	257	N.D.		
83) n-Decane	20.42	57	105	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D.		
85) 1,3-Dichlorobenzene	20.27	146	537	N.D.		
86) 1,4-Dichlorobenzene	20.33	146	888	N.D.		
87) sec-Butylbenzene	20.14	105	196	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	20.63	146	385	N.D.		
91) d-Limonene	0.00	68	0	N.D.		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D.		
94) 1,2,4-Trichlorobenzene	22.15	180	648	N.D.		
95) Naphthalene	22.25	128	2902	N.D.		
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.33	55	171	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D.		
100) n-Butylbenzene	20.88	91	262	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161903.D Vial: 2
Acq On : 16 Nov 2019 1:55 Operator: LH
Sample : MB R16111619_1000mL Inst : GCMS-16
Misc : S31-10161904/SC01319

Quant Time: Nov 16 07:27:13 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161904.D Vial: 2
Acq On : 16 Nov 2019 2:28 Operator: LH
Sample : LCS R16111619_ 25ng Inst : GCMS-16
Misc : S31-10161904/S31-10241903 (11/22)

Quant Time: Nov 16 07:27:15 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS) 11/16/19
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	241943	12.500	ng		-0.01
37) 1,4-Difluorobenzene (IS2)	13.30	114	957392	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	462843	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.03	65	365636	11.809	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.48%				
57) Toluene-d8 (SS2)	15.75	98	1023207	12.633	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.04%				
73) Bromofluorobenzene (SS3)	19.01	174	370593	12.808	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 102.48%				
Target Compounds							Qvalue
2) Propene	4.10	42	919719	22.498	ng		99
3) Dichlorodifluoromethan...	4.26	85	1203699	23.964	ng		100
4) Chloromethane	4.54	50	591464	17.085	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	598608	24.037	ng		100
6) Vinyl Chloride	4.97	62	934676	23.578	ng		99
7) 1,3-Butadiene	5.23	54	812635	27.171	ng		99
8) Bromomethane	5.66	94	521641	21.871	ng		100
9) Chloroethane	6.00	64	441655	21.063	ng		99
10) Ethanol	6.36	45	2597408	111.201	ng		100
11) Acetonitrile	6.61	41	1345708	23.144	ng		100
12) Acrolein	6.80	56	433668	23.426	ng		100
13) Acetone	7.01	58	2471015	113.691	ng		99
14) Trichlorofluoromethane	7.26	101	1029529	23.978	ng		100
15) 2-Propanol (Isopropanol)	7.50	45	3068353	49.434	ng		100
16) Acrylonitrile	7.77	53	961999	24.625	ng		100
17) 1,1-Dichloroethene	8.22	96	590297	24.138	ng		98
18) 2-Methyl-2-Propanol (t...	8.37	59	2862372	64.233	ng		98
19) Methylene Chloride	8.45	84	597217	22.228	ng		97
20) 3-Chloro-1-propene (Al...	8.61	41	994307	22.841	ng		99
21) Trichlorotrifluoroethane	8.87	151	525597	23.850	ng		98
22) Carbon Disulfide	8.71	76	2245604	23.570	ng		100
23) trans-1,2-Dichloroethene	9.72	61	904399	23.745	ng		98
24) 1,1-Dichloroethane	9.98	63	1081294	22.112	ng		100
25) Methyl tert-Butyl Ether	10.07	73	1623001	29.602	ng		99
26) Vinyl Acetate	10.23	86	673093	166.661	ng	#	91
27) 2-Butanone (MEK)	10.47	72	435348	25.159	ng		92
28) cis-1,2-Dichloroethene	10.99	61	895866	23.694	ng		97
29) Diisopropyl Ether	11.29	87	572782	25.488	ng	#	88
30) Ethyl Acetate	11.30	61	464214	50.785	ng		99
31) n-Hexane	11.28	57	1006644	22.915	ng		99
32) Chloroform	11.34	83	989736	23.228	ng		100
34) Tetrahydrofuran (THF)	11.74	72	450310	25.096	ng		92
35) Ethyl tert-Butyl Ether	11.88	87	606273	29.033	ng		94
36) 1,2-Dichloroethane	12.14	62	791974	23.885	ng		100
38) 1,1,1-Trichloroethane	12.42	97	932727	26.924	ng		99
39) Isopropyl Acetate	12.85	61	881208	54.003	ng		99
40) 1-Butanol	12.86	56	1265676	59.706	ng		100
41) Benzene	12.90	78	2214828	22.856	ng		100
42) Carbon Tetrachloride	13.06	117	779497	27.667	ng		99
43) Cyclohexane	13.19	84	1791684	49.752	ng		97
44) tert-Amyl Methyl Ether	13.54	73	1486922	29.605	ng		99
45) 1,2-Dichloropropane	13.75	63	649580	24.585	ng		100
46) Bromodichloromethane	13.95	83	831652	26.812	ng		100
47) Trichloroethene	14.00	130	593922	25.100	ng		100
48) 1,4-Dioxane	13.96	88	494489	27.058	ng		96
49) 2,2,4-Trimethylpentane...	14.07	57	2465593	23.063	ng		98
50) Methyl Methacrylate	14.20	100	498542	55.262	ng		98

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161904.D Vial: 2
Acq On : 16 Nov 2019 2:28 Operator: LH
Sample : LCS R16111619_ 25ng Inst : GCMS-16
Misc : S31-10161904/S31-10241903 (11/22)

Quant Time: Nov 16 07:27:15 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

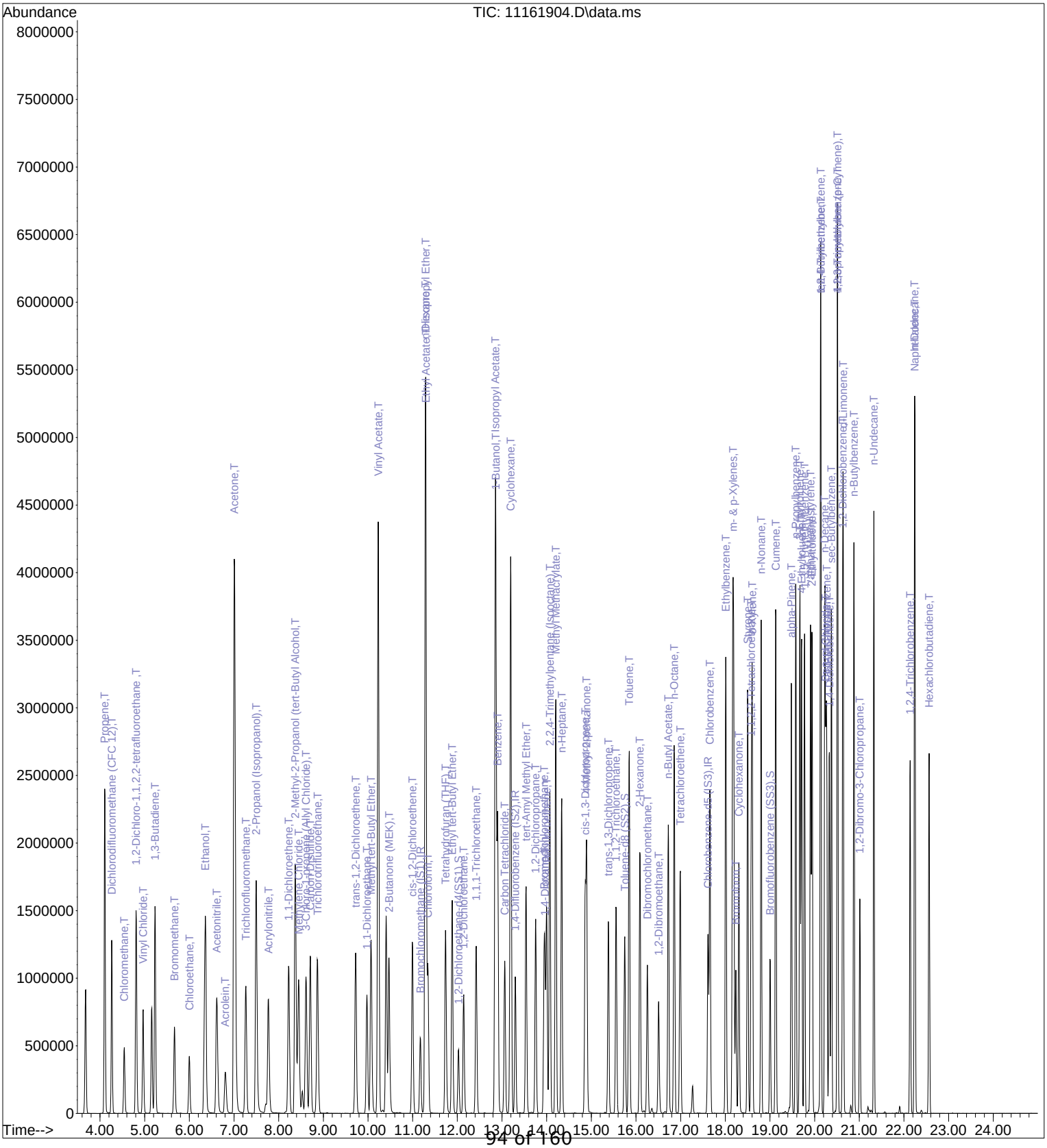
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	602850	24.823	ng	99
52) cis-1,3-Dichloropropene	14.86	75	1079091	29.106	ng	100
53) 4-Methyl-2-pentanone	14.89	58	594596	25.957	ng	98
54) trans-1,3-Dichloropropene	15.38	75	918460	28.962	ng	100
55) 1,1,2-Trichloroethane	15.55	97	588871	25.740	ng	99
58) Toluene	15.85	91	2338245	27.374	ng	100
59) 2-Hexanone	16.09	43	1586162	28.170	ng	98
60) Dibromochloromethane	16.26	129	715210	29.800	ng	100
61) 1,2-Dibromoethane	16.51	107	697376	28.354	ng	100
62) n-Butyl Acetate	16.72	43	1873171	29.174	ng	99
63) n-Octane	16.86	57	564165	25.861	ng	97
64) Tetrachloroethene	16.99	166	667437	26.144	ng	100
65) Chlorobenzene	17.65	112	1520422	25.311	ng	100
66) Ethylbenzene	18.01	91	2719676	26.168	ng	100
67) m- & p-Xylenes	18.17	91	3905886	50.214	ng	98
68) Bromoform	18.24	173	564612	31.501	ng	100
69) Styrene	18.50	104	1686615	27.990	ng	100
70) o-Xylene	18.60	91	1889091	25.629	ng	100
71) n-Nonane	18.80	43	1350975	25.617	ng	99
72) 1,1,2,2-Tetrachloroethane	18.58	83	1031504	26.236	ng	100
74) Cumene	19.13	105	2593963	26.769	ng	100
75) alpha-Pinene	19.48	93	1292927	27.002	ng	99
76) n-Propylbenzene	19.58	91	3142436	25.832	ng	100
77) 3-Ethyltoluene	19.67	105	2496246	26.483	ng	100
78) 4-Ethyltoluene	19.71	105	2246349	25.966	ng	100
79) 1,3,5-Trimethylbenzene	19.77	105	1991249	25.111	ng	99
80) alpha-Methylstyrene	19.91	118	1130238	28.483	ng	100
81) 2-Ethyltoluene	19.94	105	2293895	26.995	ng	99
82) 1,2,4-Trimethylbenzene	20.14	105	1971980	25.542	ng	100
83) n-Decane	20.23	57	1212350	24.982	ng	99
84) Benzyl Chloride	20.25	91	1621190	35.064	ng	99
85) 1,3-Dichlorobenzene	20.27	146	1140107	25.222	ng	100
86) 1,4-Dichlorobenzene	20.33	146	1183237	25.555	ng	99
87) sec-Butylbenzene	20.37	105	2561844	26.726	ng	100
88) 4-Isopropyltoluene (p-...	20.51	119	2356260	26.093	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	1911226	24.700	ng	99
90) 1,2-Dichlorobenzene	20.63	146	1152378	25.896	ng	100
91) d-Limonene	20.64	68	713572	24.534	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.01	157	474929	30.047	ng	97
93) n-Undecane	21.33	57	1358064	27.141	ng	99
94) 1,2,4-Trichlorobenzene	22.14	180	922096	28.292	ng	100
95) Naphthalene	22.24	128	2422651	25.597	ng	100
96) n-Dodecane	22.24	57	874427	21.947	ng	97
97) Hexachlorobutadiene	22.56	225	589402	26.205	ng	100
98) Cyclohexanone	18.30	55	859867	26.311	ng	98
99) tert-Butylbenzene	20.14	119	1886698	24.826	ng	100
100) n-Butylbenzene	20.88	91	2308654	26.068	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161904.D Vial: 2
Acq On : 16 Nov 2019 2:28 Operator: LH
Sample : LCS R16111619_ 25ng Inst : GCMS-16
Misc : S31-10161904/S31-10241903 (11/22)

Quant Time: Nov 16 07:27:15 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161917.D
Acq On : 16 Nov 2019 12:31 Operator: WA
Sample : P1906559-001dup (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 15:01:36 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/20/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	239703	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	998462	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	451638	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	355709	11.595	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.80%				
57) Toluene-d8 (SS2)	15.74	98	995179	12.592	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.72%				
73) Bromofluorobenzene (SS3)	19.00	174	384850	13.631	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.04%				
Target Compounds							Qvalue
2) Propene	4.10	42	67009	1.654	ng		97
3) Dichlorodifluoromethan...	4.27	85	78300	1.573	ng		100
4) Chloromethane	4.54	50	104	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1862	0.075	ng		92
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	5.22	54	672	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	6.32	45	551380	23.826	ng		99
11) Acetonitrile	6.60	41	3576	0.062	ng		87
12) Acrolein	6.80	56	2034	0.111	ng		96
13) Acetone	7.00	58	175512	8.151	ng	#	62
14) Trichlorofluoromethane	7.26	101	51027	1.200	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	291170	4.735	ng		100
16) Acrylonitrile	0.00	53	0	N.D. d			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D. d			
19) Methylene Chloride	8.43	84	1718	0.065	ng		86
20) 3-Chloro-1-propene (Al...	8.61	41	429	N.D.			
21) Trichlorotrifluoroethane	8.86	151	8911	0.408	ng		95
22) Carbon Disulfide	8.70	76	54294	0.575	ng		99
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	10.00	63	824	N.D.			
25) Methyl tert-Butyl Ether	10.10	73	163	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D. d			
27) 2-Butanone (MEK)	10.48	72	8086	0.472	ng		96
28) cis-1,2-Dichloroethene	10.99	61	263	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D. d			
30) Ethyl Acetate	11.30	61	5568	0.615	ng	#	40
31) n-Hexane	11.28	57	369626	8.493	ng		99
32) Chloroform	11.33	83	7368	0.175	ng		97
34) Tetrahydrofuran (THF)	11.78	72	254	N.D.			
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	12.15	62	922	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	12.89	61	341	N.D.			
40) 1-Butanol	0.00	56	0	N.D. d			
41) Benzene	12.90	78	71666	0.709	ng		100
42) Carbon Tetrachloride	13.06	117	4494	0.153	ng		100
43) Cyclohexane	13.19	84	366311	9.753	ng		99
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	13.89	63	180	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D. d			
47) Trichloroethene	14.00	130	710	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D. d			

Data File: I:\MS16\DATA\2019_11\16\11161917.D
Acq On : 16 Nov 2019 12:31 Operator: WA
Sample : P1906559-001dup (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 15:01:36 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

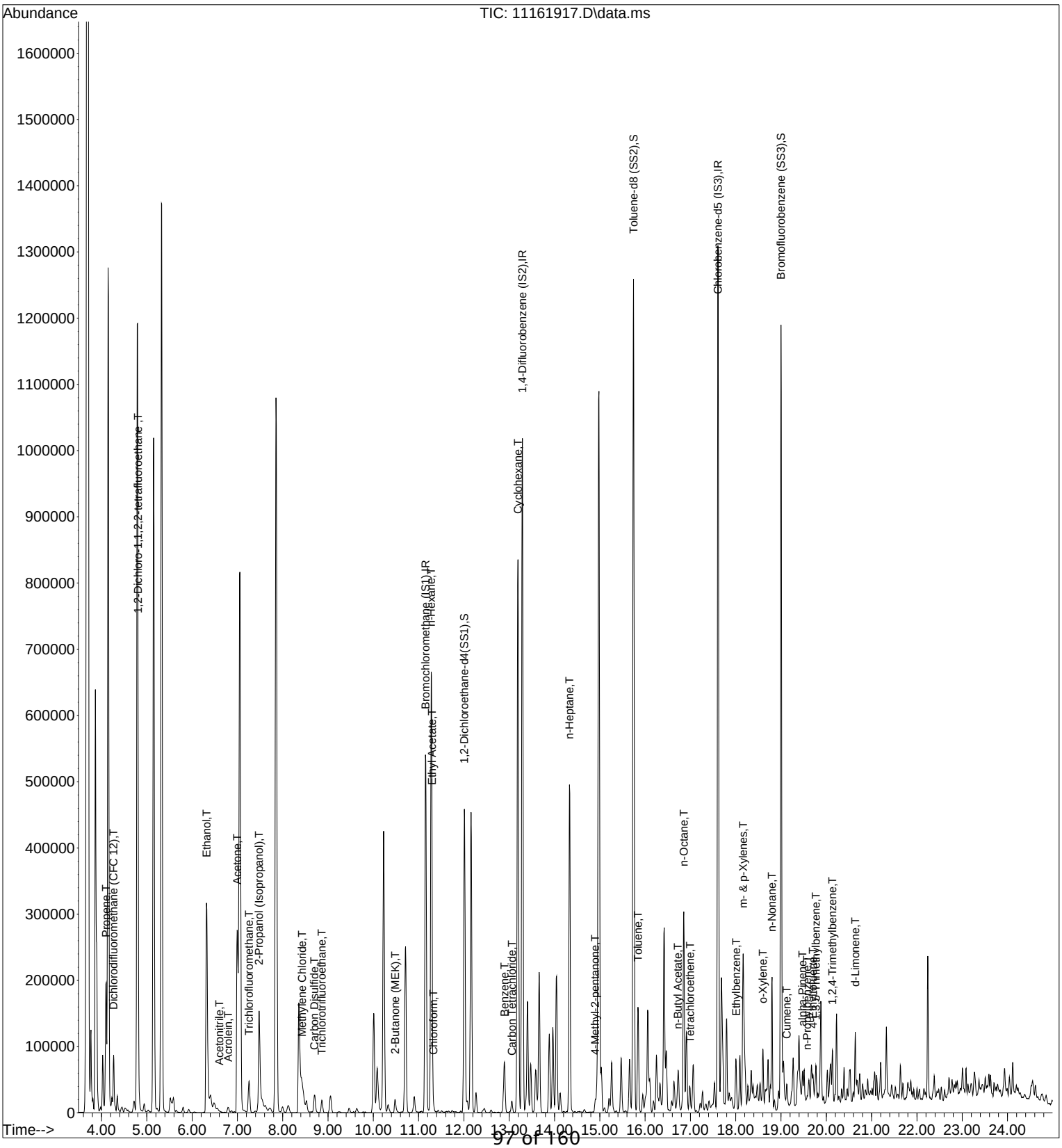
Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	14.20	100	243	N.D.		
51) n-Heptane	14.33	71	132177	5.219 ng		99
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	14.90	58	6813	0.285 ng		98
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D. d		
58) Toluene	15.84	91	134391	1.612 ng		100
59) 2-Hexanone	0.00	43	0	N.D. d		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.72	43	29896	0.477 ng	#	69
63) n-Octane	16.85	57	64365	3.024 ng		100
64) Tetrachloroethene	16.99	166	6602	0.265 ng		98
65) Chlorobenzene	0.00	112	0	N.D. d		
66) Ethylbenzene	18.01	91	46526	0.459 ng		99
67) m- & p-Xylenes	18.16	91	177075	2.333 ng		97
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.50	104	855	N.D.		
70) o-Xylene	18.60	91	50202	0.698 ng		99
71) n-Nonane	18.80	43	77158	1.499 ng		98
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D. d		
74) Cumene	19.13	105	7664	0.081 ng		100
75) alpha-Pinene	19.48	93	19269	0.412 ng		97
76) n-Propylbenzene	19.58	91	9054	0.076 ng		84
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	19.70	105	5155	0.061 ng		98
79) 1,3,5-Trimethylbenzene	19.77	105	17089	0.221 ng		99
80) alpha-Methylstyrene	19.91	118	525	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	20.13	105	23062	0.306 ng		90
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	20.25	91	1201	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	236	N.D.		
86) 1,4-Dichlorobenzene	20.33	146	236	N.D.		
87) sec-Butylbenzene	20.37	105	3536	N.D.		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D. d		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D. d		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	20.64	68	24909	0.878 ng		91
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	22.15	180	167	N.D.		
95) Naphthalene	22.25	128	2534	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	20.09	119	874	N.D.		
100) n-Butylbenzene	20.87	91	3050	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161917.D
Acq On : 16 Nov 2019 12:31 Operator: WA
Sample : P1906559-001dup (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 15:01:36 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161917.D
Acq On : 16 Nov 2019 12:31 Operator: WA
Sample : P1906559-001dup (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 15:01:36 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019 LH 11/20/19
Response via : Initial Calibration
DataAcq Meth:TO15.M

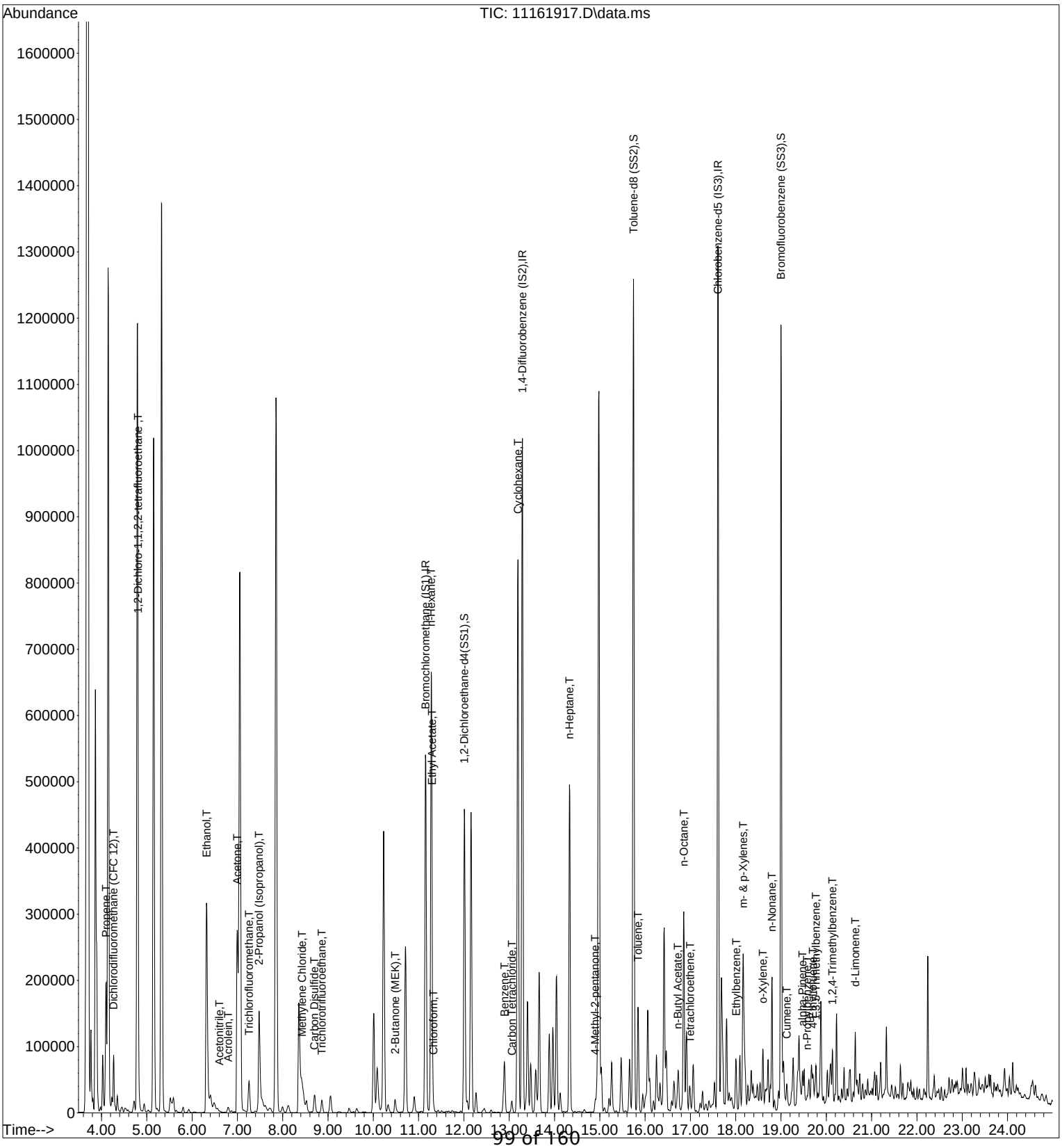
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.15	130	239703	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	13.29	114	998462	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	17.61	82	451638	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.01	65	355709	11.595	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.80%				
57) Toluene-d8 (SS2)	15.74	98	995179	12.592	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.72%				
73) Bromofluorobenzene (SS3)	19.00	174	384850	13.631	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 109.04%				
Target Compounds							Qvalue
2) Propene	4.10	42	67009	1.654	ng		97
3) Dichlorodifluoromethan...	4.27	85	78300	1.573	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	1862	0.075	ng		92
10) Ethanol	6.32	45	551380	23.826	ng		99
11) Acetonitrile	6.60	41	3576	0.062	ng		87
12) Acrolein	6.80	56	2034	0.111	ng		96
13) Acetone	7.00	58	175512	8.151	ng	#	62
14) Trichlorofluoromethane	7.26	101	51027	1.200	ng		99
15) 2-Propanol (Isopropanol)	7.48	45	291170	4.735	ng		100
19) Methylene Chloride	8.43	84	1718	0.065	ng		86
21) Trichlorotrifluoroethane	8.86	151	8911	0.408	ng		95
22) Carbon Disulfide	8.70	76	54294	0.575	ng		99
27) 2-Butanone (MEK)	10.48	72	8086	0.472	ng		96
30) Ethyl Acetate	11.30	61	5568	0.615	ng	#	40
31) n-Hexane	11.28	57	369626	8.493	ng		99
32) Chloroform	11.33	83	7368	0.175	ng		97
41) Benzene	12.90	78	71666	0.709	ng		100
42) Carbon Tetrachloride	13.06	117	4494	0.153	ng		100
43) Cyclohexane	13.19	84	366311	9.753	ng		99
51) n-Heptane	14.33	71	132177	5.219	ng		99
53) 4-Methyl-2-pentanone	14.90	58	6813	0.285	ng		98
58) Toluene	15.84	91	134391	1.612	ng		100
62) n-Butyl Acetate	16.72	43	29896	0.477	ng	#	69
63) n-Octane	16.85	57	64365	3.024	ng		100
64) Tetrachloroethene	16.99	166	6602	0.265	ng		98
66) Ethylbenzene	18.01	91	46526	0.459	ng		99
67) m- & p-Xylenes	18.16	91	177075	2.333	ng		97
70) o-Xylene	18.60	91	50202	0.698	ng		99
71) n-Nonane	18.80	43	77158	1.499	ng		98
74) Cumene	19.13	105	7664	0.081	ng		100
75) alpha-Pinene	19.48	93	19269	0.412	ng		97
76) n-Propylbenzene	19.58	91	9054	0.076	ng		84
78) 4-Ethyltoluene	19.70	105	5155	0.061	ng		98
79) 1,3,5-Trimethylbenzene	19.77	105	17089	0.221	ng		99
82) 1,2,4-Trimethylbenzene	20.13	105	23062	0.306	ng		90
91) d-Limonene	20.64	68	24909	0.878	ng		91

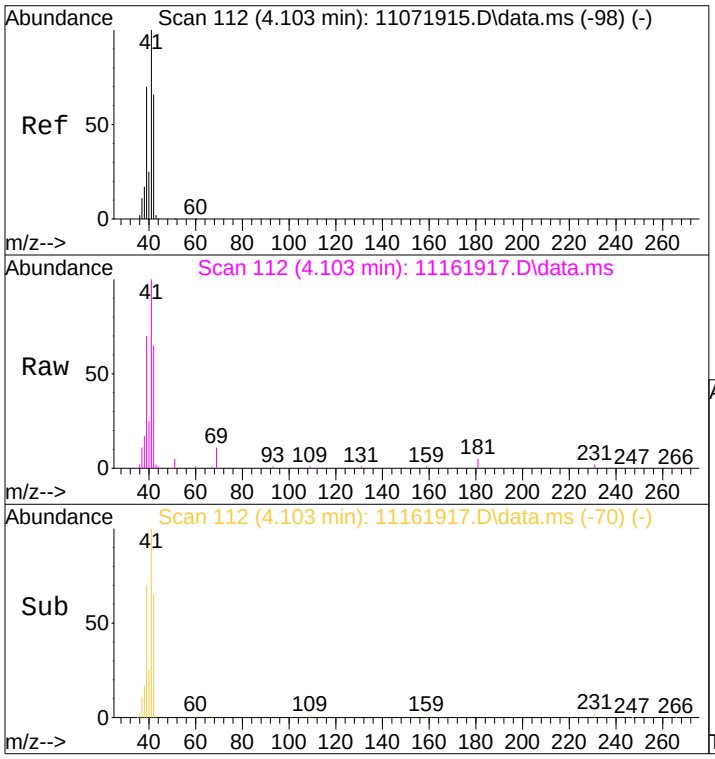
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\16\11161917.D
Acq On : 16 Nov 2019 12:31 Operator: WA
Sample : P1906559-001dup (1000mL)
Misc : S31-10161904
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Nov 20 15:01:36 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

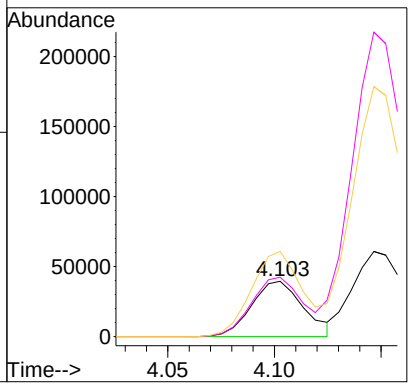


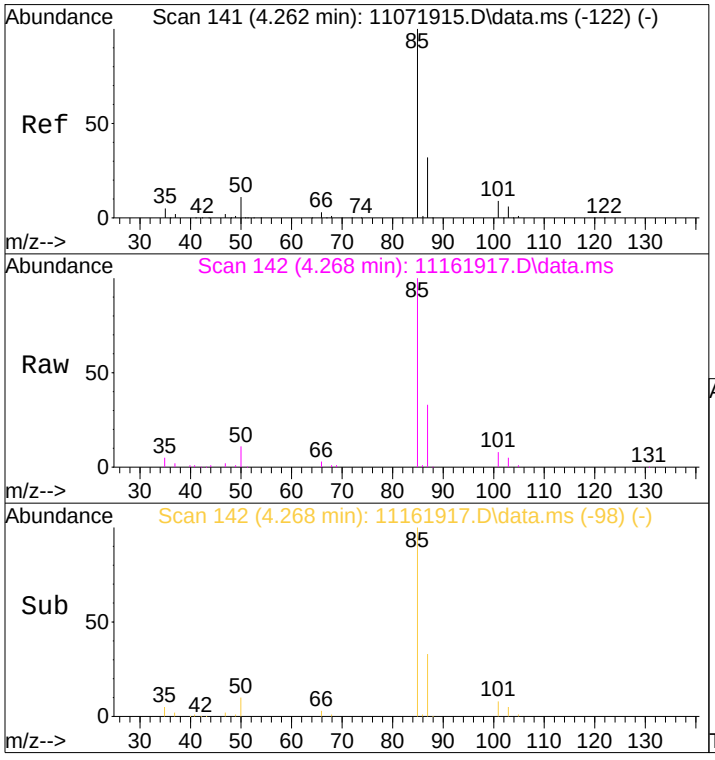


#2
Propene
Concen: 1.65 ng
RT: 4.10 min Scan# 112
Delta R.T. -0.017 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 42 Resp: 67009

Ion	Ratio	Lower	Upper
42	100		
39	105.6	87.0	127.0
41	147.1	132.2	172.2

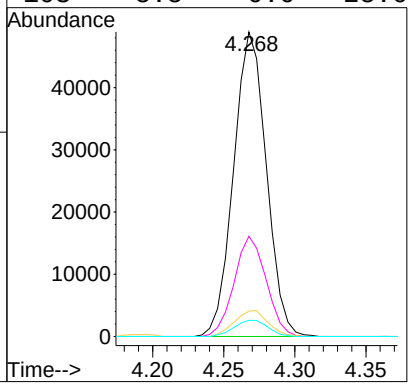


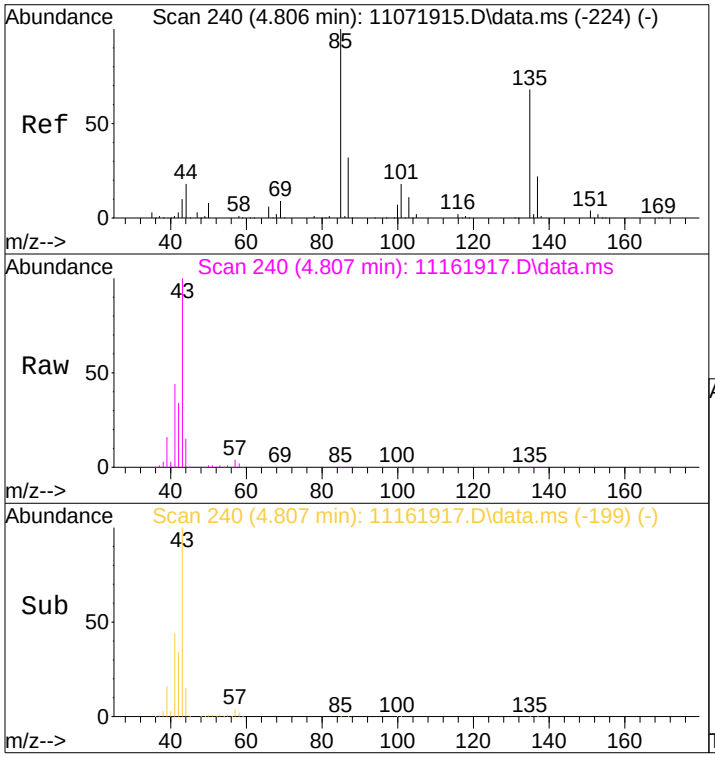


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.57 ng
RT: 4.27 min Scan# 142
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 85 Resp: 78300

Ion	Ratio	Lower	Upper
85	100		
87	32.1	12.3	52.3
101	8.8	0.0	28.6
103	5.5	0.0	25.6

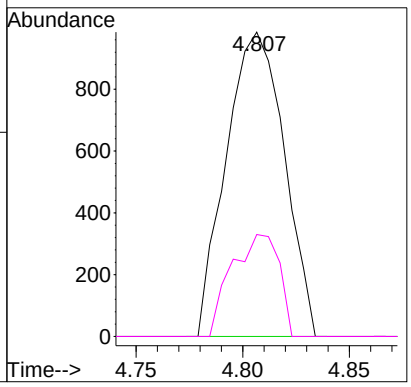


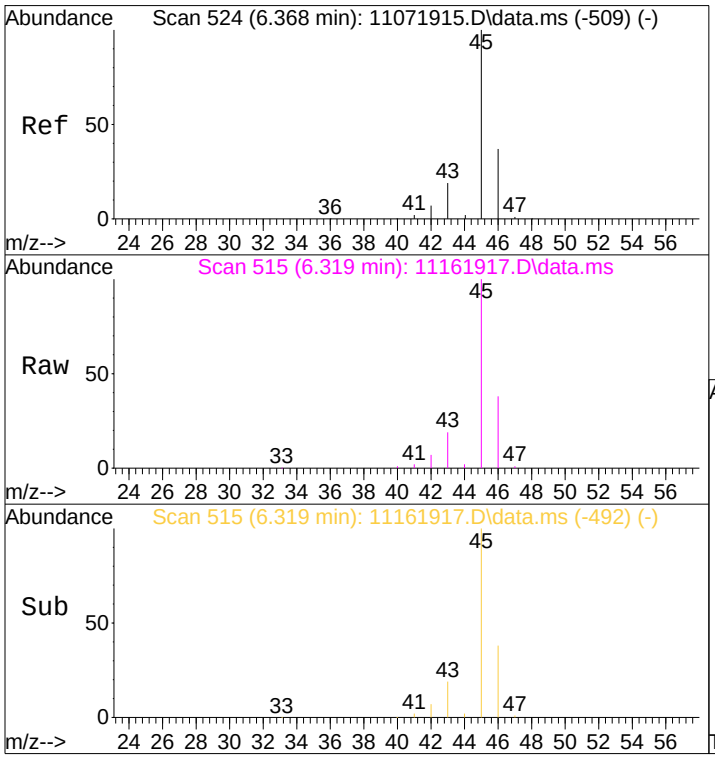


#5
1,2-Dichloro-1,1,2,2-tetrafluoroethane
Concen: 0.08 ng
RT: 4.81 min Scan# 240
Delta R.T. -0.022 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:135 Resp: 1862

Ion	Ratio	Lower	Upper
135	100		
137	27.4	12.0	52.0

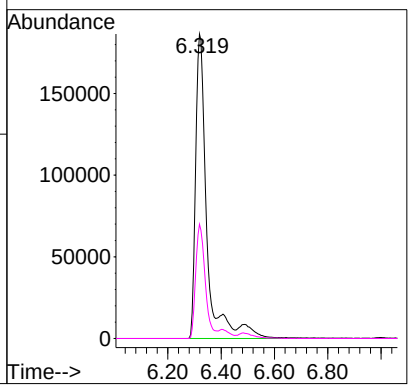


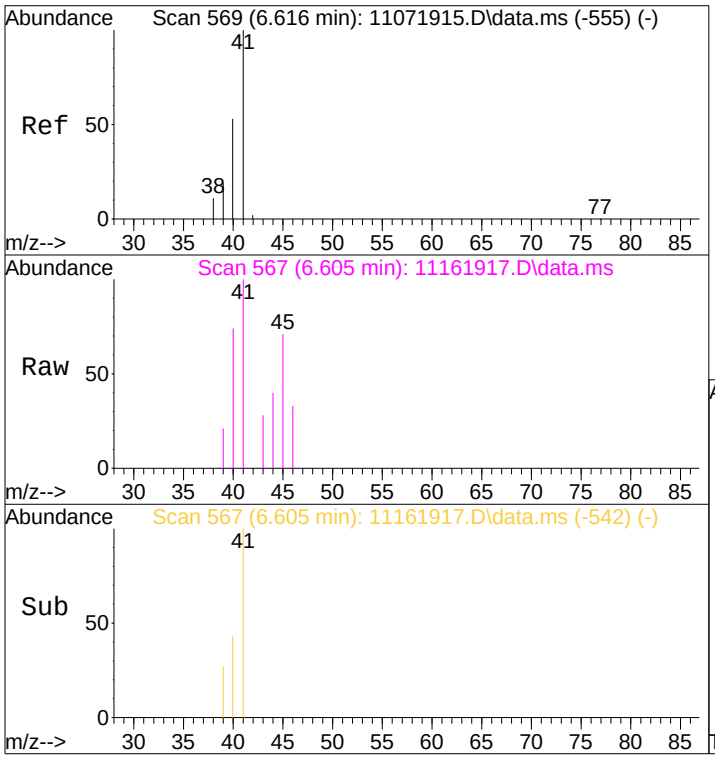


#10
Ethanol
Concen: 23.83 ng
RT: 6.32 min Scan# 515
Delta R.T. -0.121 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 45 Resp: 551380

Ion	Ratio	Lower	Upper
45	100		
46	36.9	17.3	57.3

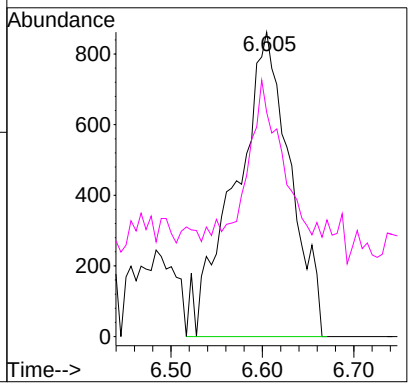


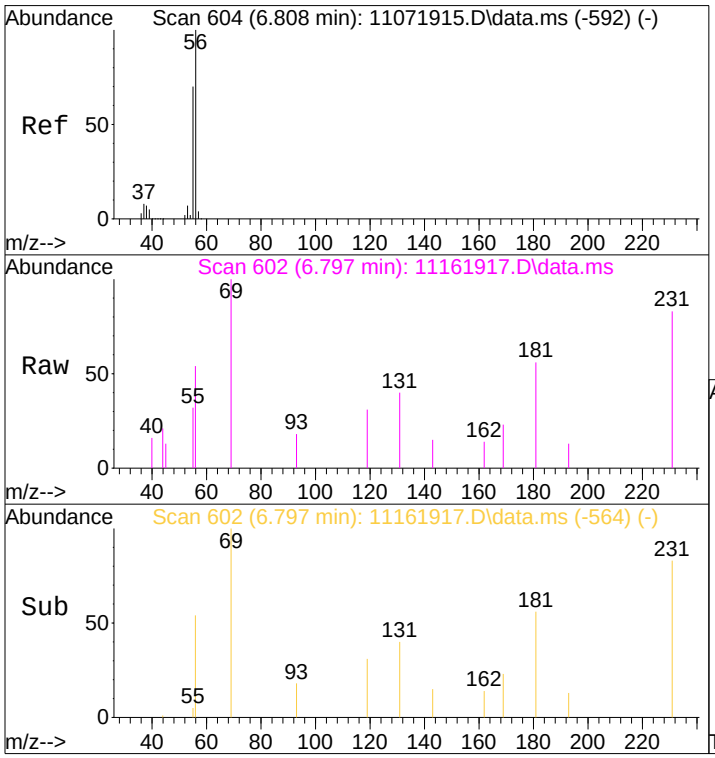


#11
Acetonitrile
Concen: 0.06 ng
RT: 6.60 min Scan# 567
Delta R.T. -0.060 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 41 Resp: 3576

Ion	Ratio	Lower	Upper
41	100		
40	43.9	32.8	72.8

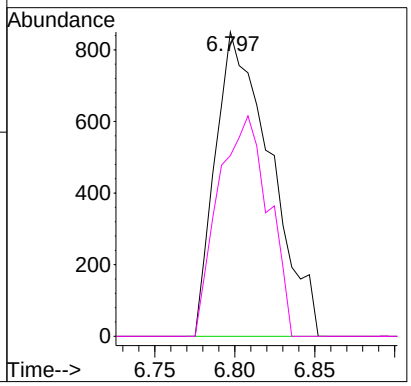


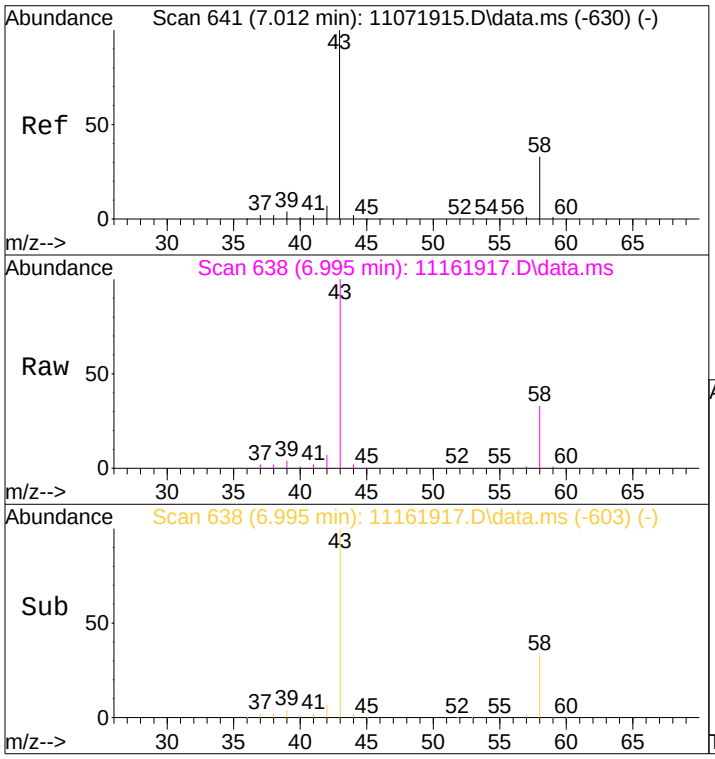


#12
Acrolein
Concen: 0.11 ng
RT: 6.80 min Scan# 602
Delta R.T. -0.039 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 56 Resp: 2034

Ion	Ratio	Lower	Upper
56	100		
55	66.2	49.7	89.7

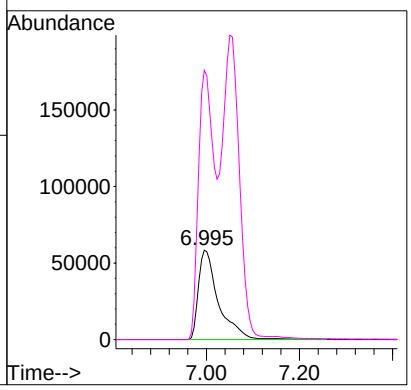


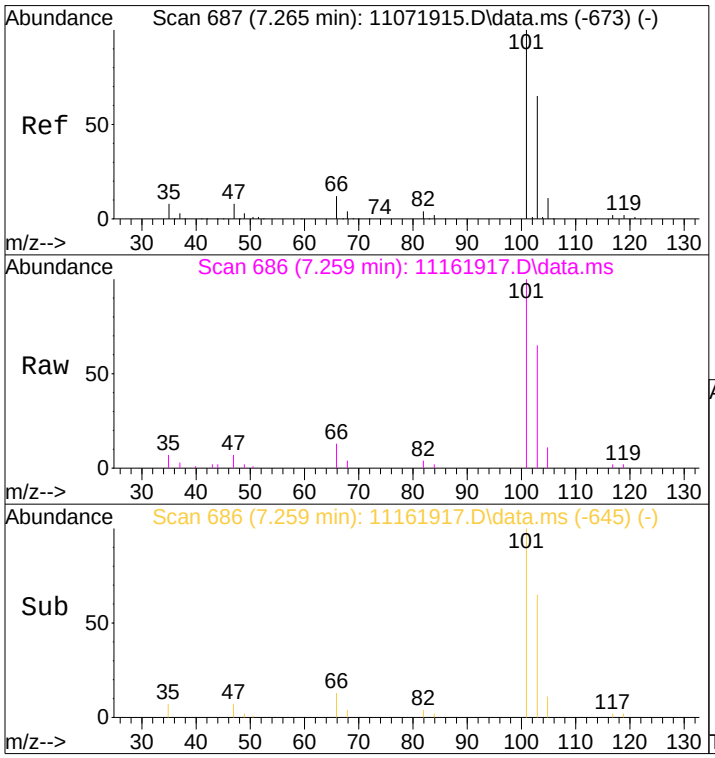


#13
Acetone
Concen: 8.15 ng
RT: 7.00 min Scan# 638
Delta R.T. -0.055 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 58 Resp: 175512

Ion	Ratio	Lower	Upper
58	100		
43	231.2	276.0	336.0#

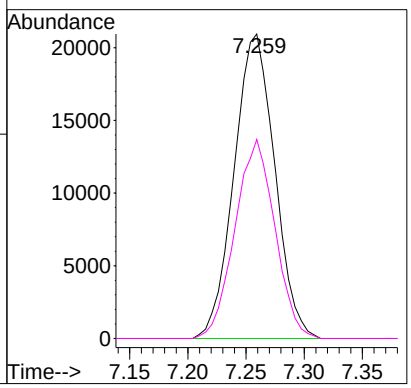


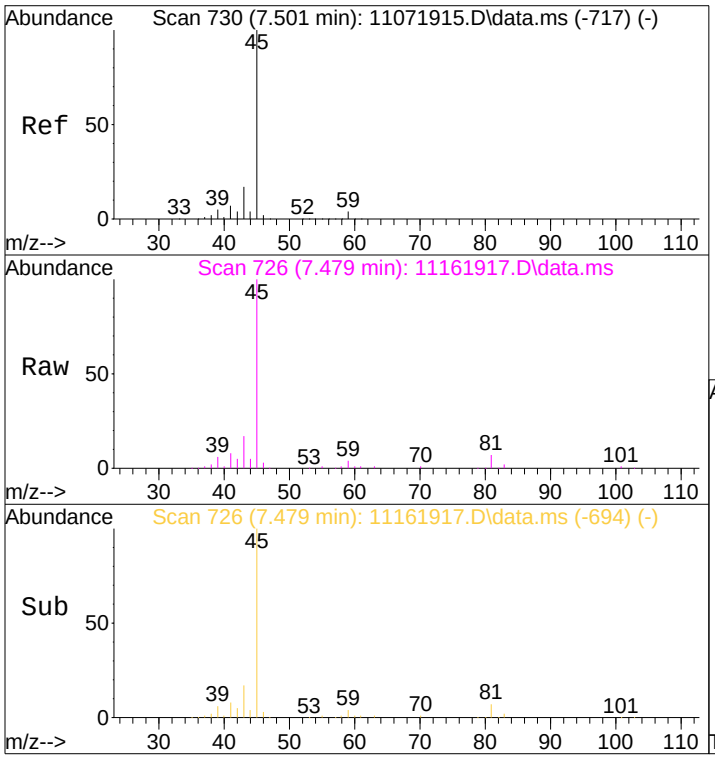


#14
Trichlorofluoromethane
Concen: 1.20 ng
RT: 7.26 min Scan# 686
Delta R.T. -0.022 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:101 Resp: 51027

Ion	Ratio	Lower	Upper
101	100		
103	64.1	44.8	84.8

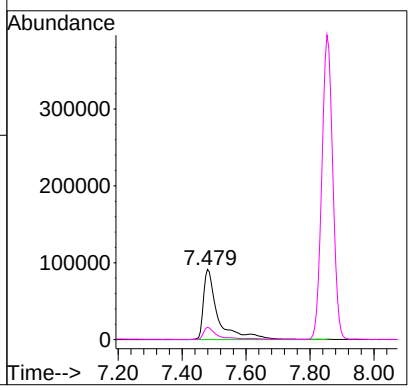


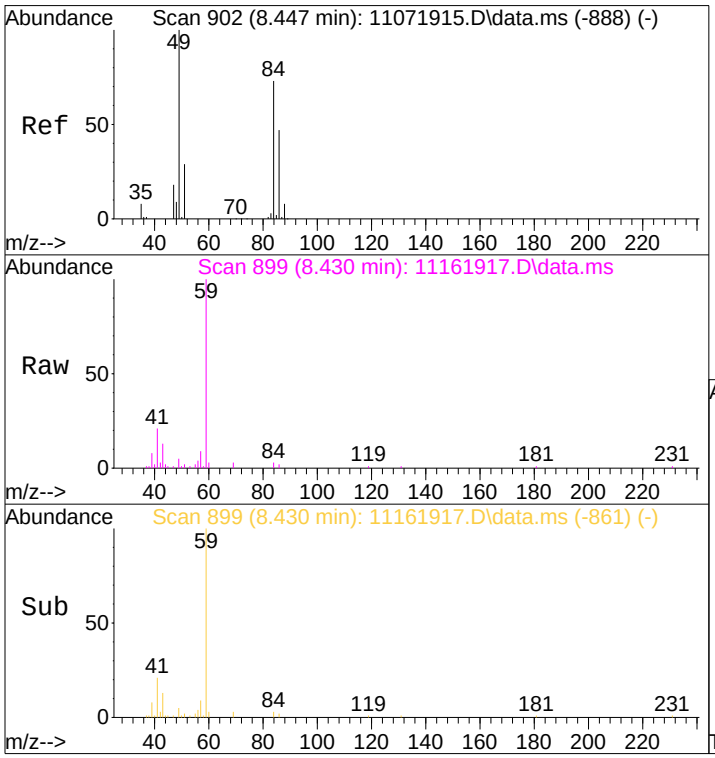


#15
2-Propanol (Isopropanol)
Concen: 4.73 ng
RT: 7.48 min Scan# 726
Delta R.T. -0.072 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 45 Resp: 291170

Ion	Ratio	Lower	Upper
45	100		
43	17.2	0.0	37.3

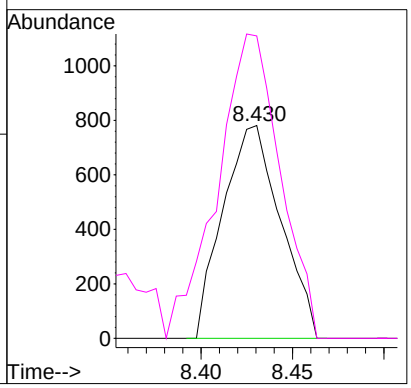


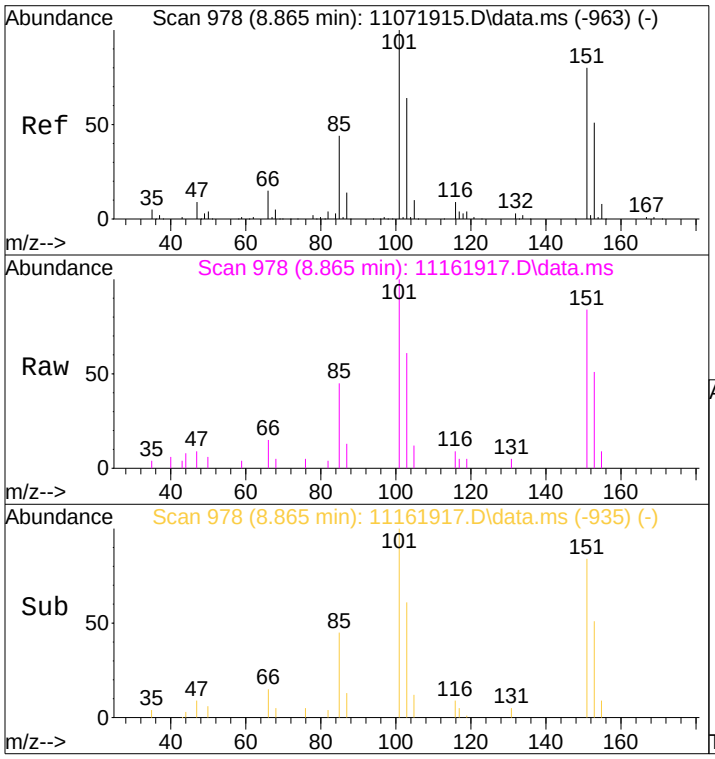


#19
Methylene Chloride
Concen: 0.06 ng
RT: 8.43 min Scan# 899
Delta R.T. -0.039 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 84 Resp: 1718

Ion	Ratio	Lower	Upper
84	100		
49	155.5	113.7	163.7

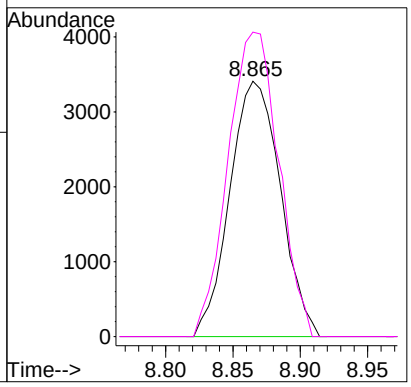


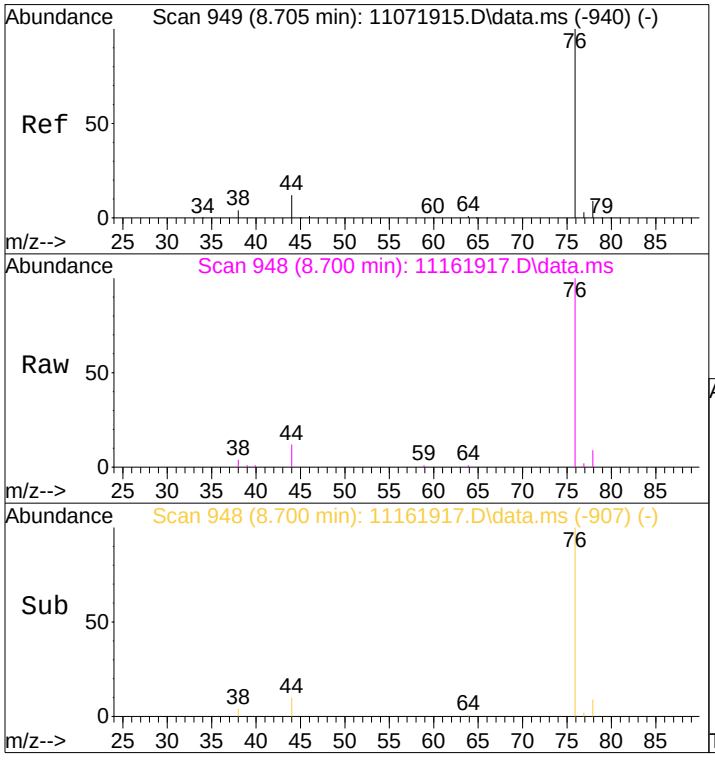


#21
Trichlorotrifluoroethane
Concen: 0.41 ng
RT: 8.86 min Scan# 978
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:151 Resp: 8911

Ion	Ratio	Lower	Upper
151	100		
101	119.5	104.6	144.6

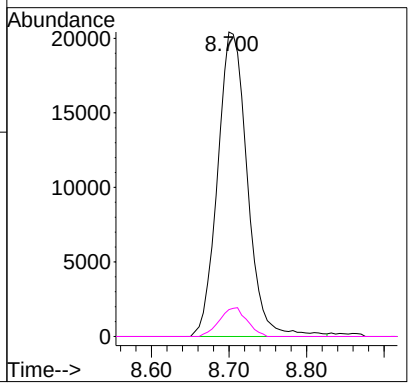


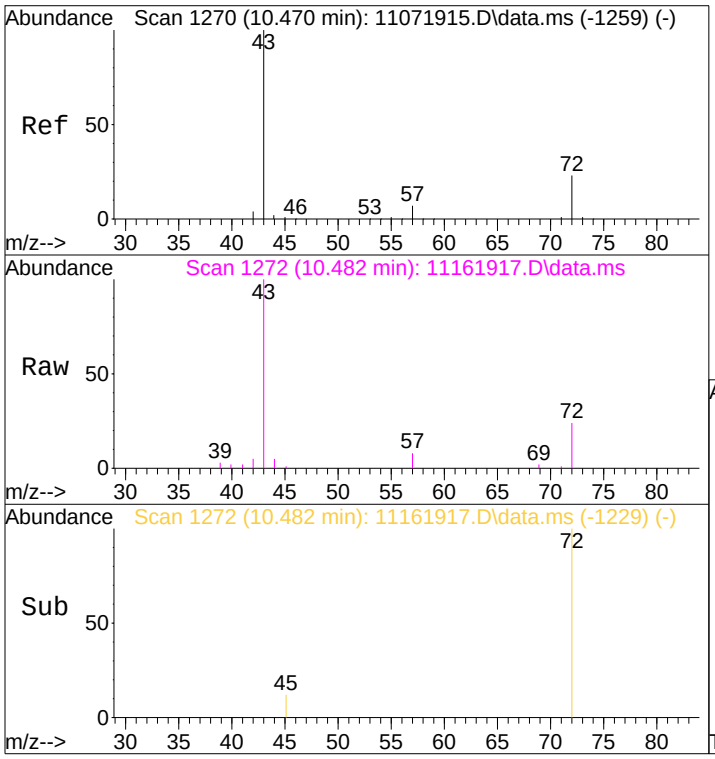


#22
Carbon Disulfide
Concen: 0.58 ng
RT: 8.70 min Scan# 948
Delta R.T. -0.022 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 76 Resp: 54294

Ion	Ratio	Lower	Upper
76	100		
78	8.8	0.0	29.1

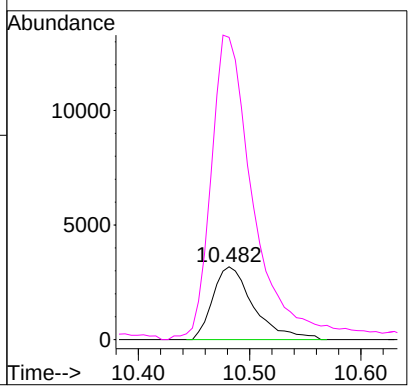


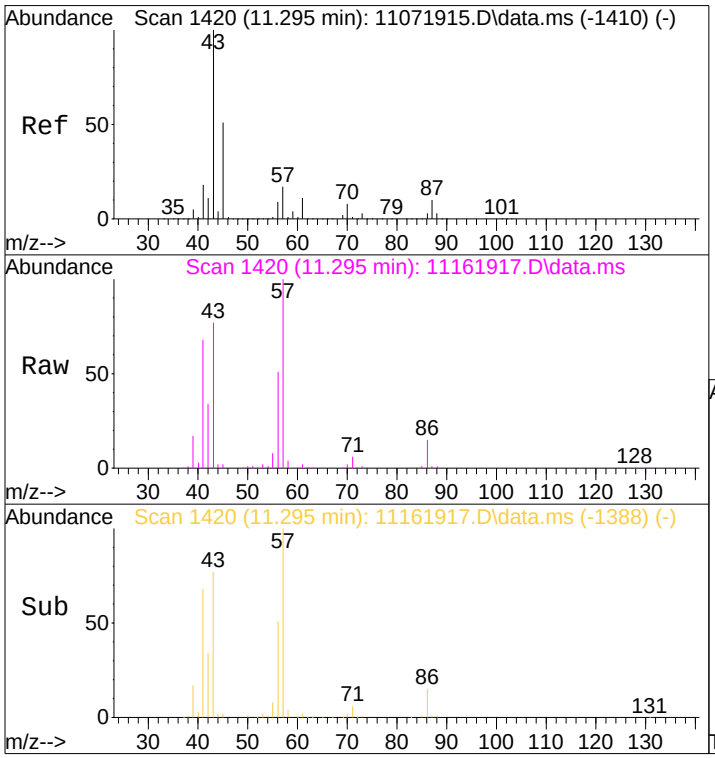


#27
2-Butanone (MEK)
Concen: 0.47 ng
RT: 10.48 min Scan# 1272
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 72 Resp: 8086

Ion	Ratio	Lower	Upper
72	100		
43	451.0	419.6	459.6

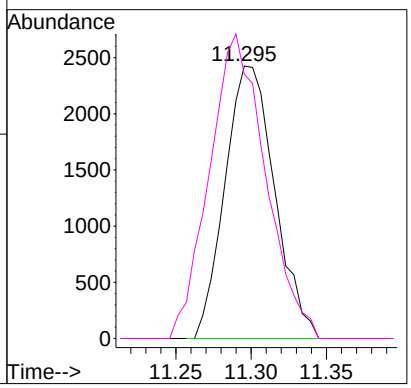


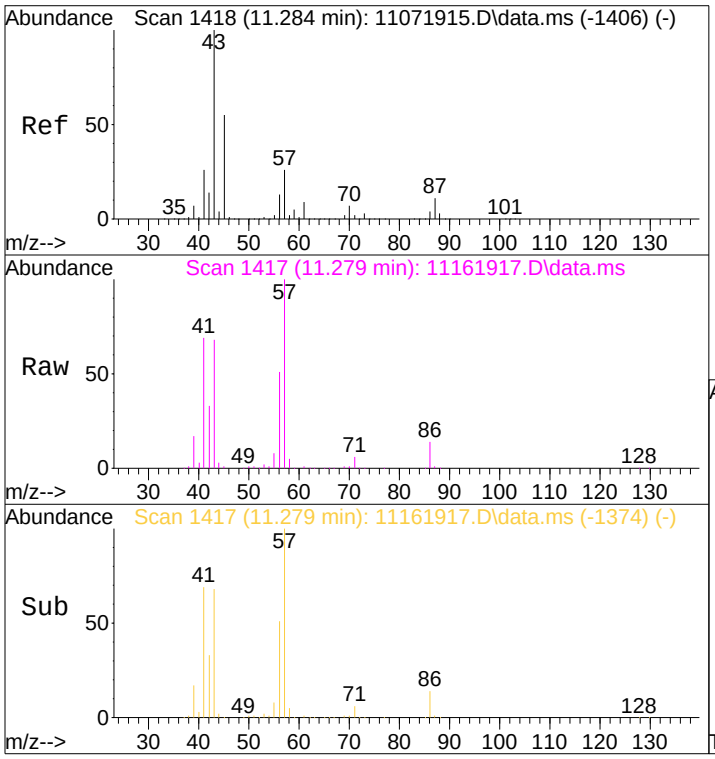


#30
Ethyl Acetate
Concen: 0.61 ng
RT: 11.30 min Scan# 1420
Delta R.T. -0.022 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 61 Resp: 5568

Ion	Ratio	Lower	Upper
61	100		
70	126.0	54.8	94.8#

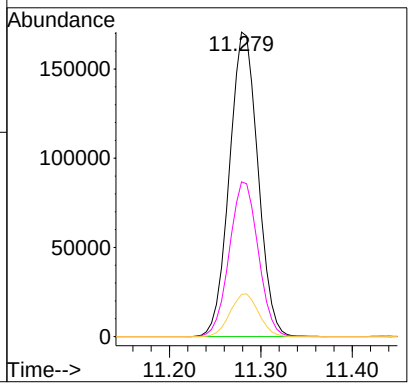


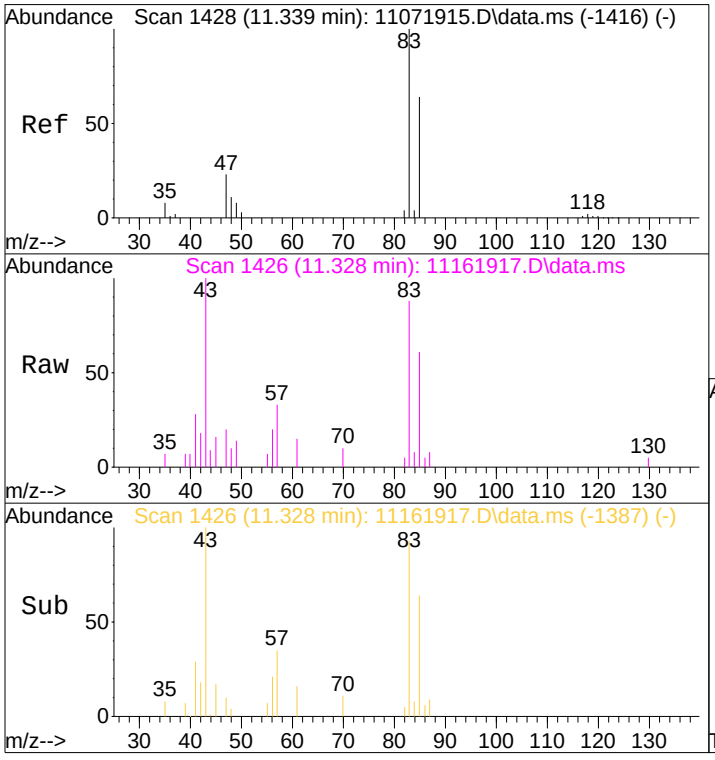


#31
n-Hexane
Concen: 8.49 ng
RT: 11.28 min Scan# 1417
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 57 Resp: 369626

Ion	Ratio	Lower	Upper
57	100		
56	51.4	40.7	61.1
86	14.1	12.0	18.0

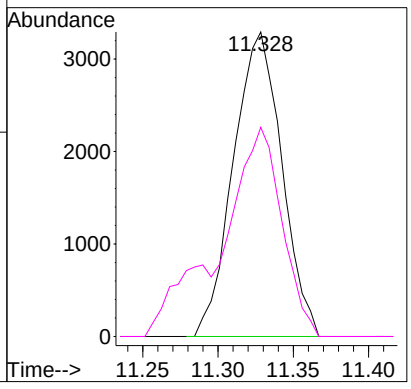


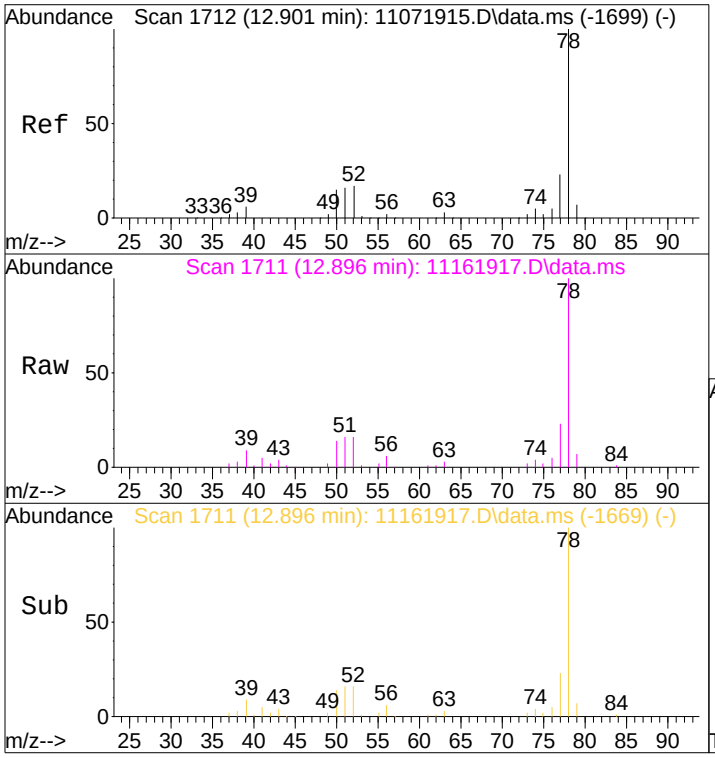


#32
Chloroform
Concen: 0.17 ng
RT: 11.33 min Scan# 1426
Delta R.T. -0.033 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 83 Resp: 7368

Ion	Ratio	Lower	Upper
83	100		
85	68.0	45.3	85.3

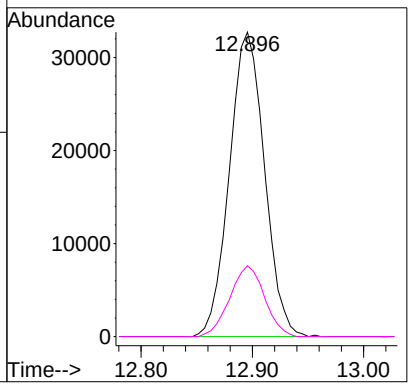


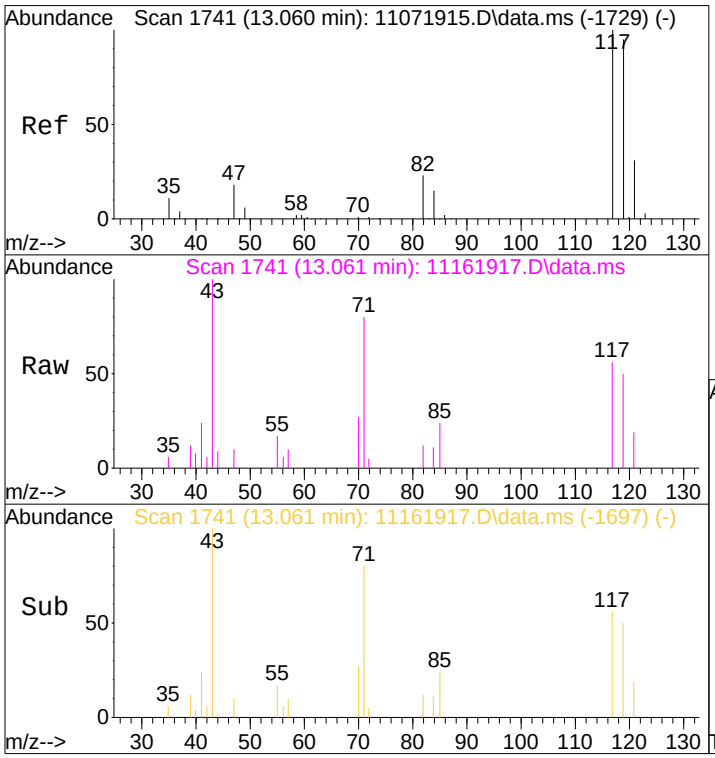


#41
Benzene
Concen: 0.71 ng
RT: 12.90 min Scan# 1711
Delta R.T. -0.017 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 78 Resp: 71666

Ion	Ratio	Lower	Upper
78	100		
77	23.0	3.2	43.2

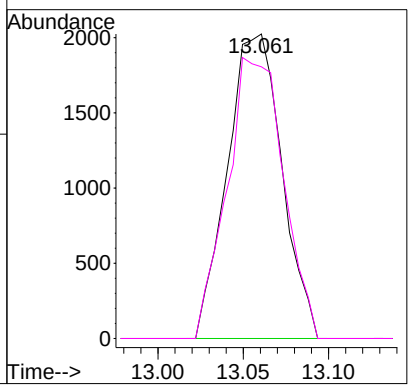


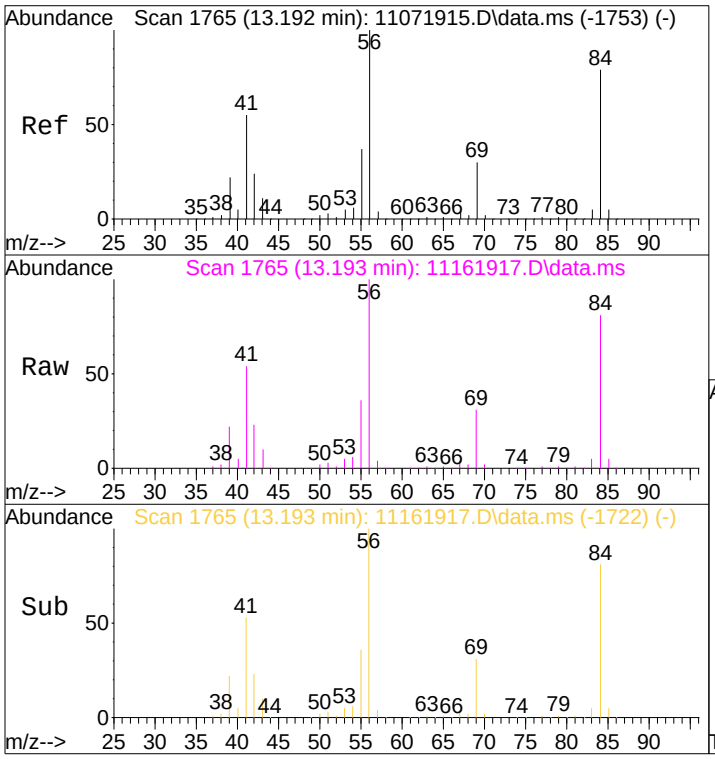


#42
Carbon Tetrachloride
Concen: 0.15 ng
RT: 13.06 min Scan# 1741
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:117 Resp: 4494

Ion	Ratio	Lower	Upper
117	100		
119	95.5	75.8	115.8

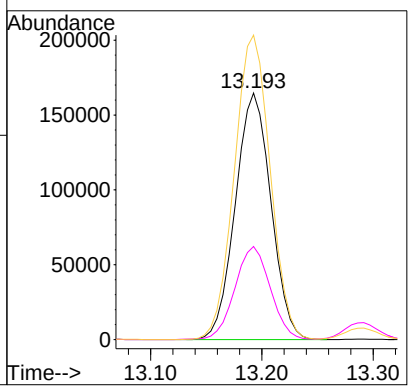


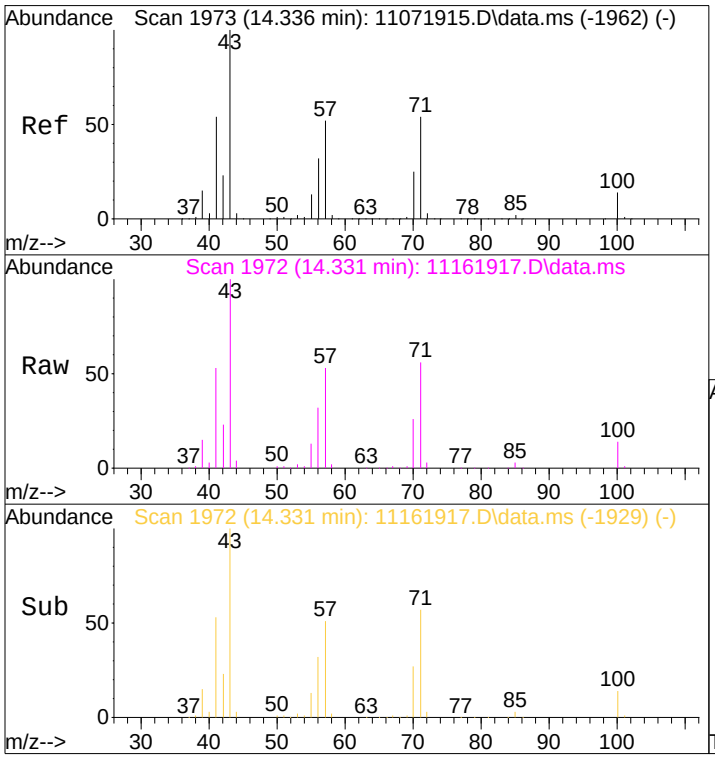


#43
Cyclohexane
Concen: 9.75 ng
RT: 13.19 min Scan# 1765
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 84 Resp: 366311

Ion	Ratio	Lower	Upper
84	100		
69	37.6	17.6	57.6
56	124.6	106.5	146.5

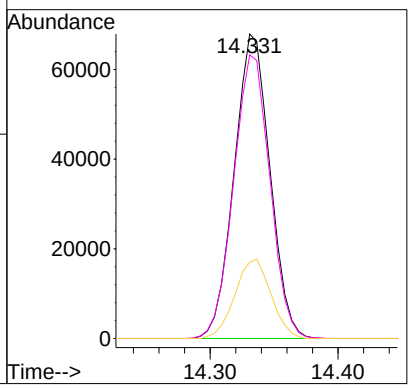


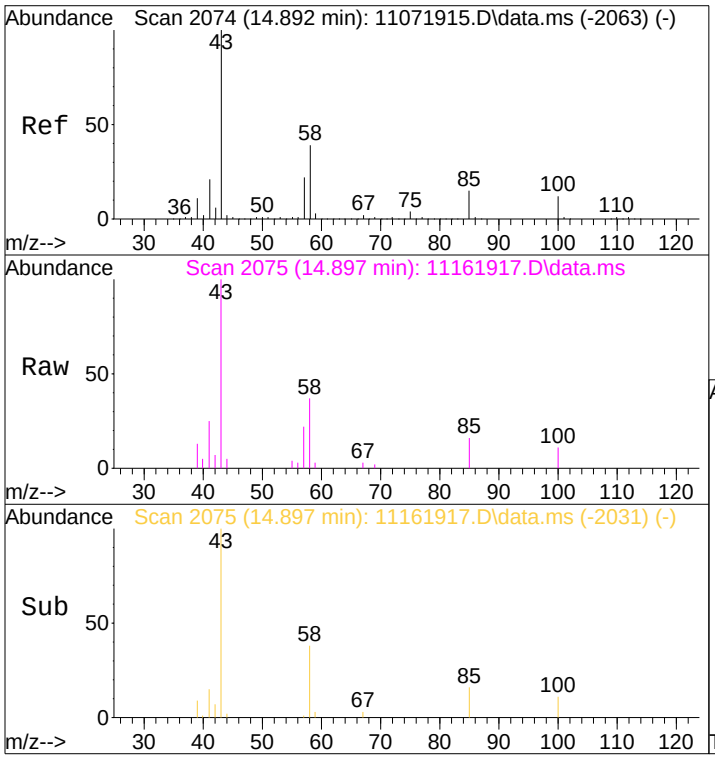


#51
n-Heptane
Concen: 5.22 ng
RT: 14.33 min Scan# 1972
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 71 Resp: 132177

Ion	Ratio	Lower	Upper
71	100		
57	94.4	75.9	115.9
100	26.2	6.0	46.0

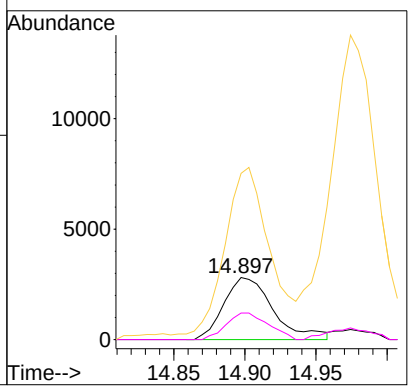


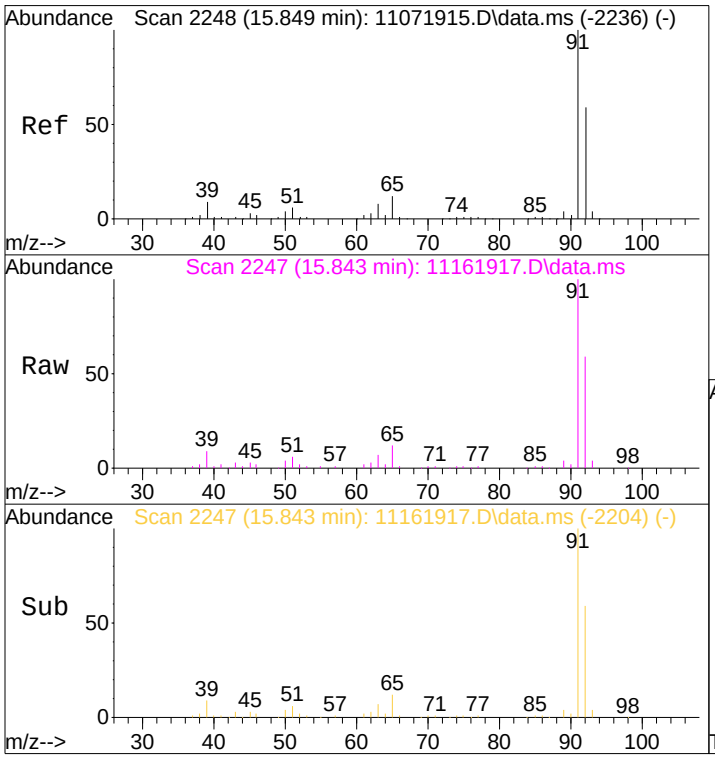


#53
4-Methyl-2-pentanone
Concen: 0.29 ng
RT: 14.90 min Scan# 2075
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 58 Resp: 6813

Ion	Ratio	Lower	Upper
58	100		
85	36.3	32.8	49.2
43	257.5	205.2	307.8

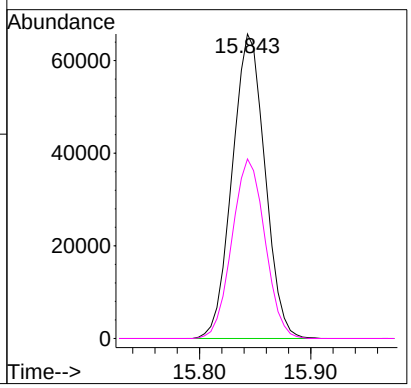


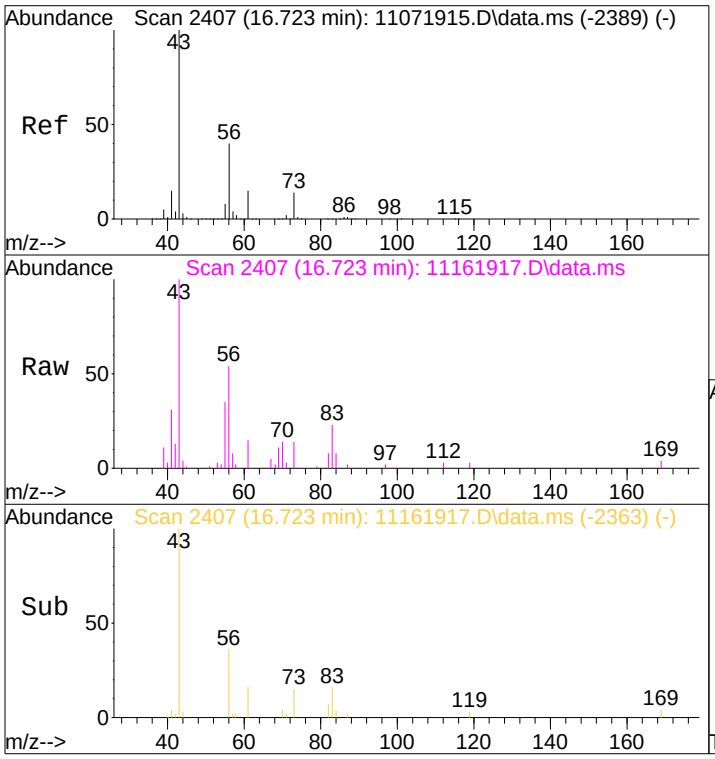


#58
Toluene
Concen: 1.61 ng
RT: 15.84 min Scan# 2247
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 91 Resp: 134391

Ion	Ratio	Lower	Upper
91	100		
92	59.2	39.4	79.4

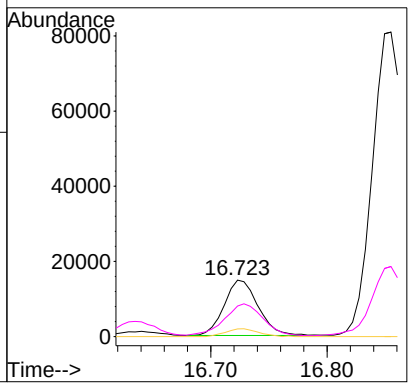


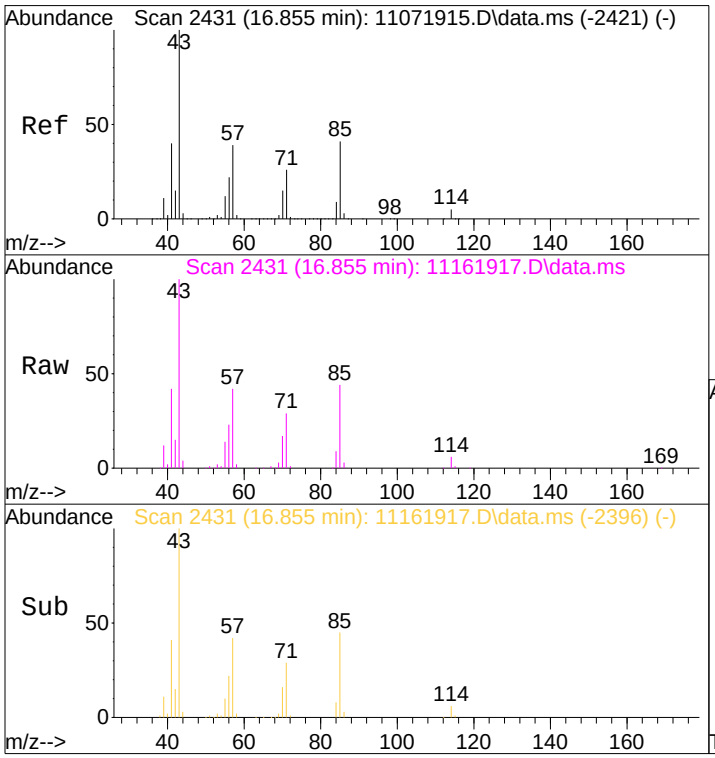


#62
n-Butyl Acetate
Concen: 0.48 ng
RT: 16.72 min Scan# 2407
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 43 Resp: 29896

Ion	Ratio	Lower	Upper
43	100		
56	64.8	19.6	59.6#
73	13.7	0.0	33.6

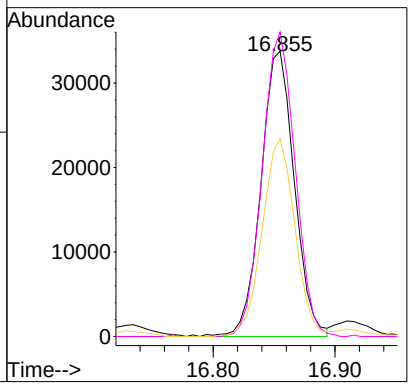


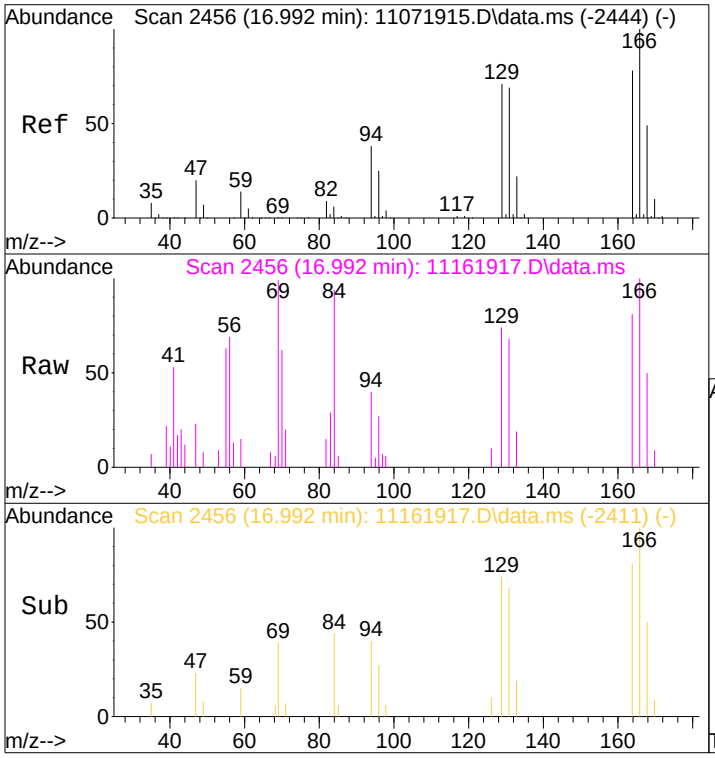


#63
n-Octane
Concen: 3.02 ng
RT: 16.85 min Scan# 2431
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 57 Resp: 64365

Ion	Ratio	Lower	Upper
57	100		
85	104.7	83.7	125.5
71	67.8	53.8	80.8

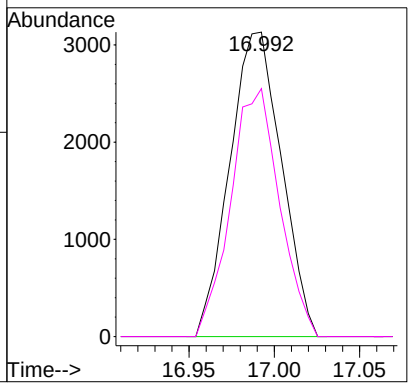


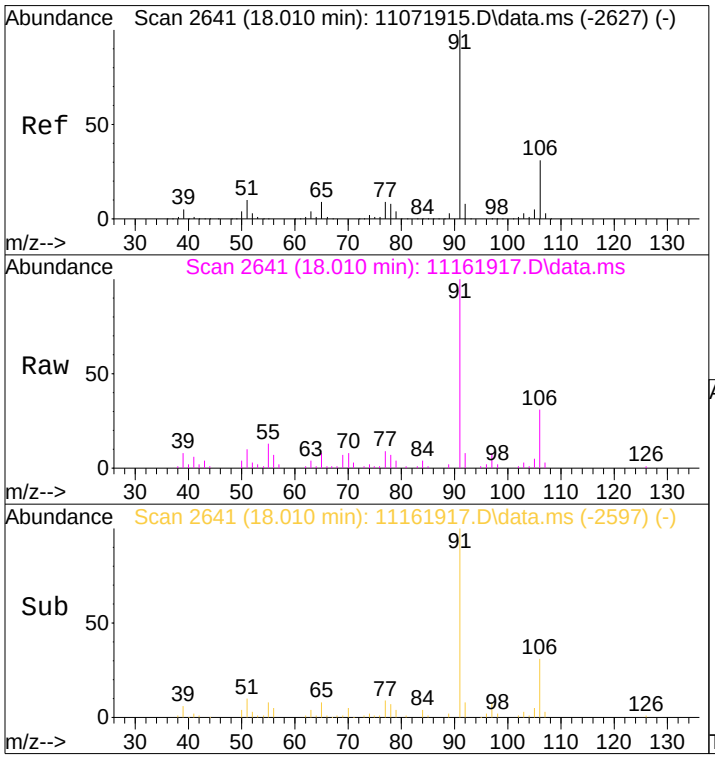


#64
Tetrachloroethene
Concen: 0.27 ng
RT: 16.99 min Scan# 2456
Delta R.T. -0.000 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:166 Resp: 6602

Ion	Ratio	Lower	Upper
166	100		
164	76.8	58.3	98.3

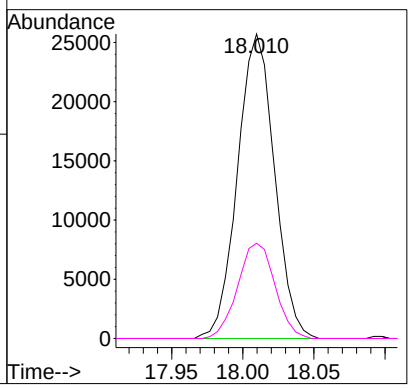


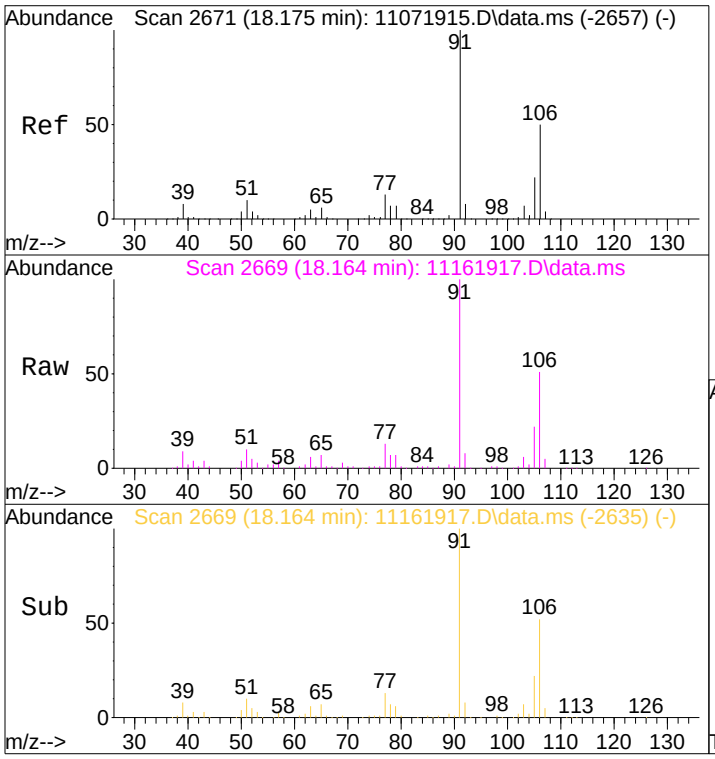


#66
Ethylbenzene
Concen: 0.46 ng
RT: 18.01 min Scan# 2641
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 91 Resp: 46526

Ion	Ratio	Lower	Upper
91	100		
106	31.6	11.2	51.2

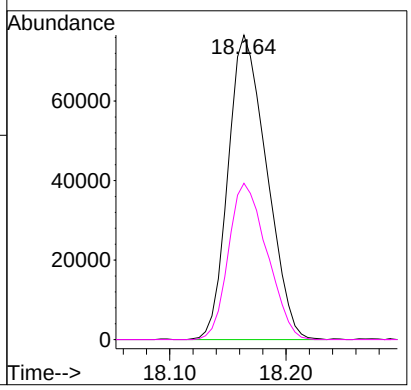


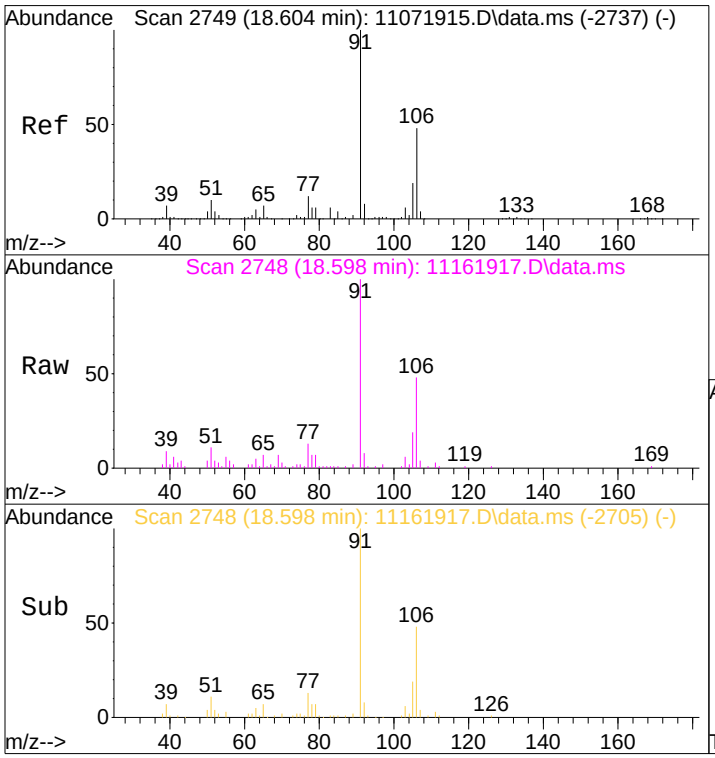


#67
m- & p-Xylenes
Concen: 2.33 ng
RT: 18.16 min Scan# 2669
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 91 Resp: 177075

Ion	Ratio	Lower	Upper
91	100		
106	51.2	29.0	69.0

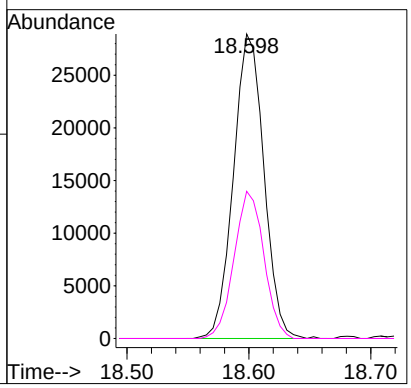


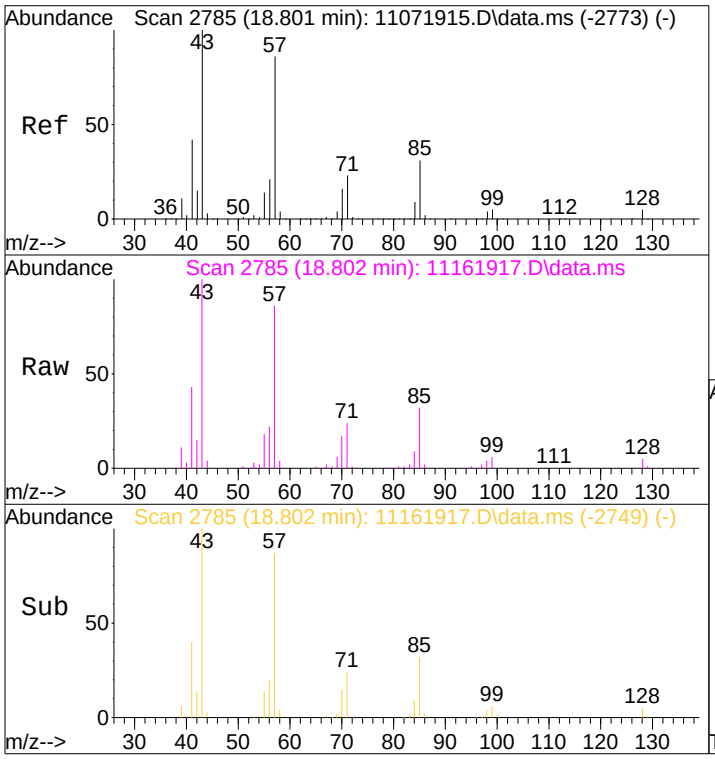


#70
o-Xylene
Concen: 0.70 ng
RT: 18.60 min Scan# 2748
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 91 Resp: 50202

Ion	Ratio	Lower	Upper
91	100		
106	47.4	28.0	68.0

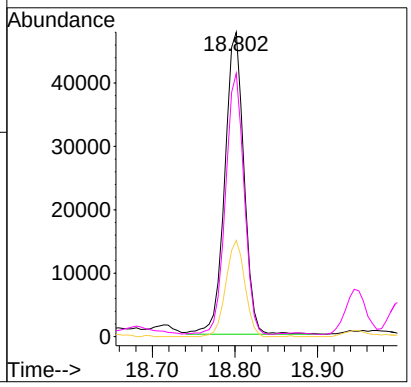


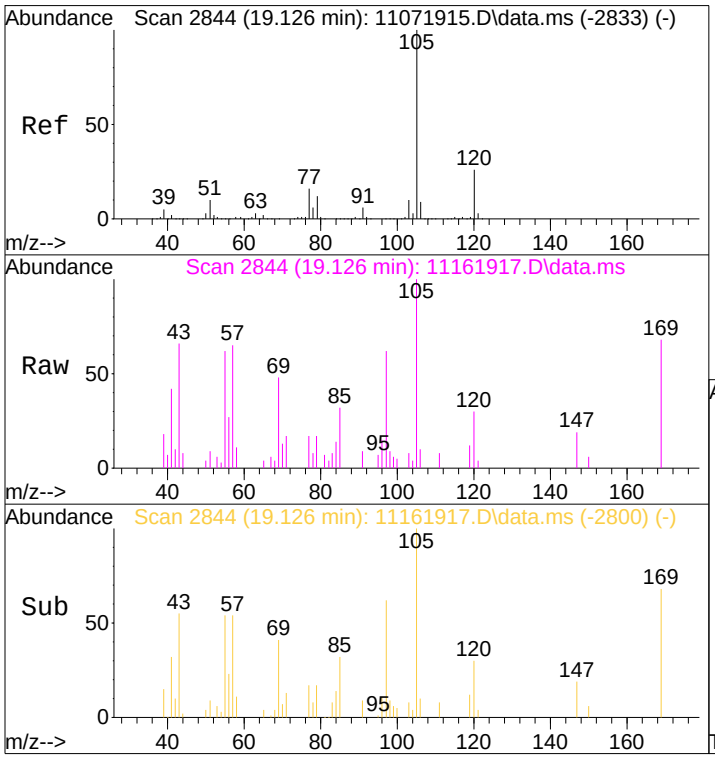


#71
n-Nonane
Concen: 1.50 ng
RT: 18.80 min Scan# 2785
Delta R.T. -0.000 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 43 Resp: 77158

Ion	Ratio	Lower	Upper
43	100		
57	83.4	65.8	105.8
85	31.3	10.4	50.4

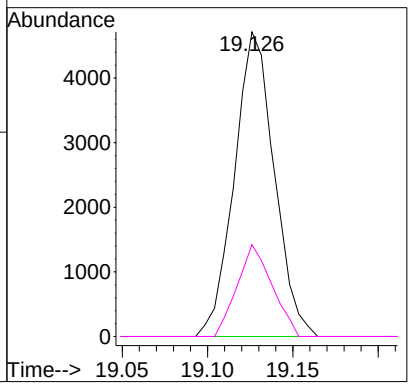


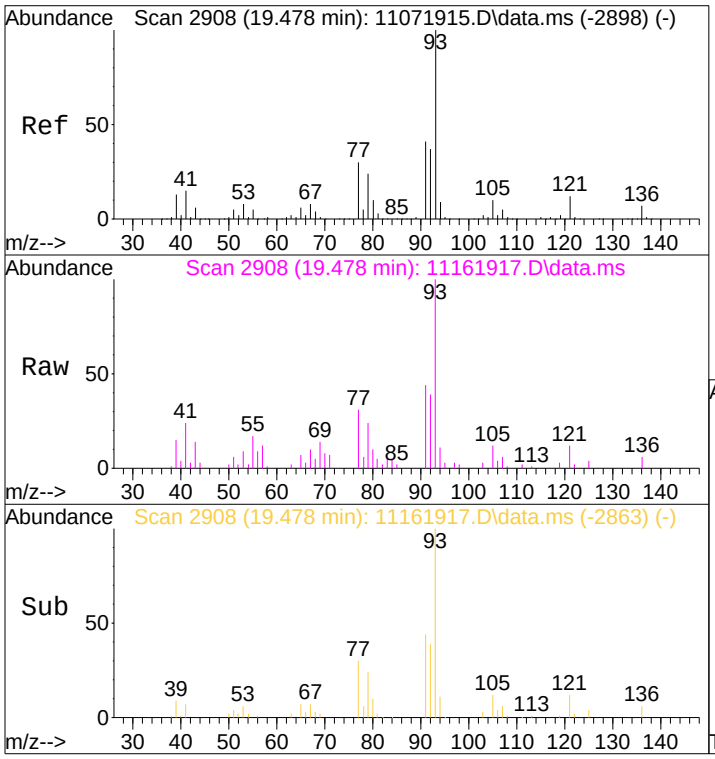


#74
Cumene
Concen: 0.08 ng
RT: 19.13 min Scan# 2844
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:105 Resp: 7664

Ion	Ratio	Lower	Upper
105	100		
120	26.4	6.6	46.6

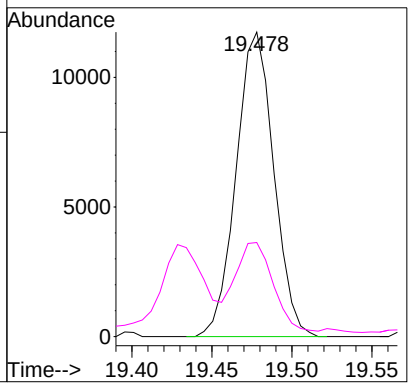


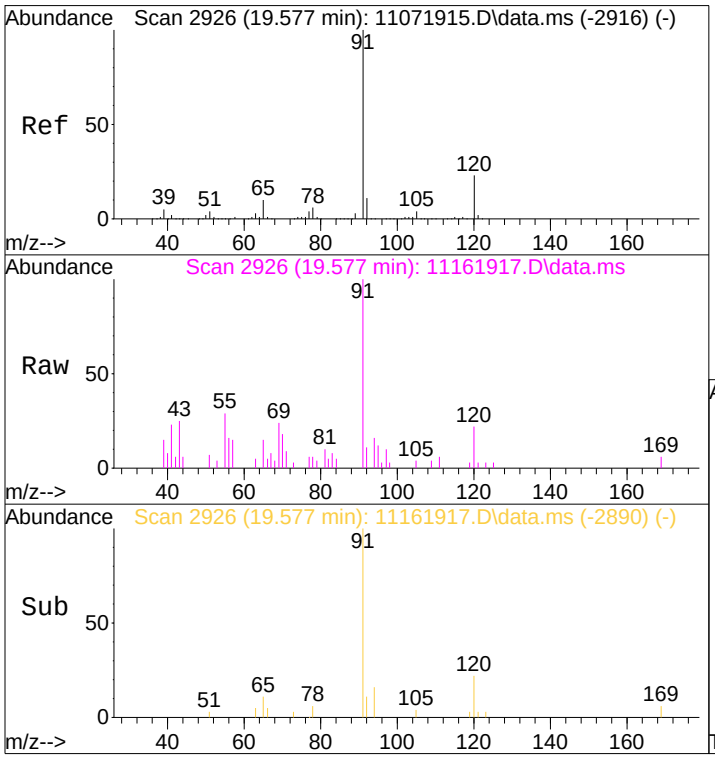


#75
alpha-Pinene
Concen: 0.41 ng
RT: 19.48 min Scan# 2908
Delta R.T. -0.000 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 93 Resp: 19269

Ion	Ratio	Lower	Upper
93	100		
77	29.2	10.7	50.7

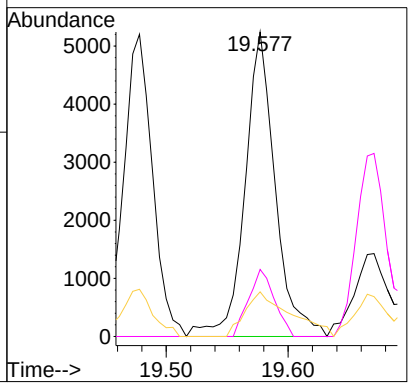


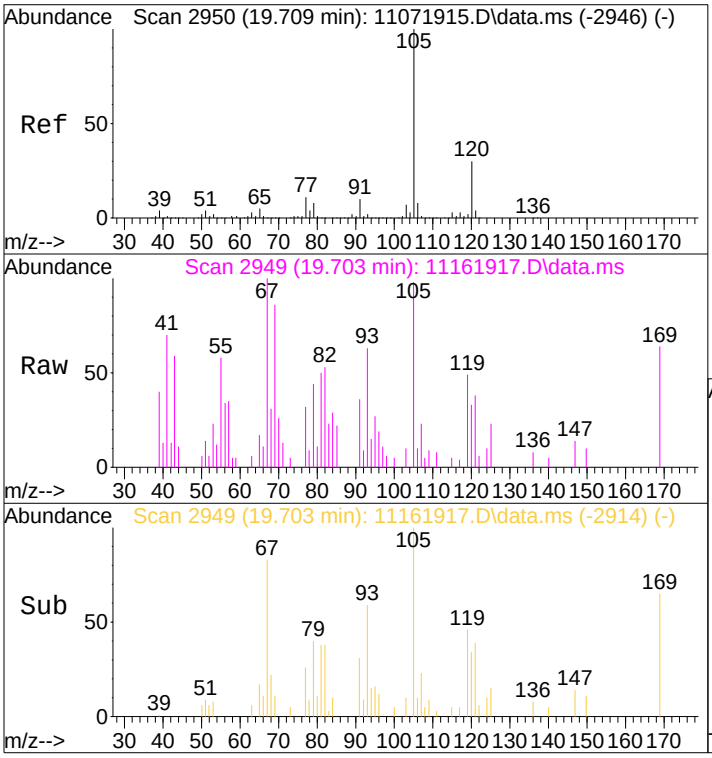


#76
n-Propylbenzene
Concen: 0.08 ng
RT: 19.58 min Scan# 2926
Delta R.T. -0.000 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 91 Resp: 9054

Ion	Ratio	Lower	Upper
91	100		
120	18.8	3.0	43.0
65	21.9	0.0	30.0

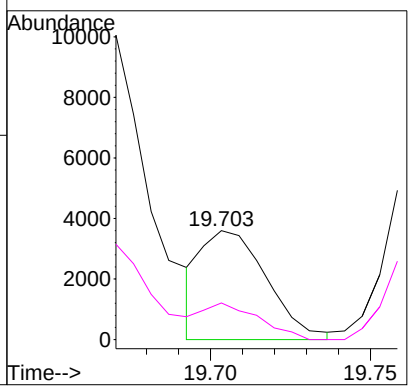


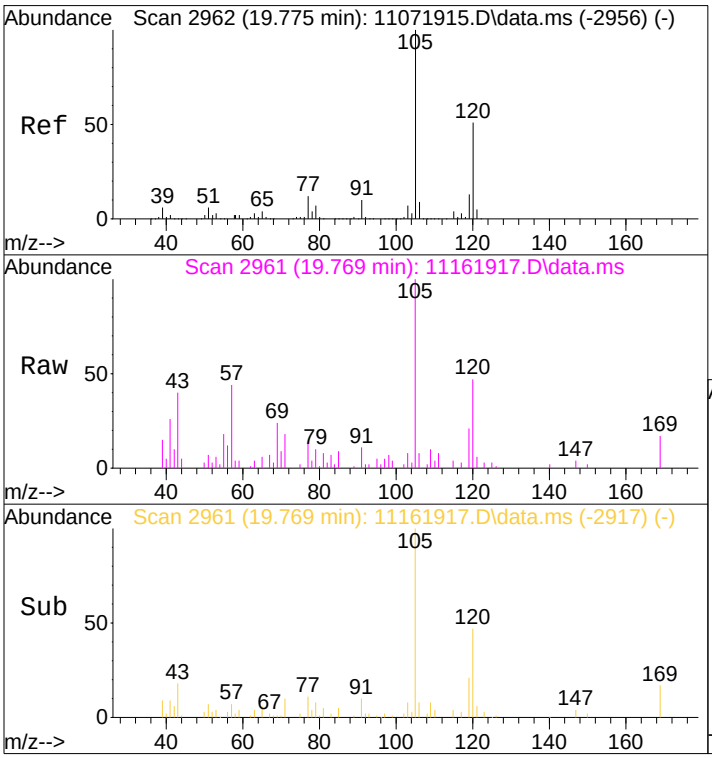


#78
4-Ethyltoluene
Concen: 0.06 ng
RT: 19.70 min Scan# 2949
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:105 Resp: 5155

Ion	Ratio	Lower	Upper
105	100		
120	29.2	10.5	50.5

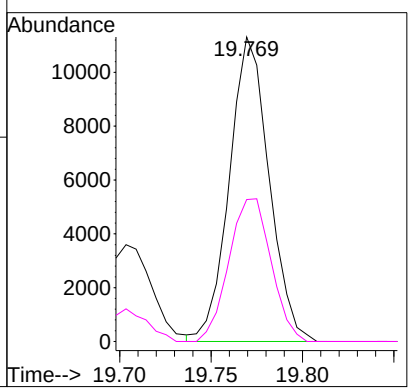


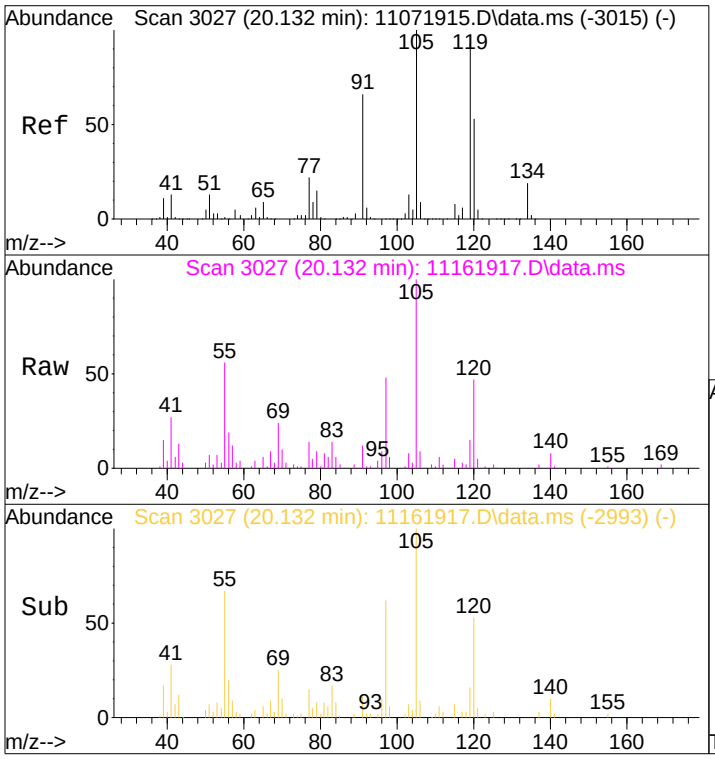


#79
1,3,5-Trimethylbenzene
Concen: 0.22 ng
RT: 19.77 min Scan# 2961
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:105 Resp: 17089

Ion	Ratio	Lower	Upper
105	100		
120	49.9	30.5	70.5

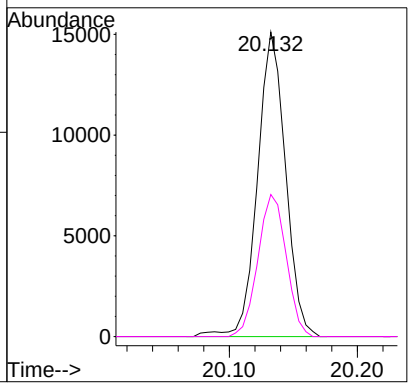


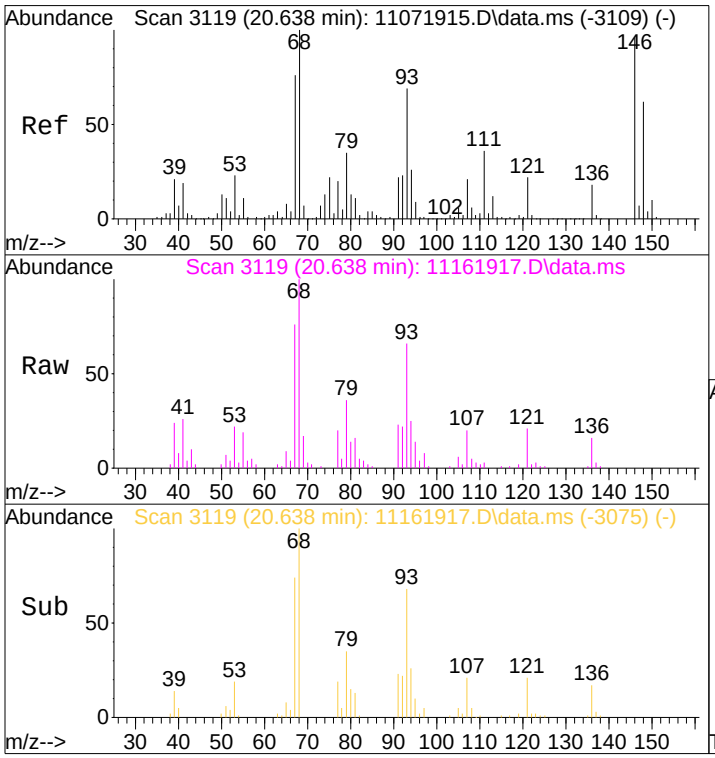


#82
1,2,4-Trimethylbenzene
Concen: 0.31 ng
RT: 20.13 min Scan# 3027
Delta R.T. -0.011 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion:105 Resp: 23062

Ion	Ratio	Lower	Upper
105	100		
120	47.1	34.3	74.3

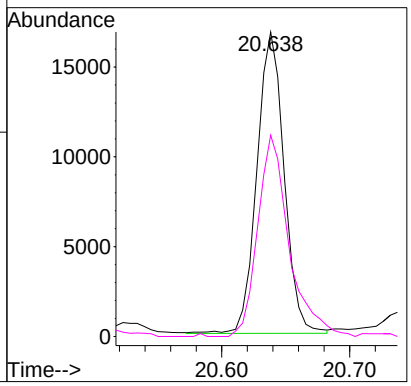




#91
d-Limonene
Concen: 0.88 ng
RT: 20.64 min Scan# 3119
Delta R.T. -0.006 min
Lab File: 11161917.D
Acq: 16 Nov 2019 12:31

Tgt Ion: 68 Resp: 24909

Ion	Ratio	Lower	Upper
68	100		
93	76.7	49.1	89.1



Response Factor Report GCMS-16

Method Path : I:\MS16\METHODS\
Method File : R16110719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Nov 07 14:29:49 2019
Response Via : Initial Calibration

LH 11/7/19

Calibration Files
0.1 =11071910.D 0.2 =11071911.D 0.5 =11071912.D 1.0 =11071913.D 5.0 =11071914.D 25 =11071
100 =11071917.D

		Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1)	IR	Bromochloromethane...	----------ISTD----------									
2)	T	Propene	2.229	2.012	2.120	2.408	2.321	2.057	2.066	1.682	2.112	10.51
3)	T	Dichlorodifluo...	3.102	2.901	2.833	2.710	2.716	2.415	2.201	1.883	2.595	15.48
4)	T	Chloromethane		2.604	2.123	1.540	1.700	1.688	1.077		1.789	29.19
5)	T	1,2-Dichloro-1...	1.439	1.411	1.400	1.376	1.343	1.202	1.124	0.997	1.287	12.47
6)	T	Vinyl Chloride	2.311	2.265	2.166	2.079	2.128	1.923	1.838	1.676	2.048	10.70
7)	T	1,3-Butadiene	1.792	1.546	1.530	1.512	1.613	1.602	1.487	1.280	1.545	9.28
8)	T	Bromomethane	1.466	1.327	1.292	1.223	1.253	1.169	1.120	1.008	1.232	11.25
9)	T	Chloroethane	1.225	1.132	1.103	1.097	1.109	1.035	1.011	0.955	1.083	7.63
10)	T	Ethanol	1.456	1.353	1.247	1.244	1.213	1.138	1.072	0.930	1.207	13.51
11)	T	Acetonitrile			3.189	3.117	3.044	2.955	2.932	2.787	3.004	4.78
12)	T	Acrolein	0.970	1.019	0.952	0.944	0.978	0.953	0.938	0.898	0.956	3.63
13)	T	Acetone	1.453	1.332	1.257	1.178	1.132	1.004	0.898	0.728	1.123	21.13
14)	T	Trichlorofluor...	2.561	2.409	2.378	2.294	2.304	2.069	1.958	1.775	2.218	11.80
15)	T	2-Propanol (Is...	4.015	3.934	3.542	2.875	3.130	3.196	2.651	2.312	3.207	18.71
16)	T	Acrylonitrile	1.944	1.928	2.035	2.091	2.138	2.069	2.034	1.907	2.018	4.14
17)	T	1,1-Dichloroet...	1.384	1.333	1.314	1.280	1.304	1.219	1.182	1.092	1.263	7.45
18)	T	2-Methyl-2-Pro...	2.642	2.413	2.282	2.380	2.536	2.550	2.411	1.205	2.302	19.87
19)	T	Methylene Chlo...	1.622	1.507	1.488	1.427	1.412	1.295	1.220	1.136	1.388	11.60
20)	T	3-Chloro-1-pro...	2.509	2.288	2.226	2.217	2.312	2.250	2.171	2.020	2.249	6.13
21)	T	Trichlorotrifl...	1.297	1.254	1.232	1.168	1.168	1.068	1.010	0.911	1.139	11.62
22)	T	Carbon Disulfide			5.286	5.366	5.382	4.863	4.566	4.071	4.922	10.73
23)	T	trans-1,2-Dich...	2.165	1.994	2.049	2.020	2.069	1.927	1.842	1.677	1.968	7.72
24)	T	1,1-Dichloroet...	2.954	2.709	2.641	2.565	2.569	2.385	2.289	2.100	2.526	10.48
25)	T	Methyl tert-Bu...	2.956	2.733	2.724	2.842	2.968	2.893	2.842	2.703	2.833	3.68
26)	T	Vinyl Acetate	0.158	0.164	0.170	0.185	0.254	0.271	0.255	0.212	0.209	21.89
27)	T	2-Butanone (MEK)	0.832	0.911	0.948	0.957	0.949	0.901	0.869	0.785	0.894	6.90
28)	T	cis-1,2-Dichlo...	2.191	2.111	2.050	1.993	2.011	1.868	1.786	1.618	1.953	9.54
29)	T	Diisopropyl Ether	1.400	1.339	1.275	1.274	1.283	1.147	0.885	0.685	1.161	21.40
30)	T	Ethyl Acetate	0.471	0.531	0.542	0.530	0.546	0.476	0.397	0.286	0.472	19.19
31)	T	n-Hexane	2.791	2.627	2.481	2.422	2.418	2.113	1.839	1.466	2.270	19.31
32)	T	Chloroform	2.676	2.476	2.397	2.328	2.301	2.003	1.830	1.600	2.201	16.33
33)	S	1,2-Dichloroet...	1.634	1.620	1.618	1.631	1.615	1.586	1.558	1.535	1.600	2.26
34)	T	Tetrahydrofura...	1.006	0.959	0.954	0.944	0.947	0.912	0.892	0.802	0.927	6.56
35)	T	Ethyl tert-But...	1.161	1.169	1.088	1.068	1.115	1.053	1.023	0.955	1.079	6.58
36)	T	1,2-Dichloroet...	1.978	1.835	1.785	1.749	1.750	1.618	1.555	1.436	1.713	9.95
37)	IR	1,4-Difluorobenzen...	----------ISTD----------									
38)	T	1,1,1-Trichlor...	0.506	0.471	0.465	0.449	0.467	0.441	0.427	0.393	0.452	7.46
39)	T	Isopropyl Acetate	0.212	0.218	0.222	0.221	0.235	0.221	0.205	0.171	0.213	9.02
40)	T	1-Butanol	0.237	0.262	0.285	0.305	0.315	0.317	0.282	0.211	0.277	13.73
41)	T	Benzene	1.609	1.508	1.388	1.335	1.323	1.144	1.022	0.791	1.265	21.11
42)	T	Carbon Tetrach...	0.362	0.354	0.358	0.369	0.397	0.387	0.373	0.342	0.368	4.86
43)	T	Cyclohexane	0.549	0.527	0.511	0.493	0.498	0.451	0.406	0.328	0.470	15.47
44)	T	tert-Amyl Meth...	0.730	0.695	0.651	0.644	0.664	0.645	0.632	0.586	0.656	6.52
45)	T	1,2-Dichloropr...	0.386	0.366	0.353	0.347	0.355	0.334	0.324	0.295	0.345	8.03
46)	T	Bromodichlorom...	0.427	0.414	0.410	0.408	0.429	0.408	0.392	0.352	0.405	6.07
47)	T	Trichloroethene	0.361	0.351	0.331	0.321	0.322	0.291	0.269	0.225	0.309	14.53
48)	T	1,4-Dioxane	0.252	0.264	0.263	0.264	0.217	0.241	0.222	0.187	0.239	11.74
49)	T	2,2,4-Trimethy...	1.668	1.585	1.530	1.486	1.485	1.293	1.166	0.953	1.396	17.18
50)	T	Methyl Methacr...	0.116	0.119	0.118	0.121	0.129	0.123	0.117	0.100	0.118	6.89
51)	T	n-Heptane	0.350	0.354	0.332	0.329	0.331	0.307	0.288	0.247	0.317	11.29
52)	T	cis-1,3-Dichlo...	0.452	0.457	0.457	0.448	0.502	0.528	0.518	0.472	0.484	6.74
53)	T	4-Methyl-2-pen...	0.294	0.296	0.313	0.324	0.328	0.312	0.286	0.240	0.299	9.33
54)	T	trans-1,3-Dich...			0.337	0.365	0.435	0.462	0.458	0.427	0.414	12.43

55)	T	1,1,2-Trichlor...	0.319	0.315	0.312	0.307	0.312	0.293	0.279	0.251	0.299	7.81
56)	IR	Chlorobenzene-d5 (...	----------ISTD----------									
57)	S	Toluene-d8 (SS2)	2.255	2.223	2.187	2.155	2.192	2.175	2.155	2.157	2.187	1.64
58)	T	Toluene			2.614	2.448	2.585	2.277	2.108	1.808	2.307	13.44
59)	T	2-Hexanone	1.408	1.465	1.554	1.558	1.631	1.641	1.553	1.355	1.521	6.73
60)	T	Dibromochlorom...	0.655	0.640	0.635	0.639	0.721	0.682	0.644	0.570	0.648	6.66
61)	T	1,2-Dibromoethane	0.711	0.698	0.664	0.653	0.710	0.670	0.637	0.570	0.664	7.04
62)	T	n-Butyl Acetate	1.698	1.669	1.669	1.680	1.865	1.895	1.808	1.588	1.734	6.26
63)	T	n-Octane	0.694	0.637	0.627	0.597	0.636	0.568	0.520	0.433	0.589	13.84
64)	T	Tetrachloroethene	0.844	0.779	0.735	0.697	0.735	0.644	0.588	0.493	0.689	16.15
65)	T	Chlorobenzene	1.939	1.786	1.655	1.561	1.636	1.501	1.712	1.187	1.622	13.68
66)	T	Ethylbenzene	3.325	3.100	2.966	2.848	3.040	2.692	2.446	2.038	2.807	14.56
67)	T	m- & p-Xylenes	2.598	2.442	2.327	2.230	2.284	1.935	1.679	1.310	2.101	20.48
68)	T	Bromoform	0.471	0.478	0.479	0.488	0.568	0.526	0.474	0.388	0.484	10.57
69)	T	Styrene	1.757	1.683	1.660	1.670	1.827	1.663	1.509	1.250	1.627	10.91
70)	T	o-Xylene		2.451	2.344	2.256	2.288	1.844	1.562	1.189	1.991	23.77
71)	T	n-Nonane	1.721	1.594	1.529	1.487	1.581	1.366	1.201	0.916	1.424	18.14
72)	T	1,1,2,2-Tetrac...	1.248	1.189	1.167	1.131	1.181	1.003	0.881	0.696	1.062	17.83
73)	S	Bromofluoroben...	0.756	0.760	0.802	0.849	0.778	0.765	0.765	0.775	0.781	3.95
74)	T	Cumene		3.111	2.929	2.805	2.920	2.527	2.237	1.791	2.617	17.80
75)	T	alpha-Pinene	1.492	1.386	1.371	1.335	1.433	1.262	1.135	0.932	1.293	14.07
76)	T	n-Propylbenzene	3.967	3.718	3.642	3.527	3.632	3.055	2.660	2.080	3.285	19.44
77)	T	3-Ethyltoluene		2.974	2.949	2.862	2.946	2.415	2.039	1.634	2.546	20.98
78)	T	4-Ethyltoluene		2.870	2.771	2.646	2.667	2.208	1.869	1.324	2.336	24.33
79)	T	1,3,5-Trimethy...	2.730	2.493	2.398	2.329	2.338	1.927	1.652	1.265	2.142	22.77
80)	T	alpha-Methylst...	1.140	1.095	1.118	1.149	1.234	1.108	0.976	0.753	1.072	13.72
81)	T	2-Ethyltoluene			2.917	2.784	2.765	2.194	1.803	1.307	2.295	28.07
82)	T	1,2,4-Trimethy...	2.579	2.469	2.415	2.336	2.361	1.893	1.506	1.121	2.085	25.25
83)	T	n-Decane	1.657	1.514	1.493	1.453	1.476	1.203	0.995	0.693	1.311	24.71
84)	T	Benzyl Chloride				0.911	1.435	1.542	1.352	1.003	1.249	22.15
85)	T	1,3-Dichlorobe...	1.604	1.475	1.422	1.337	1.334	1.076	0.892	0.625	1.221	27.04
86)	T	1,4-Dichlorobe...	1.649	1.485	1.416	1.351	1.329	1.123	0.951	0.701	1.250	24.66
87)	T	sec-Butylbenzene			3.311	3.165	3.151	2.479	2.009	1.418	2.589	29.36
88)	T	4-Isopropyltol...		3.054	2.979	2.880	2.920	2.237	1.716	1.285	2.439	28.95
89)	T	1,2,3-Trimethy...	2.689	2.514	2.433	2.334	2.356	1.859	1.445	1.087	2.090	27.20
90)	T	1,2-Dichlorobe...	1.546	1.433	1.395	1.303	1.303	1.093	0.898	0.645	1.202	25.25
91)	T	d-Limonene	0.912	0.927	0.952	0.933	0.956	0.731	0.539	0.334	0.785	29.74
92)	T	1,2-Dibromo-3-...	0.402	0.407	0.429	0.434	0.477	0.469	0.435	0.361	0.427	8.78
93)	T	n-Undecane	1.480	1.390	1.415	1.412	1.582	1.413	1.218	0.900	1.351	15.44
94)	T	1,2,4-Trichlor...	0.958	0.924	0.896	0.885	0.934	0.937	0.840	0.667	0.880	10.64
95)	T	Naphthalene	2.819	2.724	2.755	2.716	2.917	2.718	2.182	1.618	2.556	17.11
96)	T	n-Dodecane	1.116	1.080	1.156	1.180	1.476	1.174	0.858	0.568	1.076	24.69
97)	T	Hexachlorobuta...	0.743	0.681	0.659	0.628	0.648	0.585	0.517	0.399	0.607	17.70
98)	T	Cyclohexanone	1.008	0.955	0.945	0.928	0.794	0.914	0.826	0.691	0.883	11.77
99)	T	tert-Butylbenzene	2.642	2.467	2.391	2.282	2.304	1.818	1.429	1.087	2.052	26.86
100)	T	n-Butylbenzene	2.771	2.622	2.654	2.591	2.696	2.299	1.978	1.523	2.392	18.24

(#) = Out of Range

R16110719.M Thu Nov 07 17:07:21 2019

Primary Source Standards Concentrations (Working & Initial Calibration)

LH 11/7/19

1ng/L Std. ID:
4ng/L Std. ID: S31-11061902
20ng/L Std. ID: S31-11051904
200ng/L Std. ID: S31-10301901

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):	4	4	4	4	20	200	200	200
	Source Std.	Primary Working Standards				Injection (L):	0.025	0.050	0.125	0.250	0.25	0.125	0.25	0.50
Compounds	mg/m^3	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
Propene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Dichlorodifluoromethane	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Chloromethane	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Freon-114	1.05	210	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Vinyl Chloride	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3-Butadiene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Bromomethane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Chloroethane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Ethanol	5.21	1042	104.2	20.84	5.21		0.521	1.042	2.605	5.21	26.05	130.25	260.5	521
Acetonitrile	1.05	210	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Acrolein	1.03	206	20.6	4.12	1.03		0.103	0.206	0.515	1.03	5.15	25.75	51.5	103
Acetone	5.33	1066	106.6	21.32	5.33		0.533	1.066	2.665	5.33	26.65	133.25	266.5	533
Trichlorofluoromethane	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Isopropanol	2.10	420	42.0	8.40	2.10		0.210	0.420	1.050	2.10	10.50	52.50	105.0	210
Acrylonitrile	1.05	210	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
1,1-Dichloroethene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
tert-Butanol	2.16	432	43.2	8.64	2.16		0.216	0.432	1.080	2.16	10.80	54.00	108.0	216
Methylene Chloride	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Allyl Chloride	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Trichlorotrifluoroethane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Carbon Disulfide	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
trans-1,2-Dichloroethene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,1-Dichloroethane	1.09	218	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
Methyl tert-Butyl Ether	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Vinyl Acetate	5.35	1070	107.0	21.40	5.35		0.535	1.070	2.675	5.35	26.75	133.75	267.5	535
2-Butanone	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
cis-1,2-Dichloroethene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Diisopropyl Ether	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Ethyl Acetate	2.17	434	43.4	8.68	2.17		0.217	0.434	1.085	2.17	10.85	54.25	108.5	217
n-Hexane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Chloroform	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Tetrahydrofuran	1.09	218	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
Ethyl tert-Butyl Ether	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dichloroethane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,1,1-Trichloroethane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Isopropyl Acetate	2.11	422	42.2	8.44	2.11		0.211	0.422	1.055	2.11	10.55	52.75	105.5	211
1-Butanol	2.08	416	41.6	8.32	2.08		0.208	0.416	1.040	2.08	10.40	52.00	104.0	208
Benzene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Carbon Tetrachloride	1.05	210	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
Cyclohexane	2.12	424	42.4	8.48	2.12		0.212	0.424	1.060	2.12	10.60	53.00	106.0	212
tert-Amyl Methyl Ether	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dichloropropane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Bromodichloromethane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Trichloroethene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,4-Dioxane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Isooctane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Methyl Methacrylate	2.15	430	43.0	8.60	2.15		0.215	0.430	1.075	2.15	10.75	53.75	107.5	215
n-Heptane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108

Q:\TO15 Std. Concentrations\MS16 Std. Conc\2019\R16110719\ICAL Conc. (Primary Source)

Date Updated: 10/15/19
Version: 0

Primary Source Standards Concentrations (Working & Initial Calibration)

LH 11/7/19

1ng/L Std. ID:
4ng/L Std. ID: S31-11061902
20ng/L Std. ID: S31-11051904
200ng/L Std. ID: S31-10301901

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):	4	4	4	4	20	200	200	200
	Source Std.	Primary Working Standards				Injection (L):	0.025	0.050	0.125	0.250	0.25	0.125	0.25	0.50
Compounds	mg/m^3	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
cis-1,3-Dichloropropene	1.04	208	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
4-Methyl-2-pentanone	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
trans-1,3-Dichloropropene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
1,1,2-Trichloroethane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Toluene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
2-Hexanone	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Dibromochloromethane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,2-Dibromoethane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Butyl Acetate	1.09	218	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
n-Octane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
Tetrachloroethene	1.04	208	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
Chlorobenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Ethylbenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
m-&p-Xylene	2.14	428	42.8	8.56	2.14		0.214	0.428	1.070	2.14	10.70	53.50	107.0	214
Bromoform	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Styrene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
o-Xylene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Nonane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,1,2,2-Tetrachloroethane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Cumene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
alpha-Pinene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Propylbenzene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
3-Ethyltoluene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
4-Ethyltoluene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3,5-Trimethylbenzene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
alpha-Methylstyrene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
2-Ethyltoluene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2,4-Trimethylbenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Decane	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Benzyl Chloride	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,3-Dichlorobenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
1,4-Dichlorobenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
sec-Butylbenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
p-Isopropyltoluene	1.09	218	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
1,2,3-Trimethylbenzene	1.09	218	21.8	4.36	1.09		0.109	0.218	0.545	1.09	5.45	27.25	54.5	109
1,2-Dichlorobenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
d-Limonene	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2-Dibromo-3-chloropropane	1.05	210	21.0	4.20	1.05		0.105	0.210	0.525	1.05	5.25	26.25	52.5	105
n-Undecane	1.08	216	21.6	4.32	1.08		0.108	0.216	0.540	1.08	5.40	27.00	54.0	108
1,2,4-Trichlorobenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
Naphthalene	1.03	206	20.6	4.12	1.03		0.103	0.206	0.515	1.03	5.15	25.75	51.5	103
n-Dodecane	1.04	208	20.8	4.16	1.04		0.104	0.208	0.520	1.04	5.20	26.00	52.0	104
Hexachloro-1,3-butadiene	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Methacrylonitrile	1.06	212	21.2	4.24	1.06		0.106	0.212	0.530	1.06	5.30	26.50	53.0	106
Cyclohexanone	1.00	200	20.0	4.00	1.00		0.100	0.200	0.500	1.00	5.00	25.00	50.0	100
tert-Butylbenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107
n-Butylbenzene	1.07	214	21.4	4.28	1.07		0.107	0.214	0.535	1.07	5.35	26.75	53.5	107

Calibration Status Report GCMS-16

Method : I:\MS16\METHODS\R16110719.M (RTE Integrator)
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS16\DATA\2019_11\07\11071910.D
2	0.2	0	13	I:\MS16\DATA\2019_11\07\11071911.D
3	0.5	1	13	I:\MS16\DATA\2019_11\07\11071912.D
4	1.0	1	13	I:\MS16\DATA\2019_11\07\11071913.D
5	5.0	5	13	I:\MS16\DATA\2019_11\07\11071914.D
6	25	27	13	I:\MS16\DATA\2019_11\07\11071915.D
7	50	53	13	I:\MS16\DATA\2019_11\07\11071916.D
8	100	106	13	I:\MS16\DATA\2019_11\07\11071917.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Nov 07 14:29 2019	Nov 07 14:19 2019	7 Nov 2019 9:52
2	0.2	Nov 07 14:29 2019	Nov 07 14:19 2019	7 Nov 2019 10:25
3	0.5	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 10:58
4	1.0	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 11:31
5	5.0	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 12:04
6	25	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 12:37
7	50	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 13:10
8	100	Nov 07 14:29 2019	Nov 07 14:20 2019	7 Nov 2019 13:43

R16110719.M Thu Nov 07 17:08:20 2019

LH 11/7/19

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071910.D
Acq On : 7 Nov 2019 9:52 Operator: LH
Sample : 0.1ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:57 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	240419	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	1060511	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	499170	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.02	65	392835	11.615	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.96%				
57) Toluene-d8 (SS2)	15.74	98	1125583	12.481	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%				
73) Bromofluorobenzene (SS3)	19.01	174	377312	12.306	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.48%				
Target Compounds							Qvalue
2) Propene	4.16	42	4545	0.124	ng		98
3) Dichlorodifluoromethan...	4.31	85	6324	0.114	ng		98
4) Chloromethane	4.59	50	5746	0.137	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.85	135	2907	0.090	ng		99
6) Vinyl Chloride	5.00	62	4801	0.103	ng		96
7) 1,3-Butadiene	5.27	54	3654	0.108	ng		95
8) Bromomethane	5.69	94	3045	0.124	ng		98
9) Chloroethane	6.03	64	2545	0.133	ng		95
10) Ethanol	6.35	45	14591	0.648	ng		95
11) Acetonitrile	6.62	41	7195	0.138	ng		93
12) Acrolein	6.84	56	1922	0.106	ng		94
13) Acetone	7.04	58	14896	0.635	ng		94
14) Trichlorofluoromethane	7.28	101	5222	0.105	ng		100
15) 2-Propanol (Isopropanol)	7.55	45	16217	0.254	ng		88
16) Acrylonitrile	7.78	53	3925	0.105	ng		95
17) 1,1-Dichloroethene	8.24	96	2875	0.115	ng		94
18) 2-Methyl-2-Propanol (t...	8.44	59	10975	0.321	ng		89
19) Methylene Chloride	8.44	84	3306	0.122	ng		92
20) 3-Chloro-1-propene (Al...	8.62	41	5212	0.130	ng		89
21) Trichlorotrifluoroethane	8.87	151	2695	0.115	ng		93
22) Carbon Disulfide	8.72	76	12436	0.128	ng		96
23) trans-1,2-Dichloroethene	9.72	61	4498	0.117	ng		97
24) 1,1-Dichloroethane	9.96	63	6193	0.128	ng		97
25) Methyl tert-Butyl Ether	10.11	73	6141	0.156	ng		96
26) Vinyl Acetate	10.23	86	1628	0.288	ng	#	44
27) 2-Butanone (MEK)	10.51	72	1696	0.089	ng	#	40
28) cis-1,2-Dichloroethene	10.98	61	4467	0.115	ng		99
29) Diisopropyl Ether	11.31	87	2909	0.116	ng	#	87
30) Ethyl Acetate	11.32	61	1967	0.195	ng		97
31) n-Hexane	11.28	57	5798	0.124	ng	#	95
32) Chloroform	11.33	83	5508	0.116	ng		99
34) Tetrahydrofuran (THF)	11.77	72	2110	0.114	ng	#	86
35) Ethyl tert-Butyl Ether	11.90	87	2411	0.180	ng		91
36) 1,2-Dichloroethane	12.13	62	4108	0.105	ng		98
38) 1,1,1-Trichloroethane	12.42	97	4591	0.105	ng		99
39) Isopropyl Acetate	12.87	61	3799	0.198	ng	#	81
40) 1-Butanol	12.90	56	4181	0.151	ng	#	66
41) Benzene	12.90	78	14468	0.129	ng		99
42) Carbon Tetrachloride	13.06	117	3227	0.091	ng		97
43) Cyclohexane	13.19	84	9871	0.236	ng		95
44) tert-Amyl Methyl Ether	13.56	73	6685	0.192	ng		95
45) 1,2-Dichloropropane	13.75	63	3536	0.124	ng		99
46) Bromodichloromethane	13.94	83	3913	0.104	ng		100
47) Trichloroethene	14.00	130	3273	0.116	ng		99
48) 1,4-Dioxane	14.00	88	2313	0.104	ng		88
49) 2,2,4-Trimethylpentane...	14.07	57	15139	0.133	ng		98

Data File: I:\MS16\DATA\2019_11\07\11071910.D
Acq On : 7 Nov 2019 9:52 Operator: LH
Sample : 0.1ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:57 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

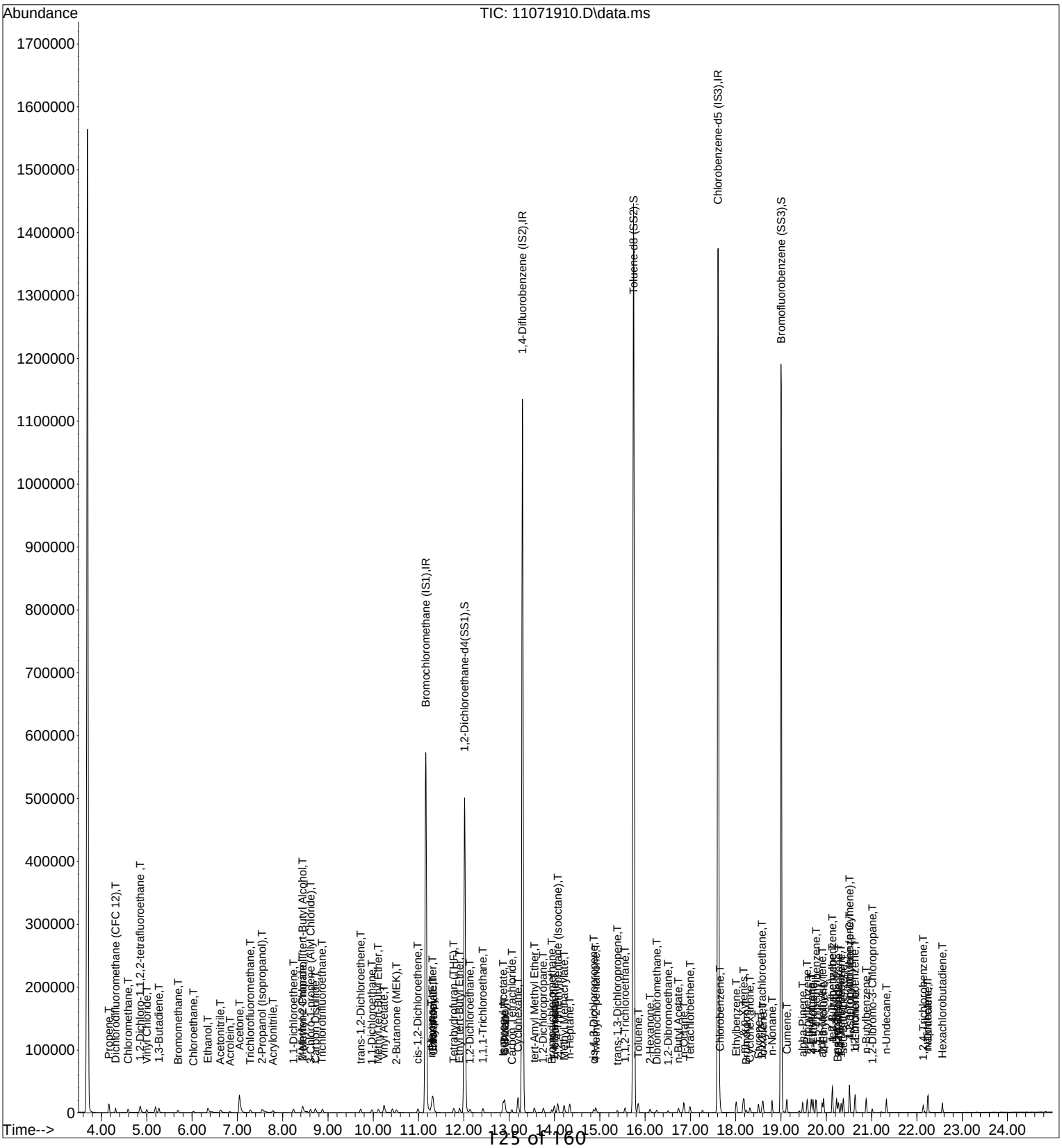
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
50) Methyl Methacrylate	14.22	100	2121	0.197	ng		100
51) n-Heptane	14.34	71	3210	0.118	ng		90
52) cis-1,3-Dichloropropene	14.86	75	3990	0.091	ng		96
53) 4-Methyl-2-pentanone	14.91	58	2640	0.101	ng		85
54) trans-1,3-Dichloropropene	15.39	75	2677	0.073	ng		91
55) 1,1,2-Trichloroethane	15.56	97	2896	0.110	ng		95
58) Toluene	15.85	91	13140	0.117	ng		99
59) 2-Hexanone	16.11	43	6018	0.086	ng		89
60) Dibromochloromethane	16.26	129	2798	0.094	ng		95
61) 1,2-Dibromoethane	16.51	107	3040	0.102	ng		99
62) n-Butyl Acetate	16.73	43	7393	0.098	ng		95
63) n-Octane	16.86	57	2993	0.126	ng		97
64) Tetrachloroethene	16.99	166	3504	0.115	ng		100
65) Chlorobenzene	17.65	112	8287	0.112	ng		98
66) Ethylbenzene	18.01	91	14206	0.114	ng		99
67) m- & p-Xylenes	18.17	91	22203	0.234	ng		100
68) Bromoform	18.23	173	2013	0.087	ng		97
69) Styrene	18.50	104	7438	0.097	ng		99
70) o-Xylene	18.60	91	11069	0.120	ng		98
71) n-Nonane	18.80	43	7354	0.126	ng		95
72) 1,1,2,2-Tetrachloroethane	18.58	83	5331	0.114	ng		98
74) Cumene	19.13	105	14568	0.121	ng		99
75) alpha-Pinene	19.48	93	6377	0.146	ng		87
76) n-Propylbenzene	19.58	91	17109	0.117	ng		99
77) 3-Ethyltoluene	19.67	105	13645	0.117	ng		98
78) 4-Ethyltoluene	19.71	105	13415	0.125	ng		98
79) 1,3,5-Trimethylbenzene	19.77	105	11558	0.121	ng		97
80) alpha-Methylstyrene	19.91	118	4869	0.102	ng		92
81) 2-Ethyltoluene	19.94	105	13712	0.125	ng		98
82) 1,2,4-Trimethylbenzene	20.13	105	11019	0.116	ng		97
83) n-Decane	20.23	57	7080	0.133	ng		94
84) Benzyl Chloride	20.25	91	3276	0.048	ng		89
85) 1,3-Dichlorobenzene	20.27	146	6855	0.127	ng		96
86) 1,4-Dichlorobenzene	20.32	146	7045	0.127	ng		97
87) sec-Butylbenzene	20.37	105	15548	0.126	ng		98
88) 4-Isopropyltoluene (p-...	20.51	119	14535	0.120	ng		98
89) 1,2,3-Trimethylbenzene	20.51	105	11704	0.123	ng		98
90) 1,2-Dichlorobenzene	20.63	146	6606	0.123	ng		97
91) d-Limonene	20.64	68	3935	0.118	ng		98
92) 1,2-Dibromo-3-Chloropr...	21.02	157	1686	0.085	ng	#	66
93) n-Undecane	21.33	57	6385	0.117	ng		98
94) 1,2,4-Trichlorobenzene	22.14	180	4095	0.111	ng		97
95) Naphthalene	22.24	128	11596	0.102	ng		97
96) n-Dodecane	22.24	57	4636	0.097	ng		93
97) Hexachlorobutadiene	22.56	225	3144	0.136	ng		97
98) Cyclohexanone	18.31	55	4027	0.097	ng		98
99) tert-Butylbenzene	20.13	119	11291	0.122	ng		98
100) n-Butylbenzene	20.88	91	11840	0.112	ng		97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071910.D
Acq On : 7 Nov 2019 9:52 Operator: LH
Sample : 0.1ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:57 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071911.D
Acq On : 7 Nov 2019 10:25 Operator: LH
Sample : 0.2ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:59 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	242657	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	1052869	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	509393	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.02	65	393044	11.514	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.08%				
57) Toluene-d8 (SS2)	15.74	98	1132544	12.306	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.48%				
73) Bromofluorobenzene (SS3)	19.01	174	387353	12.380	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.04%				
Target Compounds							Qvalue
2) Propene	4.15	42	8281	0.224	ng		97
3) Dichlorodifluoromethan...	4.30	85	11941	0.213	ng		99
4) Chloromethane	4.58	50	10715	0.254	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.85	135	5754	0.176	ng		98
6) Vinyl Chloride	4.99	62	9496	0.201	ng		99
7) 1,3-Butadiene	5.26	54	6361	0.186	ng		96
8) Bromomethane	5.69	94	5564	0.225	ng		99
9) Chloroethane	6.02	64	4747	0.246	ng		100
10) Ethanol	6.34	45	27378	1.205	ng		97
11) Acetonitrile	6.61	41	13662	0.259	ng		84
12) Acrolein	6.82	56	4073	0.223	ng		95
13) Acetone	7.03	58	27557	1.165	ng		95
14) Trichlorofluoromethane	7.28	101	9914	0.198	ng		100
15) 2-Propanol (Isopropanol)	7.53	45	32072	0.497	ng		90
16) Acrylonitrile	7.77	53	7860	0.208	ng		98
17) 1,1-Dichloroethene	8.23	96	5590	0.222	ng		94
18) 2-Methyl-2-Propanol (t...	8.44	59	20236	0.587	ng		90
19) Methylene Chloride	8.44	84	6200	0.226	ng		94
20) 3-Chloro-1-propene (Al...	8.61	41	9594	0.237	ng		95
21) Trichlorotrifluoroethane	8.88	151	5258	0.223	ng		98
22) Carbon Disulfide	8.72	76	23132	0.235	ng		98
23) trans-1,2-Dichloroethene	9.72	61	8361	0.216	ng		98
24) 1,1-Dichloroethane	9.97	63	11466	0.236	ng		100
25) Methyl tert-Butyl Ether	10.10	73	11458	0.287	ng		98
26) Vinyl Acetate	10.23	86	3415	0.598	ng	#	67
27) 2-Butanone (MEK)	10.50	72	3748	0.196	ng	#	67
28) cis-1,2-Dichloroethene	10.99	61	8687	0.222	ng		95
29) Diisopropyl Ether	11.30	87	5613	0.222	ng	#	89
30) Ethyl Acetate	11.31	61	4470	0.439	ng		93
31) n-Hexane	11.28	57	11015	0.234	ng		98
32) Chloroform	11.33	83	10287	0.214	ng		99
34) Tetrahydrofuran (THF)	11.76	72	4059	0.218	ng		93
35) Ethyl tert-Butyl Ether	11.90	87	4901	0.362	ng		99
36) 1,2-Dichloroethane	12.14	62	7695	0.195	ng		99
38) 1,1,1-Trichloroethane	12.42	97	8498	0.196	ng		97
39) Isopropyl Acetate	12.86	61	7761	0.408	ng	#	89
40) 1-Butanol	12.89	56	9196	0.335	ng	#	74
41) Benzene	12.90	78	26936	0.242	ng		99
42) Carbon Tetrachloride	13.06	117	6266	0.178	ng		100
43) Cyclohexane	13.19	84	18804	0.453	ng		97
44) tert-Amyl Methyl Ether	13.55	73	12637	0.366	ng		95
45) 1,2-Dichloropropane	13.75	63	6666	0.236	ng		100
46) Bromodichloromethane	13.94	83	7526	0.202	ng		99
47) Trichloroethene	14.00	130	6323	0.225	ng		100
48) 1,4-Dioxane	13.98	88	4803	0.218	ng		94
49) 2,2,4-Trimethylpentane...	14.07	57	28576	0.252	ng		98

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071911.D
Acq On : 7 Nov 2019 10:25 Operator: LH
Sample : 0.2ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:59 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

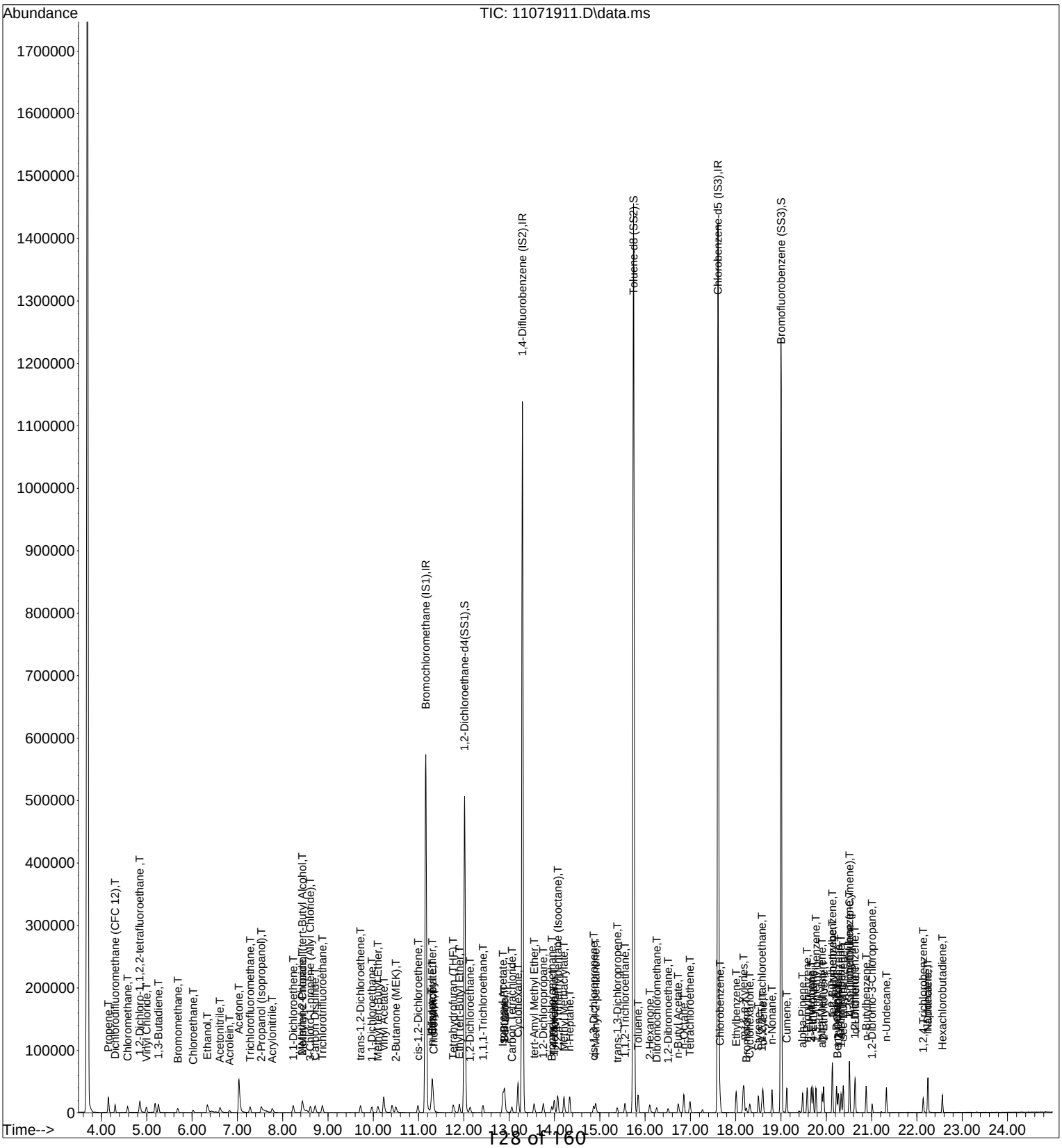
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
50) Methyl Methacrylate	14.21	100	4326	0.405	ng		98
51) n-Heptane	14.34	71	6440	0.239	ng		97
52) cis-1,3-Dichloropropene	14.86	75	7998	0.185	ng		97
53) 4-Methyl-2-pentanone	14.91	58	5282	0.204	ng		86
54) trans-1,3-Dichloropropene	15.39	75	5531	0.152	ng		99
55) 1,1,2-Trichloroethane	15.56	97	5684	0.217	ng		96
58) Toluene	15.84	91	24321	0.213	ng		99
59) 2-Hexanone	16.10	43	12779	0.179	ng		94
60) Dibromochloromethane	16.26	129	5578	0.185	ng		99
61) 1,2-Dibromoethane	16.51	107	6091	0.200	ng		99
62) n-Butyl Acetate	16.73	43	14828	0.193	ng		96
63) n-Octane	16.86	57	5610	0.231	ng		97
64) Tetrachloroethene	16.99	166	6601	0.213	ng		100
65) Chlorobenzene	17.65	112	15579	0.207	ng		100
66) Ethylbenzene	18.01	91	27031	0.213	ng		100
67) m- & p-Xylenes	18.17	91	42599	0.439	ng		99
68) Bromoform	18.24	173	4168	0.176	ng		98
69) Styrene	18.50	104	14536	0.186	ng		99
70) o-Xylene	18.60	91	21373	0.227	ng		99
71) n-Nonane	18.80	43	13898	0.233	ng		96
72) 1,1,2,2-Tetrachloroethane	18.58	83	10367	0.217	ng		97
74) Cumene	19.13	105	27381	0.223	ng		99
75) alpha-Pinene	19.48	93	12083	0.272	ng		85
76) n-Propylbenzene	19.58	91	32730	0.220	ng		98
77) 3-Ethyltoluene	19.67	105	25696	0.216	ng		99
78) 4-Ethyltoluene	19.70	105	25262	0.230	ng		99
79) 1,3,5-Trimethylbenzene	19.77	105	21541	0.221	ng		99
80) alpha-Methylstyrene	19.91	118	9552	0.197	ng		88
81) 2-Ethyltoluene	19.94	105	25869	0.230	ng		99
82) 1,2,4-Trimethylbenzene	20.13	105	21535	0.223	ng		99
83) n-Decane	20.23	57	13204	0.243	ng		98
84) Benzyl Chloride	20.25	91	6302	0.091	ng		94
85) 1,3-Dichlorobenzene	20.27	146	12865	0.233	ng		99
86) 1,4-Dichlorobenzene	20.32	146	12954	0.229	ng		99
87) sec-Butylbenzene	20.37	105	29565	0.234	ng		98
88) 4-Isopropyltoluene (p-...	20.51	119	27129	0.220	ng		100
89) 1,2,3-Trimethylbenzene	20.51	105	22335	0.231	ng		99
90) 1,2-Dichlorobenzene	20.63	146	12495	0.228	ng		100
91) d-Limonene	20.64	68	8156	0.239	ng		95
92) 1,2-Dibromo-3-Chloropr...	21.01	157	3482	0.172	ng	#	75
93) n-Undecane	21.33	57	12235	0.219	ng		98
94) 1,2,4-Trichlorobenzene	22.14	180	8062	0.214	ng		100
95) Naphthalene	22.24	128	22866	0.197	ng		99
96) n-Dodecane	22.24	57	9154	0.187	ng		95
97) Hexachlorobutadiene	22.56	225	5886	0.250	ng		100
98) Cyclohexanone	18.31	55	7783	0.184	ng		99
99) tert-Butylbenzene	20.13	119	21513	0.228	ng		98
100) n-Butylbenzene	20.88	91	22869	0.212	ng		99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071911.D
Acq On : 7 Nov 2019 10:25 Operator: LH
Sample : 0.2ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:19:59 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071912.D
Acq On : 7 Nov 2019 10:58 Operator: LH
Sample : 0.5ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:01 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019 LH 11/7/19
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	237781	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	1031641	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	509323	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.02	65	384738	11.502	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.00%				
57) Toluene-d8 (SS2)	15.74	98	1113757	12.103	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.80%				
73) Bromofluorobenzene (SS3)	19.01	174	408502	13.057	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.48%				
Target Compounds							Qvalue
2) Propene	4.14	42	21376	0.591	ng		100
3) Dichlorodifluoromethan...	4.29	85	28562	0.520	ng		100
4) Chloromethane	4.56	50	21408	0.518	ng		98
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	13982	0.438	ng		99
6) Vinyl Chloride	4.98	62	22248	0.481	ng		100
7) 1,3-Butadiene	5.25	54	15430	0.461	ng		99
8) Bromomethane	5.67	94	13268	0.547	ng		99
9) Chloroethane	6.01	64	11326	0.599	ng		98
10) Ethanol	6.32	45	61786	2.775	ng		99
11) Acetonitrile	6.60	41	31847	0.616	ng		95
12) Acrolein	6.81	56	9327	0.520	ng		99
13) Acetone	7.02	58	63740	2.749	ng		97
14) Trichlorofluoromethane	7.28	101	23970	0.488	ng		97
15) 2-Propanol (Isopropanol)	7.50	45	70748	1.119	ng		90
16) Acrylonitrile	7.77	53	20325	0.550	ng		99
17) 1,1-Dichloroethene	8.23	96	13502	0.546	ng		99
18) 2-Methyl-2-Propanol (t...	8.40	59	46881	1.388	ng		90
19) Methylene Chloride	8.44	84	14997	0.557	ng		98
20) 3-Chloro-1-propene (Al...	8.61	41	22863	0.576	ng		97
21) Trichlorotrifluoroethane	8.87	151	12655	0.548	ng		99
22) Carbon Disulfide	8.71	76	53796	0.559	ng		99
23) trans-1,2-Dichloroethene	9.71	61	21049	0.554	ng		99
24) 1,1-Dichloroethane	9.97	63	27375	0.574	ng		99
25) Methyl tert-Butyl Ether	10.09	73	27983	0.716	ng		100
26) Vinyl Acetate	10.23	86	8673	1.550	ng	#	72
27) 2-Butanone (MEK)	10.48	72	9558	0.510	ng		94
28) cis-1,2-Dichloroethene	10.99	61	20666	0.540	ng		99
29) Diisopropyl Ether	11.30	87	13095	0.530	ng	#	84
30) Ethyl Acetate	11.30	61	11181	1.121	ng		96
31) n-Hexane	11.28	57	25483	0.553	ng		98
32) Chloroform	11.33	83	24396	0.518	ng		100
34) Tetrahydrofuran (THF)	11.75	72	9890	0.541	ng		95
35) Ethyl tert-Butyl Ether	11.89	87	11173	0.843	ng		96
36) 1,2-Dichloroethane	12.14	62	18337	0.475	ng		99
38) 1,1,1-Trichloroethane	12.42	97	20527	0.483	ng		99
39) Isopropyl Acetate	12.86	61	19364	1.039	ng	#	93
40) 1-Butanol	12.88	56	24456	0.909	ng		84
41) Benzene	12.90	78	60731	0.556	ng		99
42) Carbon Tetrachloride	13.06	117	15508	0.449	ng		99
43) Cyclohexane	13.19	84	44716	1.100	ng		97
44) tert-Amyl Methyl Ether	13.54	73	29027	0.859	ng		96
45) 1,2-Dichloropropane	13.75	63	15710	0.567	ng		100
46) Bromodichloromethane	13.94	83	18277	0.500	ng		98
47) Trichloroethene	14.00	130	14626	0.532	ng		100
48) 1,4-Dioxane	13.98	88	11707	0.542	ng		93
49) 2,2,4-Trimethylpentane...	14.07	57	67548	0.608	ng		99

Data File: I:\MS16\DATA\2019_11\07\11071912.D
Acq On : 7 Nov 2019 10:58 Operator: LH
Sample : 0.5ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:01 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

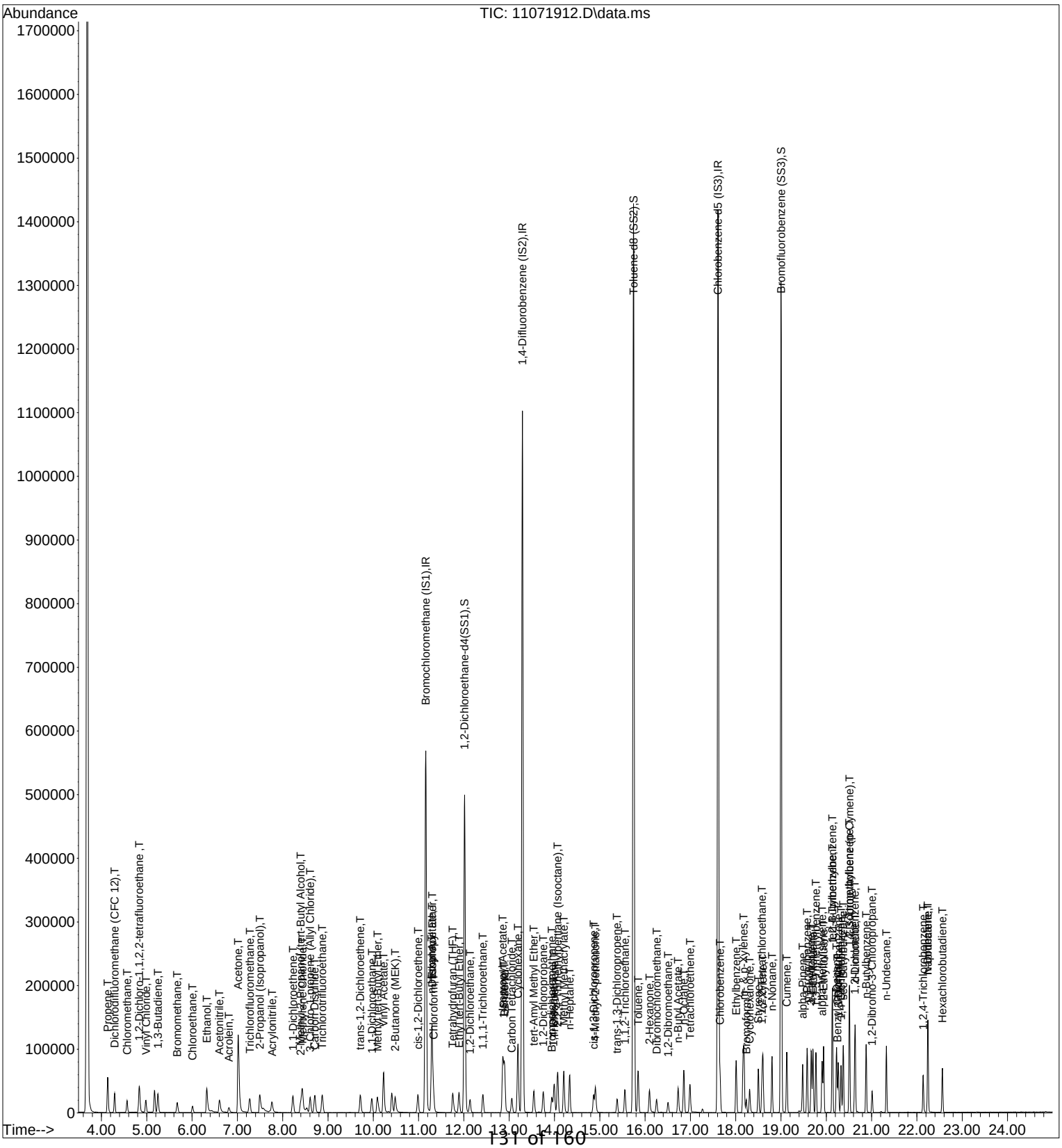
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	10434	0.998	ng	92
51) n-Heptane	14.34	71	14778	0.560	ng	99
52) cis-1,3-Dichloropropene	14.86	75	19623	0.462	ng	99
53) 4-Methyl-2-pentanone	14.90	58	13684	0.540	ng	90
54) trans-1,3-Dichloropropene	15.38	75	14736	0.414	ng	98
55) 1,1,2-Trichloroethane	15.56	97	13789	0.538	ng	98
58) Toluene	15.85	91	56991	0.498	ng	100
59) 2-Hexanone	16.10	43	33877	0.475	ng	95
60) Dibromochloromethane	16.26	129	13850	0.458	ng	99
61) 1,2-Dibromoethane	16.51	107	14478	0.476	ng	100
62) n-Butyl Acetate	16.73	43	37058	0.482	ng	99
63) n-Octane	16.86	57	13794	0.569	ng	96
64) Tetrachloroethene	16.99	166	15583	0.503	ng	98
65) Chlorobenzene	17.65	112	36077	0.480	ng	100
66) Ethylbenzene	18.01	91	64652	0.510	ng	99
67) m- & p-Xylenes	18.17	91	101468	1.047	ng	100
68) Bromoform	18.24	173	10447	0.441	ng	99
69) Styrene	18.50	104	35855	0.458	ng	99
70) o-Xylene	18.60	91	51104	0.543	ng	99
71) n-Nonane	18.80	43	33324	0.559	ng	98
72) 1,1,2,2-Tetrachloroethane	18.58	83	25430	0.532	ng	100
74) Cumene	19.13	105	64442	0.525	ng	99
75) alpha-Pinene	19.48	93	29889	0.672	ng	91
76) n-Propylbenzene	19.58	91	80136	0.538	ng	98
77) 3-Ethyltoluene	19.67	105	63680	0.535	ng	99
78) 4-Ethyltoluene	19.70	105	60969	0.556	ng	98
79) 1,3,5-Trimethylbenzene	19.77	105	51796	0.531	ng	100
80) alpha-Methylstyrene	19.91	118	24365	0.503	ng	92
81) 2-Ethyltoluene	19.94	105	64182	0.571	ng	98
82) 1,2,4-Trimethylbenzene	20.13	105	52646	0.544	ng	99
83) n-Decane	20.23	57	32540	0.598	ng	97
84) Benzyl Chloride	20.25	91	16184	0.233	ng	95
85) 1,3-Dichlorobenzene	20.26	146	30998	0.562	ng	99
86) 1,4-Dichlorobenzene	20.32	146	30866	0.546	ng	100
87) sec-Butylbenzene	20.37	105	72180	0.571	ng	98
88) 4-Isopropyltoluene (p-...	20.51	119	66150	0.536	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	54026	0.558	ng	99
90) 1,2-Dichlorobenzene	20.63	146	30412	0.556	ng	100
91) d-Limonene	20.64	68	20944	0.615	ng	95
92) 1,2-Dibromo-3-Chloropr...	21.01	157	9172	0.453	ng	80
93) n-Undecane	21.33	57	31135	0.558	ng	99
94) 1,2,4-Trichlorobenzene	22.14	180	19532	0.519	ng	99
95) Naphthalene	22.24	128	57806	0.499	ng	99
96) n-Dodecane	22.24	57	24503	0.500	ng	96
97) Hexachlorobutadiene	22.56	225	14241	0.605	ng	99
98) Cyclohexanone	18.31	55	19244	0.455	ng	97
99) tert-Butylbenzene	20.13	119	52114	0.553	ng	100
100) n-Butylbenzene	20.88	91	57856	0.537	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071912.D
Acq On : 7 Nov 2019 10:58 Operator: LH
Sample : 0.5ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:01 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071913.D
Acq On : 7 Nov 2019 11:31 Operator: LH
Sample : 1.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:03 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	239601	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	13.29	114	1035971	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	527912	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.02	65	390727	11.593	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 92.72%				
57) Toluene-d8 (SS2)	15.74	98	1137643	11.928	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.44%				
73) Bromofluorobenzene (SS3)	19.00	174	448322	13.826	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 110.64%				
Target Compounds							Qvalue
2) Propene	4.14	42	48932	1.342	ng		99
3) Dichlorodifluoromethan...	4.29	85	55067	0.995	ng		100
4) Chloromethane	4.56	50	31292	0.751	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	27692	0.860	ng		99
6) Vinyl Chloride	4.98	62	43038	0.923	ng		100
7) 1,3-Butadiene	5.24	54	30726	0.911	ng		100
8) Bromomethane	5.67	94	25326	1.037	ng		100
9) Chloroethane	6.01	64	22703	1.191	ng		99
10) Ethanol	6.32	45	124234	5.538	ng		100
11) Acetonitrile	6.60	41	62738	1.204	ng		99
12) Acrolein	6.81	56	18636	1.032	ng		99
13) Acetone	7.01	58	120397	5.153	ng		94
14) Trichlorofluoromethane	7.27	101	46615	0.941	ng		100
15) 2-Propanol (Isopropanol)	7.49	45	115733	1.816	ng		91
16) Acrylonitrile	7.76	53	42089	1.130	ng		98
17) 1,1-Dichloroethene	8.22	96	26491	1.064	ng		97
18) 2-Methyl-2-Propanol (t...	8.38	59	98559	2.895	ng		92
19) Methylene Chloride	8.43	84	29004	1.070	ng		97
20) 3-Chloro-1-propene (Al...	8.61	41	45899	1.147	ng		96
21) Trichlorotrifluoroethane	8.87	151	24187	1.039	ng		97
22) Carbon Disulfide	8.71	76	110065	1.135	ng		98
23) trans-1,2-Dichloroethene	9.71	61	41825	1.093	ng		98
24) 1,1-Dichloroethane	9.96	63	53589	1.115	ng		99
25) Methyl tert-Butyl Ether	10.08	73	58841	1.495	ng		99
26) Vinyl Acetate	10.22	86	18934	3.357	ng	#	79
27) 2-Butanone (MEK)	10.48	72	19444	1.029	ng		98
28) cis-1,2-Dichloroethene	10.98	61	40491	1.049	ng		98
29) Diisopropyl Ether	11.30	87	26366	1.058	ng	#	86
30) Ethyl Acetate	11.30	61	22050	2.195	ng		99
31) n-Hexane	11.28	57	50142	1.080	ng		99
32) Chloroform	11.33	83	47744	1.007	ng		99
34) Tetrahydrofuran (THF)	11.75	72	19717	1.070	ng		97
35) Ethyl tert-Butyl Ether	11.89	87	22107	1.655	ng		97
36) 1,2-Dichloroethane	12.14	62	36199	0.930	ng		99
38) 1,1,1-Trichloroethane	12.42	97	39833	0.933	ng		99
39) Isopropyl Acetate	12.85	61	38654	2.066	ng	#	93
40) 1-Butanol	12.87	56	52617	1.948	ng		91
41) Benzene	12.90	78	117317	1.069	ng		100
42) Carbon Tetrachloride	13.06	117	32131	0.925	ng		99
43) Cyclohexane	13.19	84	86539	2.121	ng		95
44) tert-Amyl Methyl Ether	13.54	73	57618	1.698	ng		96
45) 1,2-Dichloropropane	13.75	63	31051	1.115	ng		99
46) Bromodichloromethane	13.94	83	36518	0.995	ng		99
47) Trichloroethene	14.00	130	28491	1.032	ng		99
48) 1,4-Dioxane	13.97	88	23608	1.089	ng		95
49) 2,2,4-Trimethylpentane...	14.07	57	131793	1.181	ng		99

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071913.D
Acq On : 7 Nov 2019 11:31 Operator: LH
Sample : 1.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:03 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

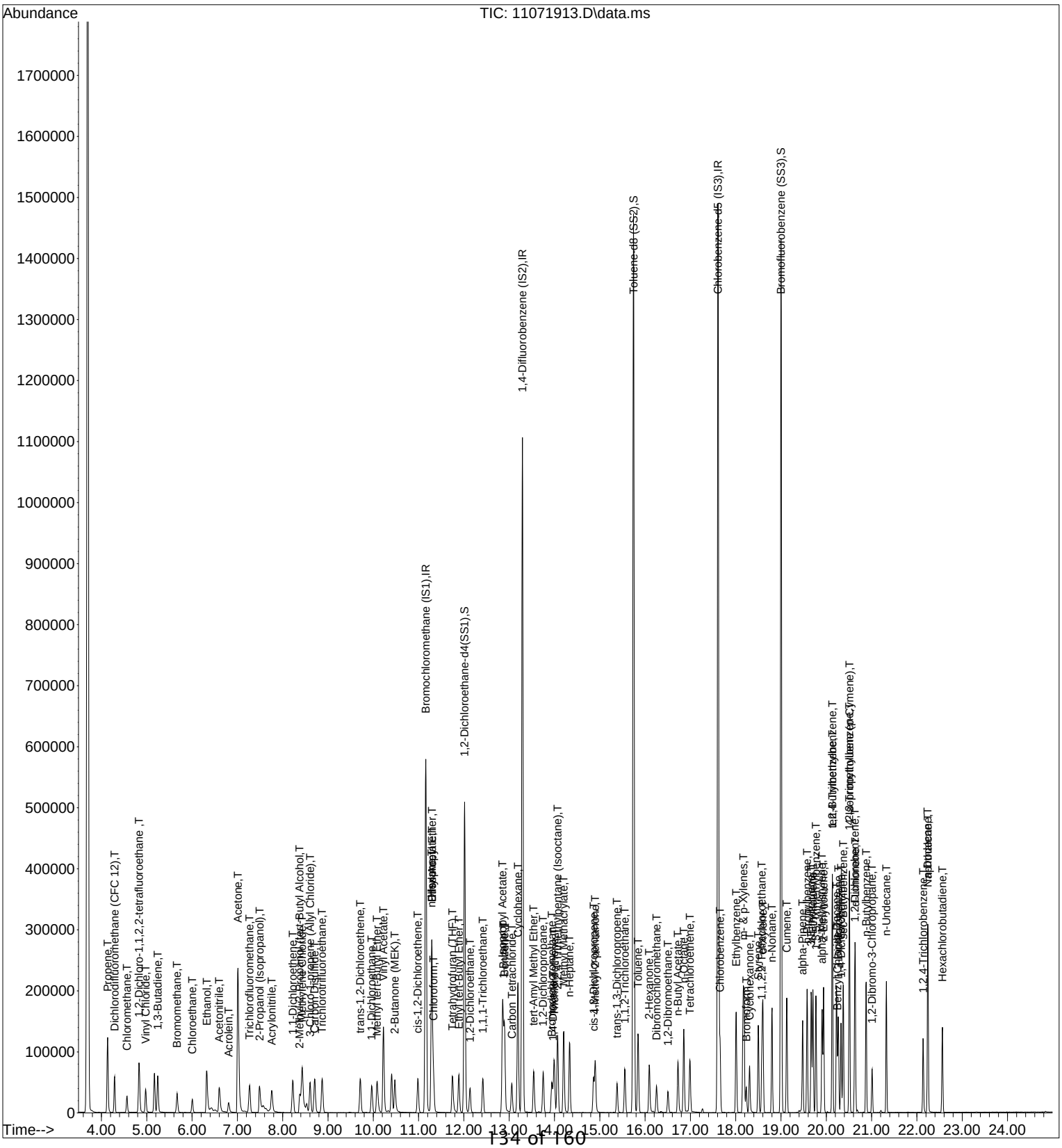
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	21489	2.046	ng	92
51) n-Heptane	14.33	71	29454	1.111	ng	99
52) cis-1,3-Dichloropropene	14.86	75	40224	0.944	ng	99
53) 4-Methyl-2-pentanone	14.90	58	28445	1.118	ng	94
54) trans-1,3-Dichloropropene	15.38	75	32059	0.897	ng	99
55) 1,1,2-Trichloroethane	15.55	97	27242	1.058	ng	100
58) Toluene	15.84	91	110612	0.933	ng	99
59) 2-Hexanone	16.09	43	70388	0.953	ng	97
60) Dibromochloromethane	16.25	129	28869	0.921	ng	98
61) 1,2-Dibromoethane	16.50	107	29509	0.936	ng	99
62) n-Butyl Acetate	16.72	43	77352	0.970	ng	100
63) n-Octane	16.86	57	27229	1.084	ng	97
64) Tetrachloroethene	16.99	166	30623	0.953	ng	99
65) Chlorobenzene	17.65	112	70556	0.905	ng	99
66) Ethylbenzene	18.01	91	128705	0.980	ng	99
67) m- & p-Xylenes	18.17	91	201508	2.006	ng	100
68) Bromoform	18.24	173	22062	0.899	ng	99
69) Styrene	18.50	104	74771	0.921	ng	100
70) o-Xylene	18.60	91	101959	1.044	ng	98
71) n-Nonane	18.80	43	67180	1.088	ng	97
72) 1,1,2,2-Tetrachloroethane	18.58	83	51107	1.031	ng	100
74) Cumene	19.13	105	127924	1.005	ng	99
75) alpha-Pinene	19.48	93	60318	1.308	ng	94
76) n-Propylbenzene	19.58	91	160889	1.042	ng	98
77) 3-Ethyltoluene	19.67	105	128112	1.038	ng	99
78) 4-Ethyltoluene	19.70	105	120704	1.062	ng	98
79) 1,3,5-Trimethylbenzene	19.77	105	104259	1.031	ng	99
80) alpha-Methylstyrene	19.91	118	51929	1.033	ng	98
81) 2-Ethyltoluene	19.94	105	126972	1.090	ng	98
82) 1,2,4-Trimethylbenzene	20.13	105	105560	1.053	ng	100
83) n-Decane	20.23	57	65667	1.165	ng	97
84) Benzyl Chloride	20.25	91	41540	0.578	ng	95
85) 1,3-Dichlorobenzene	20.27	146	60440	1.056	ng	100
86) 1,4-Dichlorobenzene	20.32	146	61044	1.043	ng	100
87) sec-Butylbenzene	20.37	105	143028	1.092	ng	99
88) 4-Isopropyltoluene (p-...	20.51	119	132585	1.036	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	107463	1.071	ng	99
90) 1,2-Dichlorobenzene	20.63	146	58862	1.039	ng	100
91) d-Limonene	20.64	68	42553	1.205	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.01	157	19260	0.918	ng	84
93) n-Undecane	21.33	57	64425	1.114	ng	98
94) 1,2,4-Trichlorobenzene	22.14	180	40013	1.025	ng	99
95) Naphthalene	22.24	128	118163	0.984	ng	99
96) n-Dodecane	22.24	57	51807	1.020	ng	96
97) Hexachlorobutadiene	22.56	225	28114	1.152	ng	99
98) Cyclohexanone	18.31	55	39198	0.894	ng	97
99) tert-Butylbenzene	20.13	119	103125	1.056	ng	100
100) n-Butylbenzene	20.88	91	117081	1.048	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071913.D
Acq On : 7 Nov 2019 11:31 Operator: LH
Sample : 1.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11061902 (12/5)
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Nov 07 14:20:03 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071914.D
Acq On : 7 Nov 2019 12:04 Operator: LH
Sample : 5.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11051901 (12/4)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 07 14:20:05 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.16	130	238299	12.500	ng		-0.01
37) 1,4-Difluorobenzene (IS2)	13.29	114	1012944	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	491745	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.02	65	384957	11.484	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 91.84%				
57) Toluene-d8 (SS2)	15.74	98	1078033	12.134	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.04%				
73) Bromofluorobenzene (SS3)	19.00	174	382464	12.662	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.28%				
Target Compounds							Qvalue
2) Propene	4.11	42	234481	6.468	ng		100
3) Dichlorodifluoromethan...	4.27	85	274420	4.987	ng		100
4) Chloromethane	4.54	50	171733	4.146	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	134424	4.197	ng		100
6) Vinyl Chloride	4.96	62	219080	4.724	ng		100
7) 1,3-Butadiene	5.23	54	162956	4.861	ng		99
8) Bromomethane	5.66	94	129033	5.310	ng		100
9) Chloroethane	5.99	64	114171	6.022	ng		100
10) Ethanol	6.33	45	602443	27.002	ng		100
11) Acetonitrile	6.60	41	304638	5.877	ng		99
12) Acrolein	6.80	56	95999	5.343	ng		100
13) Acetone	7.00	58	575159	24.753	ng		98
14) Trichlorofluoromethane	7.26	101	232759	4.726	ng		100
15) 2-Propanol (Isopropanol)	7.48	45	626633	9.886	ng		98
16) Acrylonitrile	7.76	53	213994	5.777	ng		100
17) 1,1-Dichloroethene	8.22	96	134225	5.420	ng		98
18) 2-Methyl-2-Propanol (t...	8.36	59	522177	15.422	ng		94
19) Methylene Chloride	8.44	84	142662	5.290	ng		97
20) 3-Chloro-1-propene (Al...	8.61	41	237978	5.981	ng		99
21) Trichlorotrifluoroethane	8.87	151	120247	5.192	ng		98
22) Carbon Disulfide	8.71	76	548941	5.690	ng		100
23) trans-1,2-Dichloroethene	9.72	61	212969	5.597	ng		98
24) 1,1-Dichloroethane	9.97	63	266947	5.584	ng		100
25) Methyl tert-Butyl Ether	10.07	73	305507	7.805	ng		100
26) Vinyl Acetate	10.22	86	129428	23.075	ng	#	86
27) 2-Butanone (MEK)	10.47	72	95916	5.103	ng		97
28) cis-1,2-Dichloroethene	10.99	61	203204	5.294	ng		98
29) Diisopropyl Ether	11.29	87	132111	5.331	ng	#	91
30) Ethyl Acetate	11.29	61	112934	11.301	ng		99
31) n-Hexane	11.28	57	248884	5.391	ng		99
32) Chloroform	11.33	83	234677	4.976	ng		100
34) Tetrahydrofuran (THF)	11.74	72	98432	5.373	ng		99
35) Ethyl tert-Butyl Ether	11.88	87	114745	8.636	ng		98
36) 1,2-Dichloroethane	12.14	62	180136	4.655	ng		99
38) 1,1,1-Trichloroethane	12.42	97	202514	4.849	ng		99
39) Isopropyl Acetate	12.85	61	200699	10.970	ng		98
40) 1-Butanol	12.86	56	265751	10.062	ng		95
41) Benzene	12.90	78	568348	5.299	ng		100
42) Carbon Tetrachloride	13.06	117	168902	4.975	ng		99
43) Cyclohexane	13.19	84	427501	10.715	ng		98
44) tert-Amyl Methyl Ether	13.54	73	290720	8.760	ng		99
45) 1,2-Dichloropropane	13.75	63	155339	5.707	ng		100
46) Bromodichloromethane	13.94	83	187925	5.236	ng		100
47) Trichloroethene	14.00	130	139544	5.171	ng		100
48) 1,4-Dioxane	13.97	88	94862	4.477	ng		97
49) 2,2,4-Trimethylpentane...	14.07	57	643593	5.900	ng		100

Data File: I:\MS16\DATA\2019_11\07\11071914.D
Acq On : 7 Nov 2019 12:04 Operator: LH
Sample : 5.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11051901 (12/4)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 07 14:20:05 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

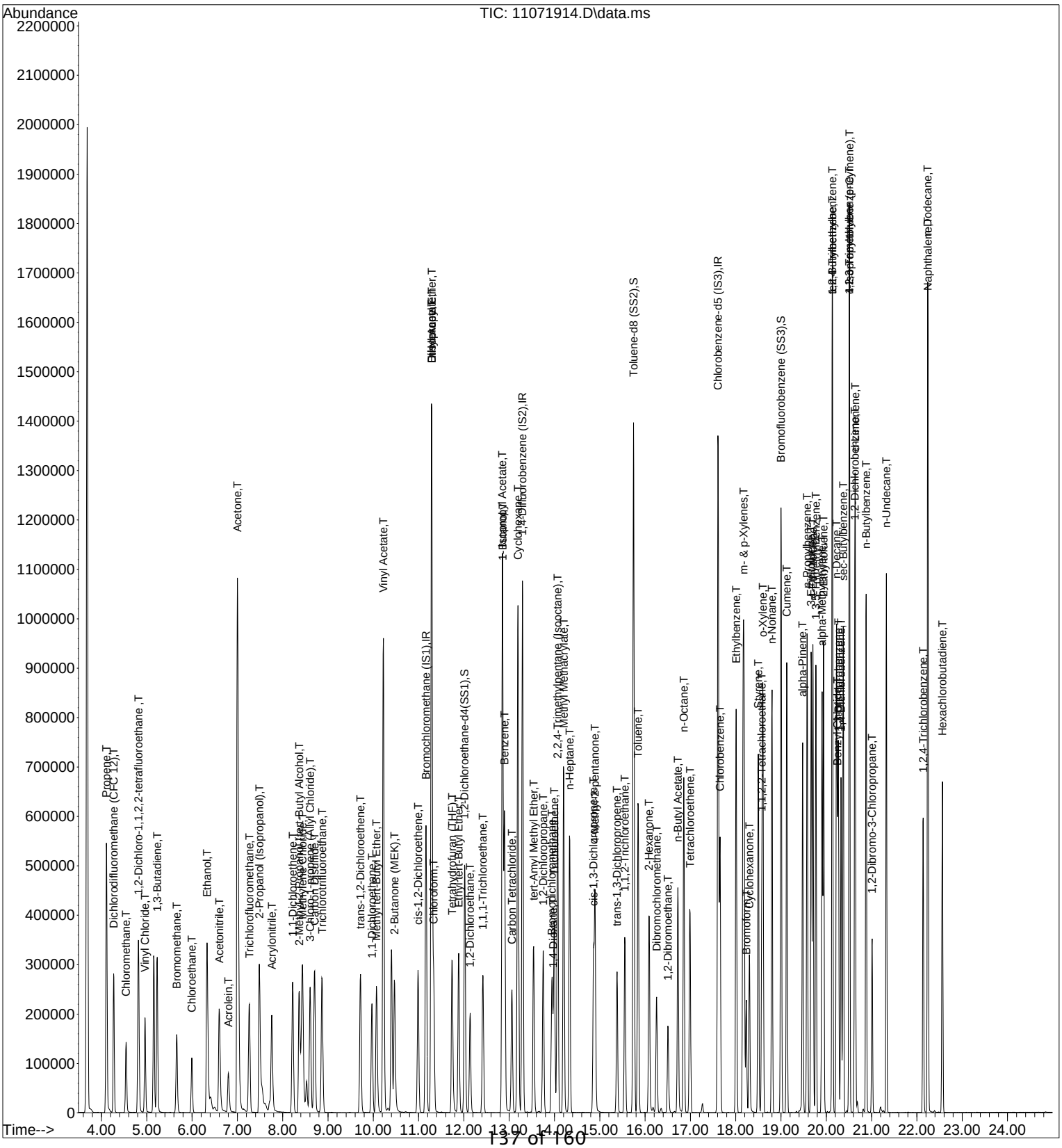
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	111974	10.905	ng	97
51) n-Heptane	14.33	71	144848	5.587	ng	99
52) cis-1,3-Dichloropropene	14.86	75	219954	5.278	ng	100
53) 4-Methyl-2-pentanone	14.89	58	140994	5.667	ng	97
54) trans-1,3-Dichloropropene	15.38	75	186718	5.342	ng	100
55) 1,1,2-Trichloroethane	15.55	97	135469	5.380	ng	100
58) Toluene	15.84	91	544045	4.926	ng	100
59) 2-Hexanone	16.09	43	343203	4.989	ng	99
60) Dibromochloromethane	16.26	129	151849	5.203	ng	100
61) 1,2-Dibromoethane	16.50	107	149397	5.087	ng	99
62) n-Butyl Acetate	16.72	43	399804	5.381	ng	100
63) n-Octane	16.86	57	135163	5.775	ng	98
64) Tetrachloroethene	16.99	166	150358	5.025	ng	100
65) Chlorobenzene	17.65	112	344409	4.743	ng	100
66) Ethylbenzene	18.01	91	639801	5.228	ng	99
67) m- & p-Xylenes	18.17	91	961513	10.274	ng	99
68) Bromoform	18.24	173	119555	5.229	ng	100
69) Styrene	18.50	104	380961	5.040	ng	100
70) o-Xylene	18.60	91	481522	5.295	ng	99
71) n-Nonane	18.80	43	332661	5.782	ng	98
72) 1,1,2,2-Tetrachloroethane	18.58	83	248518	5.381	ng	99
74) Cumene	19.13	105	620376	5.232	ng	99
75) alpha-Pinene	19.48	93	301514	7.018	ng	99
76) n-Propylbenzene	19.58	91	771553	5.367	ng	99
77) 3-Ethyltoluene	19.67	105	614253	5.343	ng	99
78) 4-Ethyltoluene	19.70	105	566506	5.353	ng	99
79) 1,3,5-Trimethylbenzene	19.77	105	487448	5.174	ng	99
80) alpha-Methylstyrene	19.91	118	259653	5.547	ng	92
81) 2-Ethyltoluene	19.94	105	587353	5.415	ng	99
82) 1,2,4-Trimethylbenzene	20.13	105	496917	5.320	ng	99
83) n-Decane	20.23	57	310726	5.918	ng	98
84) Benzyl Chloride	20.25	91	304906	4.551	ng	98
85) 1,3-Dichlorobenzene	20.27	146	280838	5.269	ng	100
86) 1,4-Dichlorobenzene	20.32	146	279646	5.128	ng	100
87) sec-Butylbenzene	20.37	105	663130	5.436	ng	99
88) 4-Isopropyltoluene (p-...	20.51	119	626102	5.253	ng	99
89) 1,2,3-Trimethylbenzene	20.51	105	505232	5.408	ng	99
90) 1,2-Dichlorobenzene	20.63	146	274298	5.196	ng	99
91) d-Limonene	20.64	68	203036	6.172	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.01	157	98589	5.043	ng	92
93) n-Undecane	21.33	57	336056	6.237	ng	98
94) 1,2,4-Trichlorobenzene	22.14	180	196514	5.405	ng	100
95) Naphthalene	22.24	128	590983	5.281	ng	100
96) n-Dodecane	22.24	57	301976	6.381	ng	98
97) Hexachlorobutadiene	22.56	225	135078	5.943	ng	100
98) Cyclohexanone	18.30	55	156263	3.825	ng	98
99) tert-Butylbenzene	20.13	119	484944	5.332	ng	99
100) n-Butylbenzene	20.88	91	567449	5.453	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071914.D
Acq On : 7 Nov 2019 12:04 Operator: LH
Sample : 5.0ng TO15 ICAL STD
Misc : S31-10161904/S31/11051901 (12/4)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Nov 07 14:20:05 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071915.D
Acq On : 7 Nov 2019 12:37 Operator: LH
Sample : 25ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:07 2019
Quant Method : I:\MS16\METHODS\R16110719.M LH 11/7/19
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	243145	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.30	114	1011289	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	504677	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	12.03	65	385666	11.276	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 90.24%			
57) Toluene-d8 (SS2)	15.75	98	1097431	12.036	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.32%			
73) Bromofluorobenzene (SS3)	19.00	174	386327	12.462	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.68%			
Target Compounds						Qvalue
2) Propene	4.10	42	1060410	28.667	ng	100
3) Dichlorodifluoromethan...	4.26	85	1244611	22.167	ng	100
4) Chloromethane	4.54	50	870100	20.587	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	613532	18.776	ng	100
6) Vinyl Chloride	4.97	62	1009727	21.338	ng	100
7) 1,3-Butadiene	5.23	54	825532	24.133	ng	100
8) Bromomethane	5.66	94	613991	24.764	ng	100
9) Chloroethane	6.00	64	543801	28.109	ng	100
10) Ethanol	6.37	45	2884029	126.690	ng	100
11) Acetonitrile	6.62	41	1509040	28.530	ng	100
12) Acrolein	6.81	56	477266	26.036	ng	100
13) Acetone	7.01	58	2603387	109.807	ng	100
14) Trichlorofluoromethane	7.26	101	1066321	21.220	ng	100
15) 2-Propanol (Isopropanol)	7.50	45	3263725	50.464	ng	100
16) Acrylonitrile	7.77	53	1056604	27.957	ng	100
17) 1,1-Dichloroethene	8.22	96	640252	25.340	ng	100
18) 2-Methyl-2-Propanol (t...	8.38	59	2678015	77.516	ng	100
19) Methylene Chloride	8.45	84	667286	24.252	ng	100
20) 3-Chloro-1-propene (Al...	8.61	41	1181721	29.107	ng	100
21) Trichlorotrifluoroethane	8.86	151	560681	23.725	ng	100
22) Carbon Disulfide	8.71	76	2530153	25.701	ng	100
23) trans-1,2-Dichloroethene	9.72	61	1011803	26.063	ng	100
24) 1,1-Dichloroethane	9.98	63	1264306	25.918	ng	100
25) Methyl tert-Butyl Ether	10.07	73	1519558	38.050	ng	100
26) Vinyl Acetate	10.23	86	705494	123.270	ng	100
27) 2-Butanone (MEK)	10.47	72	464597	24.224	ng	100
28) cis-1,2-Dichloroethene	10.99	61	963007	24.589	ng	100
29) Diisopropyl Ether	11.29	87	602582	23.832	ng	100
30) Ethyl Acetate	11.30	61	502020	49.237	ng	100
31) n-Hexane	11.28	57	1109774	23.560	ng	100
32) Chloroform	11.34	83	1042236	21.657	ng	100
34) Tetrahydrofuran (THF)	11.74	72	483538	25.867	ng	100
35) Ethyl tert-Butyl Ether	11.88	87	553003	40.789	ng	100
36) 1,2-Dichloroethane	12.14	62	849681	21.521	ng	100
38) 1,1,1-Trichloroethane	12.42	97	954520	22.894	ng	100
39) Isopropyl Acetate	12.85	61	941283	51.535	ng	100
40) 1-Butanol	12.87	56	1332728	50.541	ng	100
41) Benzene	12.90	78	2452781	22.905	ng	100
42) Carbon Tetrachloride	13.06	117	822081	24.255	ng	100
43) Cyclohexane	13.19	84	1932604	48.520	ng	100
44) tert-Amyl Methyl Ether	13.54	73	1409138	42.532	ng	100
45) 1,2-Dichloropropane	13.75	63	729766	26.856	ng	100
46) Bromodichloromethane	13.95	83	891489	24.879	ng	100
47) Trichloroethene	14.00	130	630689	23.411	ng	100
48) 1,4-Dioxane	13.97	88	525397	24.836	ng	100
49) 2,2,4-Trimethylpentane...	14.07	57	2798959	25.703	ng	100

Data File: I:\MS16\DATA\2019_11\07\11071915.D
Acq On : 7 Nov 2019 12:37 Operator: LH
Sample : 25ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:07 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

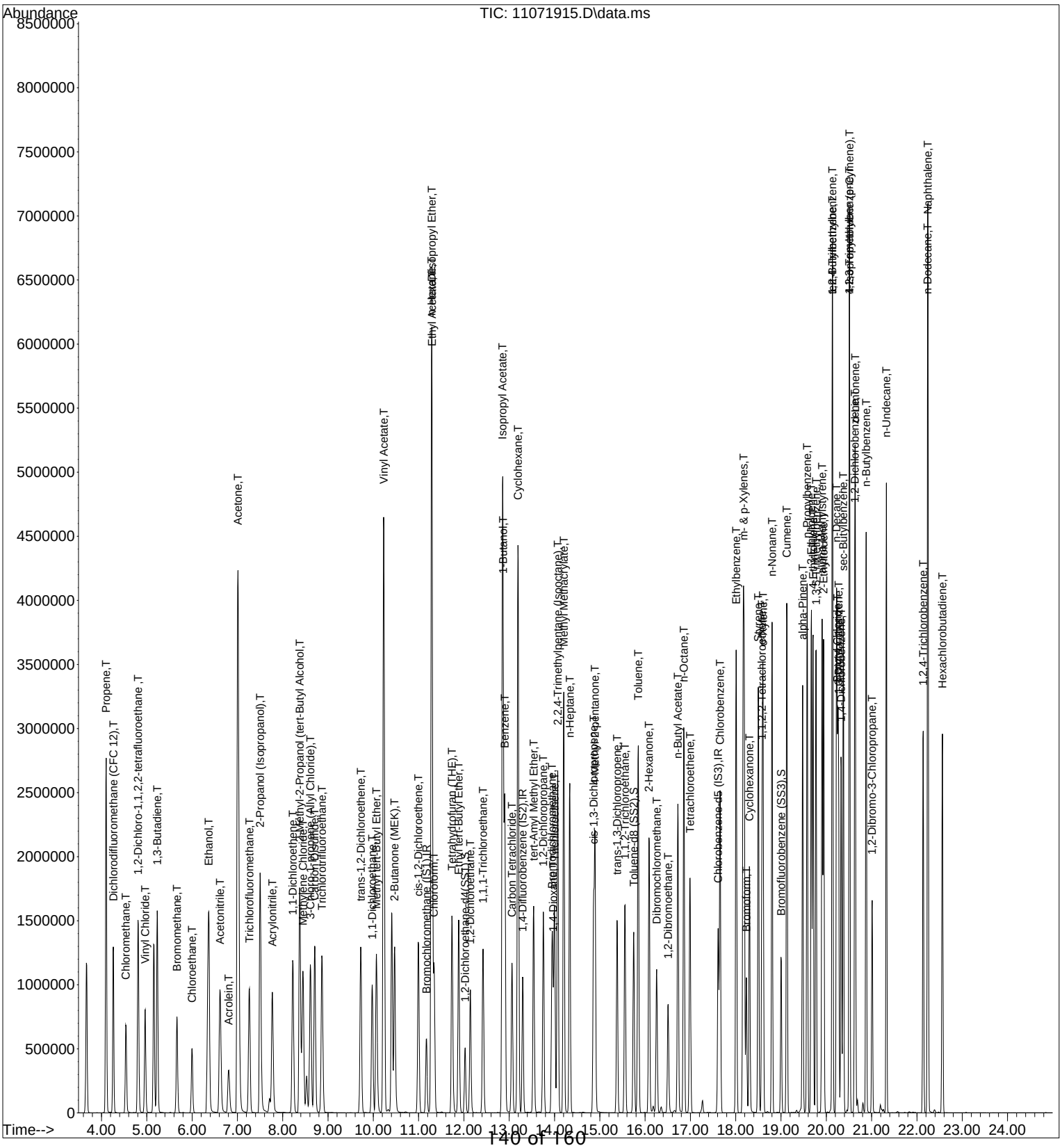
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	534479	52.137	ng	100
51) n-Heptane	14.34	71	669636	25.871	ng	100
52) cis-1,3-Dichloropropene	14.86	75	1110174	26.685	ng	100
53) 4-Methyl-2-pentanone	14.89	58	668187	26.903	ng	100
54) trans-1,3-Dichloropropene	15.38	75	990418	28.383	ng	100
55) 1,1,2-Trichloroethane	15.56	97	633969	25.218	ng	100
58) Toluene	15.85	91	2459671	21.698	ng	100
59) 2-Hexanone	16.08	43	1772552	25.107	ng	100
60) Dibromochloromethane	16.26	129	736339	24.585	ng	100
61) 1,2-Dibromoethane	16.51	107	723741	24.010	ng	100
62) n-Butyl Acetate	16.72	43	2085051	27.346	ng	100
63) n-Octane	16.85	57	619615	25.793	ng	100
64) Tetrachloroethene	16.99	166	675971	22.013	ng	100
65) Chlorobenzene	17.65	112	1621103	21.752	ng	100
66) Ethylbenzene	18.01	91	2907854	23.150	ng	100
67) m- & p-Xylenes	18.17	91	4179594	43.518	ng	100
68) Bromoform	18.24	173	568054	24.210	ng	100
69) Styrene	18.50	104	1779070	22.933	ng	100
70) o-Xylene	18.60	91	1991230	21.336	ng	100
71) n-Nonane	18.80	43	1475597	24.990	ng	100
72) 1,1,2,2-Tetrachloroethane	18.58	83	1083559	22.861	ng	100
74) Cumene	19.13	105	2754312	22.635	ng	100
75) alpha-Pinene	19.48	93	1362964	30.912	ng	100
76) n-Propylbenzene	19.58	91	3330448	22.572	ng	100
77) 3-Ethyltoluene	19.67	105	2584089	21.902	ng	100
78) 4-Ethyltoluene	19.71	105	2406506	22.158	ng	100
79) 1,3,5-Trimethylbenzene	19.77	105	2061463	21.321	ng	100
80) alpha-Methylstyrene	19.91	118	1197035	24.916	ng	100
81) 2-Ethyltoluene	19.94	105	2391765	21.483	ng	100
82) 1,2,4-Trimethylbenzene	20.13	105	2044695	21.331	ng	100
83) n-Decane	20.23	57	1299738	24.120	ng	100
84) Benzyl Chloride	20.25	91	1680765	24.445	ng	100
85) 1,3-Dichlorobenzene	20.27	146	1161905	21.241	ng	100
86) 1,4-Dichlorobenzene	20.33	146	1212579	21.664	ng	100
87) sec-Butylbenzene	20.37	105	2677121	21.385	ng	100
88) 4-Isopropyltoluene (p-...	20.51	119	2461230	20.119	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	2045653	21.336	ng	100
90) 1,2-Dichlorobenzene	20.63	146	1180021	21.780	ng	100
91) d-Limonene	20.64	68	797218	23.613	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.01	157	497290	24.783	ng	100
93) n-Undecane	21.33	57	1540840	27.863	ng	100
94) 1,2,4-Trichlorobenzene	22.14	180	1011939	27.119	ng	100
95) Naphthalene	22.24	128	2825714	24.604	ng	100
96) n-Dodecane	22.24	57	1232040	25.368	ng	100
97) Hexachlorobutadiene	22.56	225	625855	26.830	ng	100
98) Cyclohexanone	18.30	55	922222	21.997	ng	100
99) tert-Butylbenzene	20.13	119	1963210	21.032	ng	100
100) n-Butylbenzene	20.88	91	2482476	23.243	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071915.D
Acq On : 7 Nov 2019 12:37 Operator: LH
Sample : 25ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:07 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071916.D
Acq On : 7 Nov 2019 13:10 Operator: LH
Sample : 50ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.18	130	247812	12.500	ng		0.00
37) 1,4-Difluorobenzene (IS2)	13.30	114	1010870	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	510813	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.03	65	386180	11.078	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 88.64%				
57) Toluene-d8 (SS2)	15.75	98	1100898	11.929	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.44%				
73) Bromofluorobenzene (SS3)	19.01	174	391016	12.462	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.68%				
Target Compounds							Qvalue
2) Propene	4.11	42	2171109	57.588	ng		100
3) Dichlorodifluoromethan...	4.27	85	2312603	40.413	ng		99
4) Chloromethane	4.55	50	1131495	26.268	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.82	135	1170185	35.136	ng		100
6) Vinyl Chloride	4.98	62	1967178	40.789	ng		100
7) 1,3-Butadiene	5.25	54	1562266	44.809	ng		99
8) Bromomethane	5.68	94	1198805	47.441	ng		100
9) Chloroethane	6.01	64	1081867	54.869	ng		100
10) Ethanol	6.40	45	5536168	238.614	ng		100
11) Acetonitrile	6.64	41	3051298	56.601	ng		100
12) Acrolein	6.82	56	958019	51.277	ng		99
13) Acetone	7.03	58	4744047	196.329	ng		99
14) Trichlorofluoromethane	7.28	101	2056888	40.162	ng		100
15) 2-Propanol (Isopropanol)	7.52	45	5517787	83.709	ng		100
16) Acrylonitrile	7.79	53	2117356	54.969	ng		100
17) 1,1-Dichloroethene	8.23	96	1265329	49.136	ng		98
18) 2-Methyl-2-Propanol (t...	8.40	59	5161591	146.590	ng		99
19) Methylene Chloride	8.46	84	1281481	45.697	ng		98
20) 3-Chloro-1-propene (Al...	8.62	41	2323839	56.160	ng		99
21) Trichlorotrifluoroethane	8.88	151	1081726	44.912	ng		98
22) Carbon Disulfide	8.72	76	4842978	48.269	ng		100
23) trans-1,2-Dichloroethene	9.73	61	1971707	49.832	ng		99
24) 1,1-Dichloroethane	9.98	63	2473160	49.743	ng		100
25) Methyl tert-Butyl Ether	10.07	73	3042635	74.753	ng		100
26) Vinyl Acetate	10.25	86	1350041	231.448	ng	#	83
27) 2-Butanone (MEK)	10.48	72	912753	46.695	ng		97
28) cis-1,2-Dichloroethene	11.00	61	1876562	47.013	ng		99
29) Diisopropyl Ether	11.30	87	947401	36.764	ng	#	83
30) Ethyl Acetate	11.30	61	853676	82.149	ng		97
31) n-Hexane	11.28	57	1969162	41.017	ng		99
32) Chloroform	11.35	83	1940838	39.570	ng		100
34) Tetrahydrofuran (THF)	11.74	72	963334	50.563	ng		98
35) Ethyl tert-Butyl Ether	11.89	87	1095290	79.267	ng		97
36) 1,2-Dichloroethane	12.15	62	1664489	41.365	ng		100
38) 1,1,1-Trichloroethane	12.42	97	1845480	44.282	ng		99
39) Isopropyl Acetate	12.86	61	1745146	95.586	ng		97
40) 1-Butanol	12.88	56	2368497	89.857	ng		99
41) Benzene	12.91	78	4380244	40.921	ng		100
42) Carbon Tetrachloride	13.07	117	1584141	46.759	ng		100
43) Cyclohexane	13.20	84	3482614	87.471	ng		98
44) tert-Amyl Methyl Ether	13.54	73	2759232	83.316	ng		99
45) 1,2-Dichloropropane	13.76	63	1415637	52.118	ng		100
46) Bromodichloromethane	13.95	83	1711252	47.775	ng		100
47) Trichloroethene	14.00	130	1163362	43.201	ng		100
48) 1,4-Dioxane	13.97	88	968956	45.823	ng		99
49) 2,2,4-Trimethylpentane...	14.07	57	5046650	46.363	ng		100

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071916.D
Acq On : 7 Nov 2019 13:10 Operator: LH
Sample : 50ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

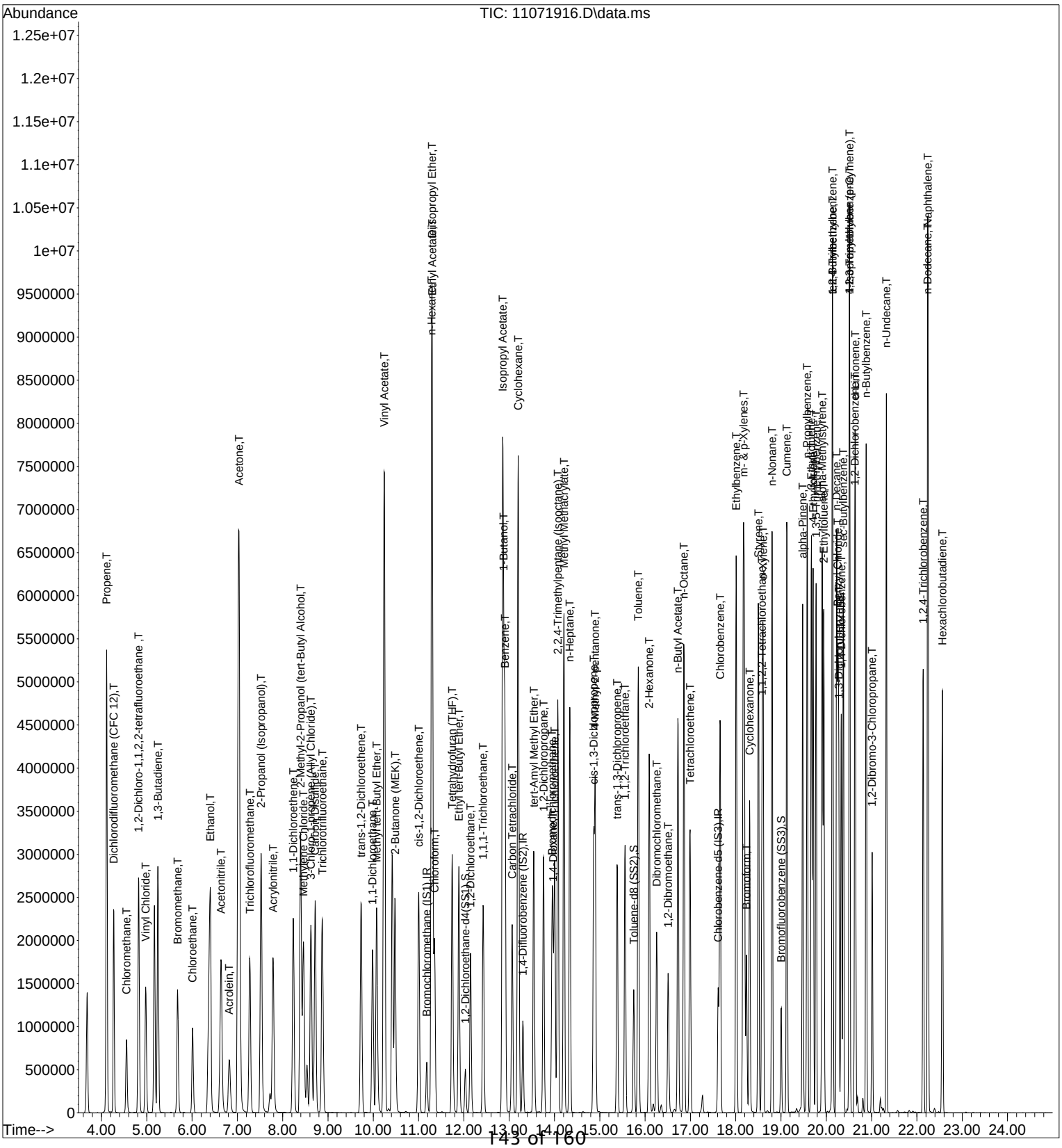
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.21	100	1013747	98.930	ng	96
51) n-Heptane	14.34	71	1255745	48.535	ng	99
52) cis-1,3-Dichloropropene	14.86	75	2178960	52.397	ng	100
53) 4-Methyl-2-pentanone	14.90	58	1226970	49.421	ng	98
54) trans-1,3-Dichloropropene	15.38	75	1965006	56.335	ng	100
55) 1,1,2-Trichloroethane	15.56	97	1208136	48.078	ng	100
58) Toluene	15.85	91	4609300	40.173	ng	100
59) 2-Hexanone	16.09	43	3396227	47.528	ng	100
60) Dibromochloromethane	16.26	129	1407548	46.430	ng	99
61) 1,2-Dibromoethane	16.51	107	1393351	45.669	ng	100
62) n-Butyl Acetate	16.72	43	4025587	52.162	ng	99
63) n-Octane	16.86	57	1148502	47.235	ng	98
64) Tetrachloroethene	16.99	166	1250413	40.231	ng	99
65) Chlorobenzene	17.66	112	3042907	40.339	ng	100
66) Ethylbenzene	18.01	91	5347520	42.061	ng	100
67) m- & p-Xylenes	18.17	91	7342820	75.535	ng	99
68) Bromoform	18.24	173	1035643	43.609	ng	100
69) Styrene	18.50	104	3268170	41.622	ng	99
70) o-Xylene	18.60	91	3416001	36.163	ng	99
71) n-Nonane	18.80	43	2626058	43.940	ng	98
72) 1,1,2,2-Tetrachloroethane	18.58	83	1925825	40.144	ng	100
74) Cumene	19.13	105	4936222	40.080	ng	100
75) alpha-Pinene	19.48	93	2480560	55.583	ng	100
76) n-Propylbenzene	19.58	91	5870823	39.312	ng	100
77) 3-Ethyltoluene	19.67	105	4416899	36.986	ng	96
78) 4-Ethyltoluene	19.71	105	4123918	37.516	ng	94
79) 1,3,5-Trimethylbenzene	19.78	105	3577479	36.556	ng	99
80) alpha-Methylstyrene	19.91	118	2134488	43.895	ng	100
81) 2-Ethyltoluene	19.95	105	3979294	35.314	ng	99
82) 1,2,4-Trimethylbenzene	20.14	105	3293166	33.943	ng	98
83) n-Decane	20.23	57	2175379	39.885	ng	99
84) Benzyl Chloride	20.25	91	2984278	42.881	ng	100
85) 1,3-Dichlorobenzene	20.28	146	1949149	35.204	ng	100
86) 1,4-Dichlorobenzene	20.33	146	2078800	36.695	ng	99
87) sec-Butylbenzene	20.37	105	4391918	34.662	ng	100
88) 4-Isopropyltoluene (p-...	20.51	119	3822028	30.867	ng	98
89) 1,2,3-Trimethylbenzene	20.51	105	3218634	33.167	ng	98
90) 1,2-Dichlorobenzene	20.63	146	1962585	35.788	ng	100
91) d-Limonene	20.64	68	1189603	34.811	ng	96
92) 1,2-Dibromo-3-Chloropr...	21.01	157	934264	46.001	ng	95
93) n-Undecane	21.33	57	2687188	48.008	ng	99
94) 1,2,4-Trichlorobenzene	22.14	180	1835796	48.606	ng	99
95) Naphthalene	22.24	128	4591140	39.496	ng	100
96) n-Dodecane	22.24	57	1824162	37.109	ng	98
97) Hexachlorobutadiene	22.56	225	1118813	47.387	ng	99
98) Cyclohexanone	18.31	55	1686740	39.750	ng	98
99) tert-Butylbenzene	20.14	119	3123677	33.062	ng	99
100) n-Butylbenzene	20.88	91	4325059	40.008	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071916.D
Acq On : 7 Nov 2019 13:10 Operator: LH
Sample : 50ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071917.D
Acq On : 7 Nov 2019 13:43 Operator: LH
Sample : 100ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:11 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS) LH 11/7/19
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.19	130	249872	12.500	ng		0.01
37) 1,4-Difluorobenzene (IS2)	13.31	114	997106	12.500	ng		0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	507805	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.04	65	383642	10.915	ng		0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 87.28%				
57) Toluene-d8 (SS2)	15.76	98	1095270	11.938	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.52%				
73) Bromofluorobenzene (SS3)	19.01	174	393503	12.616	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.96%				
Target Compounds							Qvalue
2) Propene	4.12	42	3564990	93.781	ng		100
3) Dichlorodifluoromethan...	4.27	85	3989830	69.147	ng		100
4) Chloromethane	4.56	50	1017480	23.426	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.83	135	2093005	62.327	ng		100
6) Vinyl Chloride	4.99	62	3617817	74.397	ng		100
7) 1,3-Butadiene	5.26	54	2712022	77.145	ng		99
8) Bromomethane	5.69	94	2175935	85.400	ng		100
9) Chloroethane	6.02	64	2061452	103.688	ng		100
10) Ethanol	6.44	45	9690097	414.210	ng		99
11) Acetonitrile	6.67	41	5850438	107.629	ng		100
12) Acrolein	6.84	56	1848668	98.133	ng		99
13) Acetone	7.05	58	7761071	318.539	ng		100
14) Trichlorofluoromethane	7.28	101	3760602	72.823	ng		100
15) 2-Propanol (Isopropanol)	7.55	45	9704225	146.007	ng		100
16) Acrylonitrile	7.80	53	4002524	103.054	ng		100
17) 1,1-Dichloroethene	8.24	96	2357009	90.774	ng		97
18) 2-Methyl-2-Propanol (t...	8.41	59	5202941	146.546	ng		99
19) Methylene Chloride	8.47	84	2406325	85.101	ng		96
20) 3-Chloro-1-propene (Al...	8.63	41	4361337	104.531	ng		98
21) Trichlorotrifluoroethane	8.88	151	1966024	80.953	ng		96
22) Carbon Disulfide	8.72	76	8707696	86.072	ng		100
23) trans-1,2-Dichloroethene	9.74	61	3620241	90.742	ng		98
24) 1,1-Dichloroethane	9.99	63	4574713	91.254	ng		99
25) Methyl tert-Butyl Ether	10.08	73	5835633	142.190	ng		100
26) Vinyl Acetate	10.26	86	2267598	385.546	ng	#	62
27) 2-Butanone (MEK)	10.49	72	1663674	84.409	ng	#	91
28) cis-1,2-Dichloroethene	11.01	61	3428126	85.177	ng		98
29) Diisopropyl Ether	11.30	87	1479114	56.924	ng		97
30) Ethyl Acetate	11.32	61	1239795	118.322	ng		94
31) n-Hexane	11.29	57	3165259	65.388	ng		99
32) Chloroform	11.36	83	3422524	69.204	ng		99
34) Tetrahydrofuran (THF)	11.75	72	1747147	90.948	ng		97
35) Ethyl tert-Butyl Ether	11.89	87	2062268	148.017	ng		94
36) 1,2-Dichloroethane	12.15	62	3100209	76.410	ng		100
38) 1,1,1-Trichloroethane	12.43	97	3350496	81.505	ng		99
39) Isopropyl Acetate	12.86	61	2870198	159.377	ng	#	91
40) 1-Butanol	12.90	56	3499882	134.613	ng		95
41) Benzene	12.91	78	6689152	63.354	ng		99
42) Carbon Tetrachloride	13.07	117	2864112	85.706	ng		100
43) Cyclohexane	13.20	84	5543891	141.165	ng		96
44) tert-Amyl Methyl Ether	13.54	73	5045173	154.443	ng		98
45) 1,2-Dichloropropane	13.76	63	2539381	94.780	ng		100
46) Bromodichloromethane	13.95	83	3028808	85.726	ng		100
47) Trichloroethene	14.01	130	1924453	72.450	ng		100
48) 1,4-Dioxane	13.98	88	1609129	77.148	ng		96
49) 2,2,4-Trimethylpentane...	14.08	57	8137523	75.790	ng		99

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071917.D
Acq On : 7 Nov 2019 13:43 Operator: LH
Sample : 100ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:11 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

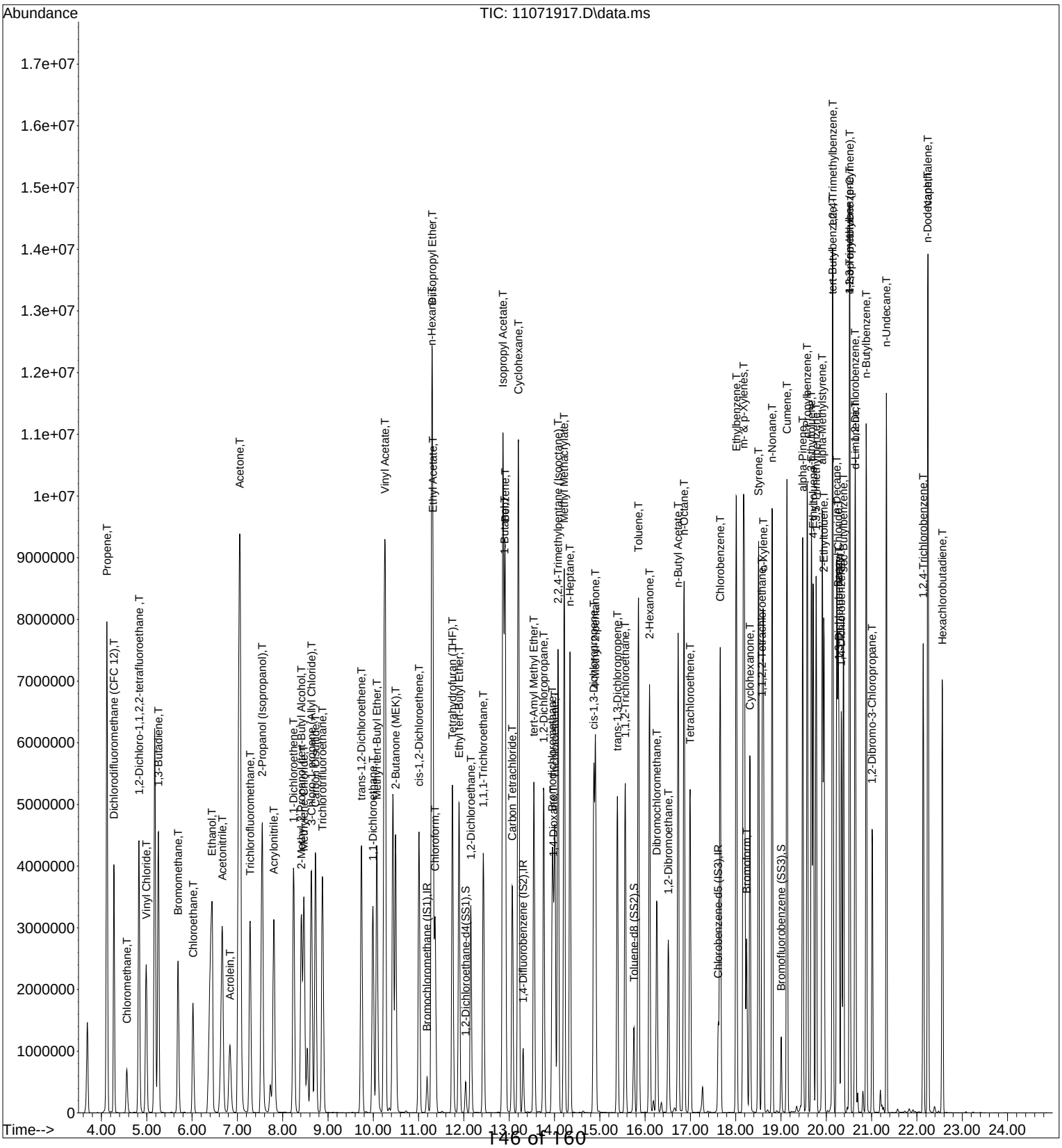
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.22	100	1720319	170.200	ng	92
51) n-Heptane	14.34	71	2124381	83.242	ng	98
52) cis-1,3-Dichloropropene	14.86	75	3914545	95.431	ng	99
53) 4-Methyl-2-pentanone	14.90	58	2033054	83.019	ng	94
54) trans-1,3-Dichloropropene	15.39	75	3613315	105.021	ng	99
55) 1,1,2-Trichloroethane	15.56	97	2143242	86.468	ng	100
58) Toluene	15.85	91	7860860	68.918	ng	100
59) 2-Hexanone	16.10	43	5888890	82.899	ng	99
60) Dibromochloromethane	16.26	129	2476689	82.182	ng	99
61) 1,2-Dibromoethane	16.51	107	2475829	81.629	ng	99
62) n-Butyl Acetate	16.73	43	7031708	91.653	ng	98
63) n-Octane	16.86	57	1900099	78.610	ng	96
64) Tetrachloroethene	16.99	166	2083632	67.437	ng	99
65) Chlorobenzene	17.66	112	5159556	68.803	ng	100
66) Ethylbenzene	18.02	91	8859213	70.095	ng	100
67) m- & p-Xylenes	18.17	91	11388239	117.843	ng	97
68) Bromoform	18.24	173	1688045	71.501	ng	99
69) Styrene	18.50	104	5381381	68.941	ng	98
70) o-Xylene	18.61	91	5169229	55.047	ng	96
71) n-Nonane	18.80	43	3983221	67.044	ng	94
72) 1,1,2,2-Tetrachloroethane	18.58	83	3023688	63.402	ng	100
74) Cumene	19.13	105	7858943	64.189	ng	99
75) alpha-Pinene	19.48	93	4052631	91.347	ng	99
76) n-Propylbenzene	19.58	91	9126736	61.476	ng	100
77) 3-Ethyltoluene	19.67	105	7035383	59.262	ng	98
78) 4-Ethyltoluene	19.71	105	5809953	53.167	ng	97
79) 1,3,5-Trimethylbenzene	19.77	105	5448710	56.007	ng	96
80) alpha-Methylstyrene	19.91	118	3274723	67.743	ng	99
81) 2-Ethyltoluene	19.95	105	5732886	51.177	ng	97
82) 1,2,4-Trimethylbenzene	20.14	105	4872128	50.514	ng	98
83) n-Decane	20.23	57	3014196	55.592	ng	97
84) Benzyl Chloride	20.26	91	4401212	63.616	ng	99
85) 1,3-Dichlorobenzene	20.28	146	2718785	49.396	ng	100
86) 1,4-Dichlorobenzene	20.33	146	3045470	54.077	ng	100
87) sec-Butylbenzene	20.38	105	6163103	48.929	ng	98
88) 4-Isopropyltoluene (p-...	20.52	119	5691331	46.236	ng	96
89) 1,2,3-Trimethylbenzene	20.51	105	4812662	49.886	ng	99
90) 1,2-Dichlorobenzene	20.63	146	2801674	51.392	ng	100
91) d-Limonene	20.64	68	1465463	43.138	ng	89
92) 1,2-Dibromo-3-Chloropr...	21.01	157	1539605	76.255	ng	93
93) n-Undecane	21.33	57	3947386	70.940	ng	97
94) 1,2,4-Trichlorobenzene	22.14	180	2900160	77.242	ng	98
95) Naphthalene	22.24	128	6770625	58.591	ng	99
96) n-Dodecane	22.24	57	2398841	49.089	ng	96
97) Hexachlorobutadiene	22.56	225	1716380	73.127	ng	99
98) Cyclohexanone	18.31	55	2808360	66.574	ng	96
99) tert-Butylbenzene	20.14	119	4724259	50.300	ng	97
100) n-Butylbenzene	20.88	91	6621248	61.611	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071917.D
Acq On : 7 Nov 2019 13:43 Operator: LH
Sample : 100ng TO15 ICAL STD
Misc : S31-10161904/S31/10301901 (11/28)
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Nov 07 14:20:11 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:19:40 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071918.D
Acq On : 7 Nov 2019 14:16 Operator: LH
Sample : 25ng TO15 ICV STD
Misc : S31-10161904/S31-10241903 (11/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 07 14:45:28 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

LH 11/7/19

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	254451	12.500	ng		-0.01
37) 1,4-Difluorobenzene (IS2)	13.30	114	1059674	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	17.61	82	527177	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.03	65	393541	12.085	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.72%				
57) Toluene-d8 (SS2)	15.75	98	1159309	12.567	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.56%				
73) Bromofluorobenzene (SS3)	19.00	174	408560	12.397	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.20%				
Target Compounds							Qvalue
2) Propene	4.11	42	1051211	24.450	ng		100
3) Dichlorodifluoromethan...	4.26	85	1295084	24.516	ng		100
4) Chloromethane	4.54	50	929405	25.527	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	629118	24.021	ng		100
6) Vinyl Chloride	4.97	62	1020453	24.476	ng		100
7) 1,3-Butadiene	5.24	54	854808	27.176	ng		99
8) Bromomethane	5.67	94	623757	24.867	ng		99
9) Chloroethane	6.01	64	554584	25.149	ng		100
10) Ethanol	6.37	45	3089974	125.786	ng		100
11) Acetonitrile	6.62	41	1625448	26.581	ng		100
12) Acrolein	6.81	56	508656	26.126	ng		100
13) Acetone	7.02	58	2723448	119.145	ng		99
14) Trichlorofluoromethane	7.26	101	1120987	24.824	ng		100
15) 2-Propanol (Isopropanol)	7.51	45	3558709	54.516	ng		99
16) Acrylonitrile	7.78	53	1126374	27.415	ng		100
17) 1,1-Dichloroethene	8.23	96	690950	26.865	ng		97
18) 2-Methyl-2-Propanol (t...	8.38	59	2797187	59.684	ng		99
19) Methylene Chloride	8.45	84	711016	25.163	ng		97
20) 3-Chloro-1-propene (Al...	8.62	41	1199240	26.194	ng		99
21) Trichlorotrifluoroethane	8.87	151	605651	26.132	ng		98
22) Carbon Disulfide	8.71	76	2708730	27.033	ng		100
23) trans-1,2-Dichloroethene	9.73	61	1081244	26.992	ng		99
24) 1,1-Dichloroethane	9.98	63	1293542	25.152	ng		100
25) Methyl tert-Butyl Ether	10.07	73	1604778	27.830	ng		100
26) Vinyl Acetate	10.23	86	756460	178.096	ng	#	93
27) 2-Butanone (MEK)	10.47	72	504907	27.744	ng		96
28) cis-1,2-Dichloroethene	11.00	61	1026482	25.814	ng		99
29) Diisopropyl Ether	11.29	87	633831	26.819	ng		96
30) Ethyl Acetate	11.30	61	528423	54.967	ng		99
31) n-Hexane	11.28	57	1154557	24.990	ng		99
32) Chloroform	11.34	83	1110694	24.785	ng		100
34) Tetrahydrofuran (THF)	11.74	72	523732	27.753	ng		97
35) Ethyl tert-Butyl Ether	11.89	87	592679	26.987	ng		98
36) 1,2-Dichloroethane	12.14	62	896586	25.710	ng		100
38) 1,1,1-Trichloroethane	12.42	97	1035508	27.005	ng		99
39) Isopropyl Acetate	12.85	61	1002254	55.493	ng		98
40) 1-Butanol	12.87	56	1463174	62.360	ng		98
41) Benzene	12.90	78	2591625	24.163	ng		100
42) Carbon Tetrachloride	13.06	117	864576	27.725	ng		100
43) Cyclohexane	13.20	84	2055124	51.559	ng		99
44) tert-Amyl Methyl Ether	13.54	73	1530692	27.534	ng		99
45) 1,2-Dichloropropane	13.75	63	781568	26.726	ng		100
46) Bromodichloromethane	13.95	83	952719	27.751	ng		100
47) Trichloroethene	14.00	130	676382	25.826	ng		100
48) 1,4-Dioxane	13.97	88	579631	28.656	ng		99
49) 2,2,4-Trimethylpentane...	14.07	57	2917767	24.658	ng		100

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071918.D
Acq On : 7 Nov 2019 14:16 Operator: LH
Sample : 25ng TO15 ICV STD
Misc : S31-10161904/S31-10241903 (11/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 07 14:45:28 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

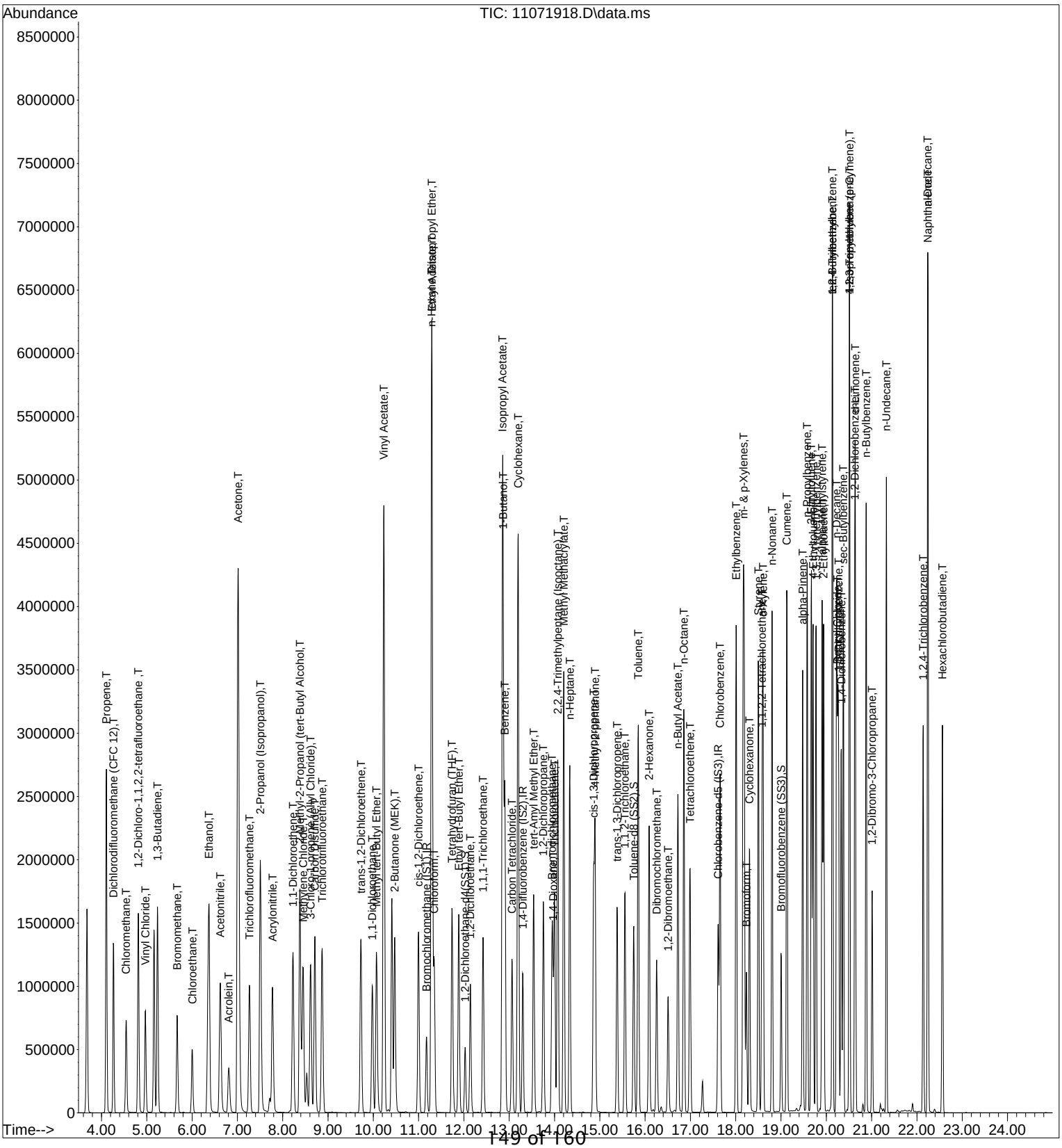
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.20	100	585143	58.601	ng	97
51) n-Heptane	14.34	71	718014	26.711	ng	99
52) cis-1,3-Dichloropropene	14.86	75	1281123	31.220	ng	100
53) 4-Methyl-2-pentanone	14.90	58	711388	28.058	ng	98
54) trans-1,3-Dichloropropene	15.38	75	1086513	30.954	ng	100
55) 1,1,2-Trichloroethane	15.55	97	684683	27.039	ng	100
58) Toluene	15.85	91	2698234	27.734	ng	100
59) 2-Hexanone	16.09	43	1881154	29.332	ng	99
60) Dibromochloromethane	16.26	129	791313	28.947	ng	100
61) 1,2-Dibromoethane	16.51	107	784310	27.997	ng	100
62) n-Butyl Acetate	16.72	43	2190516	29.954	ng	99
63) n-Octane	16.85	57	658900	26.517	ng	99
64) Tetrachloroethene	16.99	166	736351	25.324	ng	100
65) Chlorobenzene	17.65	112	1743022	25.476	ng	100
66) Ethylbenzene	18.01	91	3131910	26.457	ng	100
67) m- & p-Xylenes	18.17	91	4462683	50.371	ng	100
68) Bromoform	18.23	173	609850	29.872	ng	100
69) Styrene	18.50	104	1926459	28.069	ng	100
70) o-Xylene	18.60	91	2101795	25.035	ng	100
71) n-Nonane	18.80	43	1526811	25.418	ng	99
72) 1,1,2,2-Tetrachloroethane	18.58	83	1160549	25.916	ng	100
74) Cumene	19.13	105	2914421	26.406	ng	100
75) alpha-Pinene	19.48	93	1437061	26.349	ng	98
76) n-Propylbenzene	19.58	91	3529289	25.472	ng	100
77) 3-Ethyltoluene	19.67	105	2771683	25.817	ng	100
78) 4-Ethyltoluene	19.71	105	2458583	24.951	ng	100
79) 1,3,5-Trimethylbenzene	19.77	105	2182843	24.168	ng	100
80) alpha-Methylstyrene	19.91	118	1262147	27.925	ng	99
81) 2-Ethyltoluene	19.94	105	2515381	25.989	ng	100
82) 1,2,4-Trimethylbenzene	20.13	105	2153595	24.490	ng	100
83) n-Decane	20.23	57	1339707	24.237	ng	100
84) Benzyl Chloride	20.25	91	1825123	34.657	ng	100
85) 1,3-Dichlorobenzene	20.27	146	1227617	23.844	ng	99
86) 1,4-Dichlorobenzene	20.33	146	1285375	24.373	ng	100
87) sec-Butylbenzene	20.37	105	2791890	25.572	ng	100
88) 4-Isopropyltoluene (p-...	20.51	119	2553603	24.828	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	2077676	23.574	ng	100
90) 1,2-Dichlorobenzene	20.63	146	1255985	24.780	ng	100
91) d-Limonene	20.64	68	802978	24.239	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.01	157	525907	29.212	ng	98
93) n-Undecane	21.33	57	1564910	27.458	ng	99
94) 1,2,4-Trichlorobenzene	22.14	180	1048045	28.232	ng	100
95) Naphthalene	22.24	128	2900356	26.905	ng	100
96) n-Dodecane	22.24	57	1120938	24.701	ng	99
97) Hexachlorobutadiene	22.56	225	659050	25.726	ng	99
98) Cyclohexanone	18.30	55	997740	26.804	ng	99
99) tert-Butylbenzene	20.13	119	2042198	23.593	ng	100
100) n-Butylbenzene	20.88	91	2632966	26.102	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS16\DATA\2019_11\07\11071918.D
Acq On : 7 Nov 2019 14:16 Operator: LH
Sample : 25ng TO15 ICV STD
Misc : S31-10161904/S31-10241903 (11/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Nov 07 14:45:28 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **11071918.D** Acq. Method File: **TO15.M**
Data File Path: **I:\MS16\DATA\2019_11\07** Sample Name: **25ng TO15 ICV STD**
Operator: **LH** Misc Info: **S31-10161904/S31-10241903 (**
Date Acquired: **11/7/19** **14:16** Instrument Name: **GCMS-16**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	**Propene**	**4.11**	**24.5**	26.25	93	**53**	**112**	*	*
3)	**Dichlorodifluoromethane (CFC 1**	**4.26**	**24.5**	**26.25**	93	**62**	**103**	*	*
4)	**Chloromethane**	**4.54**	**25.5**	**26.50**	96	**51**	**121**	*	*
5)	**1,2-Dichloro-1,1,2,2-tetrafluoroet**	**4.81**	**24.0**	**25.75**	93	**56**	**111**	*	*
6)	**Vinyl Chloride**	**4.97**	**24.5**	**26.50**	92	**57**	**117**	*	*
7)	**1,3-Butadiene**	**5.24**	**27.2**	**26.50**	103	**53**	**134**	*	*
8)	**Bromomethane**	**5.67**	**24.9**	**26.50**	94	**65**	**110**	*	*
9)	**Chloroethane**	**6.01**	**25.1**	**26.75**	94	**64**	**111**	*	*
10)	**Ethanol**	**6.37**	**126**	**132.50**	95	**57**	**124**	*	*
11)	**Acetonitrile**	**6.62**	**26.6**	**26.75**	99	**57**	**126**	*	*
12)	**Acrolein**	**6.81**	**26.1**	**25.75**	101	**62**	**121**	*	*
13)	**Acetone**	**7.02**	**119**	**133.50**	89	**60**	**113**	*	*
14)	**Trichlorofluoromethane**	**7.26**	**24.8**	**26.50**	94	**63**	**104**	*	*
15)	**2-Propanol (Isopropanol)**	**7.51**	**54.5**	**52.75**	103	**60**	**124**	*	*
16)	**Acrylonitrile**	**7.78**	**27.4**	**26.50**	103	**66**	**125**	*	*
17)	**1,1-Dichloroethene**	**8.23**	**26.9**	**26.75**	101	**68**	**107**	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	8.38	59.7	53.75	111	64	114	*	*
19)	**Methylene Chloride**	**8.45**	**25.2**	**26.25**	96	**66**	**105**	*	*
20)	**3-Chloro-1-propene (Allyl Chloric**	**8.62**	**26.2**	**26.75**	98	**63**	**127**	*	*
21)	**Trichlorotrifluoroethane**	**8.87**	**26.1**	**27.00**	97	**59**	**109**	*	*
22)	**Carbon Disulfide**	**8.71**	**27.0**	**26.50**	102	**67**	**109**	*	*
23)	**trans-1,2-Dichloroethene**	**9.73**	**27.0**	**26.75**	101	**70**	**115**	*	*
24)	**1,1-Dichloroethane**	**9.98**	**25.2**	**26.50**	95	**66**	**106**	*	*
25)	**Methyl tert-Butyl Ether**	**10.07**	**27.8**	**26.75**	104	**67**	**109**	*	*
26)	**Vinyl Acetate**	**10.23**	**178**	**133.25**	134	**68**	**136**	*	*
27)	**2-Butanone (MEK)**	**10.47**	**27.7**	**26.50**	105	**71**	**116**	*	*
28)	**cis-1,2-Dichloroethene**	**11.00**	**25.8**	**26.50**	97	**67**	**110**	*	*
29)	Diisopropyl Ether	11.29	26.8	27.00	99	62	109	*	*
30)	**Ethyl Acetate**	**11.30**	**55.0**	**54.00**	102	**64**	**127**	*	*
31)	**n-Hexane**	**11.28**	**25.0**	**27.00**	93	**60**	**115**	*	*
32)	**Chloroform**	**11.34**	**24.8**	**26.75**	93	**66**	**105**	*	*
34)	**Tetrahydrofuran (THF)**	**11.74**	**27.8**	**27.50**	101	**65**	**110**	*	*
35)	Ethyl tert-Butyl Ether	11.89	27.0	26.75	101	69	109	*	*
36)	**1,2-Dichloroethane**	**12.14**	**25.7**	**26.75**	96	**60**	**110**	*	*
38)	**1,1,1-Trichloroethane**	**12.42**	**27.0**	**26.75**	101	**64**	**108**	*	*
39)	Isopropyl Acetate	12.85	55.5	52.50	106	66	119	*	*
40)	1-Butanol	12.87	62.4	53.25	117	54	143	*	*
41)	**Benzene**	**12.90**	**24.2**	**26.25**	92	**67**	**106**	*	*
42)	**Carbon Tetrachloride**	**13.06**	**27.7**	**26.00**	107	**64**	**112**	*	*
43)	**Cyclohexane**	**13.20**	**51.6**	**52.75**	98	**67**	**110**	*	*
44)	tert-Amyl Methyl Ether	13.54	27.5	**26.75**	103	68	112	*	*
45)	**1,2-Dichloropropane**	**13.75**	**26.7**	**26.75**	100	**66**	**112**	*	*
46)	**Bromodichloromethane**	**13.95**	**27.8**	**27.25**	102	**67**	**113**	*	*
47)	**Trichloroethene**	**14.00**	**25.8**	**27.00**	96	**66**	**108**	*	*
48)	**1,4-Dioxane**	**13.97**	**28.7**	**27.00**	106	**70**	**116**	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.07	24.7	26.75	92	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **11071918.D** **TO15.M**
Data File Path: **I:\MS16\DATA\2019_11\07** Sample Name: **25ng TO15 ICV STD**
Operator: **LH** Misc Info: **S31-10161904/S31-10241903 (**
Date Acquired: **11/7/19** **14:16** Instrument Name: **GCMS-16**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	**Methyl Methacrylate**	**14.20**	**58.6**	**53.75**	109	**73**	**118**	*	*
51)	**n-Heptane**	**14.34**	**26.7**	**26.75**	100	**66**	**110**	*	*
52)	**cis-1,3-Dichloropropene**	**14.86**	**31.2**	**26.75**	117	**75**	**120**	*	*
53)	**4-Methyl-2-pentanone**	**14.90**	**28.1**	**26.50**	106	**65**	**124**	*	*
54)	**trans-1,3-Dichloropropene**	**15.38**	**31.0**	**26.50**	117	**77**	**123**	*	*
55)	**1,1,2-Trichloroethane**	**15.55**	**27.0**	**26.75**	101	**68**	**112**	*	*
58)	**Toluene**	**15.85**	**27.7**	**26.50**	105	**62**	**111**	*	*
59)	**2-Hexanone**	**16.09**	**29.3**	**27.00**	109	**59**	**128**	*	*
60)	**Dibromochloromethane**	**16.26**	**28.9**	**26.75**	108	**67**	**123**	*	*
61)	**1,2-Dibromoethane**	**16.51**	**28.0**	**26.75**	105	**66**	**122**	*	*
62)	**n-Butyl Acetate**	**16.72**	**30.0**	**27.25**	110	**64**	**128**	*	*
63)	**n-Octane**	**16.85**	**26.5**	**27.00**	98	**65**	**114**	*	*
64)	**Tetrachloroethene**	**16.99**	**25.3**	**26.00**	97	**55**	**120**	*	*
65)	**Chlorobenzene**	**17.65**	**25.5**	**26.75**	95	**61**	**114**	*	*
66)	**Ethylbenzene**	**18.01**	**26.5**	**26.50**	100	**64**	**113**	*	*
67)	**m- & p-Xylenes**	**18.17**	**50.4**	**53.25**	95	**64**	**114**	*	*
68)	**Bromoform**	**18.24**	**29.9**	**26.75**	112	**65**	**132**	*	*
69)	**Styrene**	**18.50**	**28.1**	**26.50**	106	**67**	**124**	*	*
70)	**o-Xylene**	**18.60**	**25.0**	**26.75**	93	**65**	**114**	*	*
71)	**n-Nonane**	**18.80**	**25.4**	**26.75**	95	**64**	**117**	*	*
72)	**1,1,2,2-Tetrachloroethane**	**18.58**	**25.9**	**26.75**	97	**66**	**119**	*	*
74)	**Cumene**	**19.13**	**26.4**	**26.75**	99	**61**	**116**	*	*
75)	**alpha-Pinene**	**19.48**	**26.3**	**26.50**	99	**65**	**120**	*	*
76)	**n-Propylbenzene**	**19.58**	**25.5**	**26.75**	95	**63**	**117**	*	*
77)	3-Ethyltoluene	19.67	25.8	26.75	96	60	117	*	*
78)	**4-Ethyltoluene**	**19.71**	**25.0**	**26.25**	**95**	**63**	**124**	*	*
79)	**1,3,5-Trimethylbenzene**	**19.77**	**24.2**	**26.50**	**91**	**60**	**117**	*	*
80)	alpha-Methylstyrene	19.91	27.9	26.50	**105**	64	131	*	*
81)	2-Ethyltoluene	19.94	26.0	26.75	**97**	62	116	*	*
82)	**1,2,4-Trimethylbenzene**	**20.13**	**24.5**	**26.50**	**92**	**61**	**122**	*	*
83)	n-Decane	20.23	24.2	26.75	**90**	67	120	*	*
84)	**Benzyl Chloride**	**20.25**	**34.7**	**26.75**	**130**	**77**	**142**	*	*
85)	**1,3-Dichlorobenzene**	**20.27**	**23.8**	**26.75**	**89**	**61**	**125**	*	*
86)	**1,4-Dichlorobenzene**	**20.33**	**24.4**	**26.75**	**91**	**59**	**123**	*	*
87)	sec-Butylbenzene	20.37	25.6	26.50	**97**	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.51	24.8	27.25	**91**	58	122	*	*
89)	1,2,3-Trimethylbenzene	20.51	23.6	27.00	**87**	62	124	*	*
90)	**1,2-Dichlorobenzene**	**20.63**	**24.8**	**26.75**	**93**	**61**	**126**	*	*
91)	**d-Limonene**	**20.64**	**24.2**	**26.50**	**91**	**66**	**124**	*	*
92)	**1,2-Dibromo-3-Chloropropane**	**21.01**	**29.2**	**26.75**	**109**	**67**	**138**	*	*
93)	n-Undecane	21.33	27.5	27.00	**102**	68	127	*	*
94)	**1,2,4-Trichlorobenzene**	**22.14**	**28.2**	**27.00**	**104**	**62**	**141**	*	*
95)	**Naphthalene**	**22.24**	**26.9**	**26.50**	**102**	**62**	**145**	*	*
96)	n-Dodecane	22.24	24.7	26.50	**93**	64	152	*	*
97)	**Hexachlorobutadiene**	**22.56**	**25.7**	**26.75**	**96**	49	131	*	*
98)	Cyclohexanone	18.31	26.8	25.25	106	61	127	*	*
99)	tert-Butylbenzene	20.13	23.6	26.50	89	58	122	*	*
100)	n-Butylbenzene	20.88	26.1	26.75	98	64	121	*	*

Bold = 75 Compound List

 *** = Pass I:\MS16\0-Instrument Info\0-Security Certificates\ICV_LCS_2018_10111902.CRT** 11/7/19 2:46 PM

Evaluate Continuing Calibration Report

Data File : I:\MS16\DATA\2019_11\16\11161901.D Vial: 13
Acq On : 16 Nov 2019 00:48 Operator: LH
Sample : CCV R1611161901_25ng Inst : GCMS-16
Misc : S31-10161904/S31-10301904 (11/28)

Quant Time: Nov 16 07:27:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

11/16/19

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	IR	Bromochloromethane (IS1)	1.000	1.000	0.0	102	-0.01
2	T	Propene	2.112	1.756	16.9	87	-0.02
3	T	Dichlorodifluoromethane (CF	2.595	2.440	6.0	104	-0.01
4	T	Chloromethane	1.789	1.659	7.3	101	-0.02
5	T	1,2-Dichloro-1,1,2,2-tetraf	1.287	1.253	2.6	107	-0.02
6	T	Vinyl Chloride	2.048	1.926	6.0	103	-0.02
7	T	1,3-Butadiene	1.545	1.632	-5.6	104	-0.03
8	T	Bromomethane	1.232	1.124	8.8	98	-0.03
9	T	Chloroethane	1.083	0.947	12.6	94	-0.02
10	T	Ethanol	1.207	1.094	9.4	98	-0.08
11	T	Acetonitrile	3.004	2.741	8.8	95	-0.05
12	T	Acrolein	0.956	0.893	6.6	96	-0.03
13	T	Acetone	1.123	0.987	12.1	101	-0.04
14	T	Trichlorofluoromethane	2.218	2.078	6.3	103	-0.02
15	T	2-Propanol (Isopropanol)	3.207	3.406	-6.2	109	-0.05
16	T	Acrylonitrile	2.018	1.969	2.4	97	-0.03
17	T	1,1-Dichloroethene	1.263	1.218	3.6	102	-0.02
18	T	2-Methyl-2-Propanol (tert-B	2.302	2.915	-26.6	117	-0.04
19	T	Methylene Chloride	1.388	1.260	9.2	100	-0.02
20	T	3-Chloro-1-propene (Allyl C	2.249	1.986	11.7	90	-0.02
21	T	Trichlorotrifluoroethane	1.139	1.091	4.2	105	-0.01
22	T	Carbon Disulfide	4.922	4.682	4.9	99	-0.02
23	T	trans-1,2-Dichloroethene	1.968	1.846	6.2	98	-0.02
24	T	1,1-Dichloroethane	2.526	2.296	9.1	99	-0.02
25	T	Methyl tert-Butyl Ether	2.833	3.313	-16.9	117	-0.01
26	T	Vinyl Acetate	0.209	0.265	-26.8	100	-0.03
27	T	2-Butanone (MEK)	0.894	0.875	2.1	99	-0.02
28	T	cis-1,2-Dichloroethene	1.953	1.781	8.8	98	-0.02
29	T	Diisopropyl Ether	1.161	0.969	16.5	87	-0.01
30	T	Ethyl Acetate	0.472	0.451	4.4	97	-0.02
31	T	n-Hexane	2.270	1.973	13.1	96	0.00
32	T	Chloroform	2.201	1.947	11.5	100	-0.02
33	S	1,2-Dichloroethane-d4(SS1)	1.600	1.534	4.1	99	-0.01
34	T	Tetrahydrofuran (THF)	0.927	0.884	4.6	99	-0.01
35	T	Ethyl tert-Butyl Ether	1.079	1.220	-13.1	119	-0.01
36	T	1,2-Dichloroethane	1.713	1.604	6.4	102	-0.01
37	IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	98	-0.01
38	T	1,1,1-Trichloroethane	0.452	0.457	-1.1	101	0.00
39	T	Isopropyl Acetate	0.213	0.226	-6.1	100	-0.01
40	T	1-Butanol	0.277	0.334	-20.6	103	-0.03
41	T	Benzene	1.265	1.148	9.2	98	-0.01
42	T	Carbon Tetrachloride	0.368	0.390	-6.0	99	0.00
43	T	Cyclohexane	0.470	0.457	2.8	99	-0.01
44	T	tert-Amyl Methyl Ether	0.656	0.772	-17.7	117	0.00
45	T	1,2-Dichloropropane	0.345	0.326	5.5	95	0.00
46	T	Bromodichloromethane	0.405	0.420	-3.7	101	0.00
47	T	Trichloroethene	0.309	0.300	2.9	101	0.00
48	T	1,4-Dioxane	0.239	0.247	-3.3	100	-0.01
49	T	2,2,4-Trimethylpentane (Iso	1.396	1.249	10.5	95	0.00
50	T	Methyl Methacrylate	0.118	0.126	-6.8	101	-0.01
51	T	n-Heptane	0.317	0.305	3.8	97	0.00
52	T	cis-1,3-Dichloropropene	0.484	0.533	-10.1	99	0.00
53	T	4-Methyl-2-pentanone	0.299	0.307	-2.7	96	-0.01
54	T	trans-1,3-Dichloropropene	0.414	0.472	-14.0	100	0.00
55	T	1,1,2-Trichloroethane	0.299	0.297	0.7	99	-0.01

Evaluate Continuing Calibration Report

Data File : I:\MS16\DATA\2019_11\16\11161901.D Vial: 13
Acq On : 16 Nov 2019 00:48 Operator: LH
Sample : CCV R1611161901_25ng Inst : GCMS-16
Misc : S31-10161904/S31-10301904 (11/28)

Quant Time: Nov 16 07:27:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
56	IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	97	0.00
57	S	Toluene-d8 (SS2)	2.187	2.141	2.1	95	0.00
58	T	Toluene	2.307	2.335	-1.2	99	0.00
59	T	2-Hexanone	1.521	1.665	-9.5	98	-0.01
60	T	Dibromochloromethane	0.648	0.721	-11.3	102	0.00
61	T	1,2-Dibromoethane	0.664	0.697	-5.0	101	0.00
62	T	n-Butyl Acetate	1.734	1.896	-9.3	97	0.00
63	T	n-Octane	0.589	0.569	3.4	97	0.00
64	T	Tetrachloroethene	0.689	0.691	-0.3	104	0.00
65	T	Chlorobenzene	1.622	1.569	3.3	101	0.00
66	T	Ethylbenzene	2.807	2.778	1.0	100	0.00
67	T	m- & p-Xylenes	2.101	2.017	4.0	101	0.00
68	T	Bromoform	0.484	0.570	-17.8	105	0.00
69	T	Styrene	1.627	1.738	-6.8	101	0.00
70	T	o-Xylene	1.991	1.910	4.1	100	0.00
71	T	n-Nonane	1.424	1.371	3.7	97	0.00
72	T	1,1,2,2-Tetrachloroethane	1.062	1.040	2.1	100	0.00
73	S	Bromofluorobenzene (SS3)	0.781	0.778	0.4	98	0.00
74	T	Cumene	2.617	2.629	-0.5	101	0.00
75	T	alpha-Pinene	1.293	1.366	-5.6	105	0.00
76	T	n-Propylbenzene	3.285	3.174	3.4	101	0.00
77	T	3-Ethyltoluene	2.546	2.513	1.3	101	0.00
78	T	4-Ethyltoluene	2.336	2.314	0.9	102	0.00
79	T	1,3,5-Trimethylbenzene	2.142	2.024	5.5	102	0.00
80	T	alpha-Methylstyrene	1.072	1.171	-9.2	102	0.00
81	T	2-Ethyltoluene	2.295	2.277	0.8	101	0.00
82	T	1,2,4-Trimethylbenzene	2.085	1.956	6.2	100	-0.01
83	T	n-Decane	1.311	1.226	6.5	99	0.00
84	T	Benzyl Chloride	1.249	1.660	-32.9#	104	-0.01
85	T	1,3-Dichlorobenzene	1.221	1.146	6.1	103	0.00
86	T	1,4-Dichlorobenzene	1.250	1.206	3.5	104	0.00
87	T	sec-Butylbenzene	2.589	2.576	0.5	101	0.00
88	T	4-Isopropyltoluene (p-Cymen	2.439	2.288	6.2	99	0.00
89	T	1,2,3-Trimethylbenzene	2.090	1.908	8.7	99	0.00
90	T	1,2-Dichlorobenzene	1.202	1.171	2.6	104	0.00
91	T	d-Limonene	0.785	0.740	5.7	98	0.00
92	T	1,2-Dibromo-3-Chloropropane	0.427	0.496	-16.2	102	0.00
93	T	n-Undecane	1.351	1.368	-1.3	94	0.00
94	T	1,2,4-Trichlorobenzene	0.880	0.992	-12.7	103	0.00
95	T	Naphthalene	2.556	2.766	-8.2	99	0.00
96	T	n-Dodecane	1.076	1.054	2.0	87	0.00
97	T	Hexachlorobutadiene	0.607	0.621	-2.3	103	0.00
98	T	Cyclohexanone	0.883	0.962	-8.9	102	-0.01
99	T	tert-Butylbenzene	2.052	1.877	8.5	100	0.00
100	T	n-Butylbenzene	2.392	2.337	2.3	98	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161901.D Vial: 13
Acq On : 16 Nov 2019 00:48 Operator: LH
Sample : CCV R1611161901_25ng Inst : GCMS-16
Misc : S31-10161904/S31-10301904 (11/28)

Quant Time: Nov 16 07:27:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019 11/16/19
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	11.17	130	249043	12.500	ng		-0.01
37) 1,4-Difluorobenzene (IS2)	13.30	114	990629	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	17.61	82	488858	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	12.03	65	381970	11.984	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.84%				
57) Toluene-d8 (SS2)	15.75	98	1046739	12.236	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.92%				
73) Bromofluorobenzene (SS3)	19.00	174	380156	12.440	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.52%				
Target Compounds							Qvalue
2) Propene	4.10	42	926888	22.027	ng		99
3) Dichlorodifluoromethan...	4.26	85	1288288	24.917	ng		100
4) Chloromethane	4.54	50	876107	24.585	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	655292	25.563	ng		100
6) Vinyl Chloride	4.97	62	1035986	25.389	ng		100
7) 1,3-Butadiene	5.23	54	861461	27.982	ng		98
8) Bromomethane	5.66	94	604714	24.631	ng		99
9) Chloroethane	6.00	64	509449	23.604	ng		100
10) Ethanol	6.36	45	2839108	118.083	ng		100
11) Acetonitrile	6.62	41	1433569	23.952	ng		100
12) Acrolein	6.81	56	457898	24.030	ng		100
13) Acetone	7.01	58	2620093	117.113	ng		97
14) Trichlorofluoromethane	7.26	101	1097092	24.823	ng		100
15) 2-Propanol (Isopropanol)	7.50	45	3562789	55.763	ng		100
16) Acrylonitrile	7.77	53	1030013	25.614	ng		99
17) 1,1-Dichloroethene	8.22	96	654972	26.019	ng		96
18) 2-Methyl-2-Propanol (t...	8.37	59	3136584	68.379	ng		98
19) Methylene Chloride	8.45	84	665445	24.062	ng		96
20) 3-Chloro-1-propene (Al...	8.61	41	1068457	23.844	ng		95
21) Trichlorotrifluoroethane	8.86	151	586744	25.866	ng		95
22) Carbon Disulfide	8.71	76	2495443	25.445	ng		100
23) trans-1,2-Dichloroethene	9.72	61	993282	25.335	ng		96
24) 1,1-Dichloroethane	9.98	63	1246751	24.768	ng		100
25) Methyl tert-Butyl Ether	10.07	73	1782217	31.579	ng		99
26) Vinyl Acetate	10.23	86	705173	169.626	ng	#	83
27) 2-Butanone (MEK)	10.47	72	462190	25.949	ng	#	90
28) cis-1,2-Dichloroethene	10.99	61	940414	24.163	ng		96
29) Diisopropyl Ether	11.29	87	521452	22.543	ng	#	82
30) Ethyl Acetate	11.30	61	486988	51.757	ng		98
31) n-Hexane	11.28	57	1061294	23.470	ng		99
32) Chloroform	11.34	83	1037519	23.655	ng		100
34) Tetrahydrofuran (THF)	11.74	72	480131	25.995	ng		96
35) Ethyl tert-Butyl Ether	11.88	87	656498	30.542	ng		96
36) 1,2-Dichloroethane	12.14	62	863110	25.288	ng		99
38) 1,1,1-Trichloroethane	12.42	97	968262	27.012	ng		100
39) Isopropyl Acetate	12.85	61	945504	55.999	ng		99
40) 1-Butanol	12.87	56	1376261	62.744	ng		99
41) Benzene	12.90	78	2410277	24.039	ng		100
42) Carbon Tetrachloride	13.06	117	811682	27.843	ng		99
43) Cyclohexane	13.19	84	1920512	51.540	ng		97
44) tert-Amyl Methyl Ether	13.54	73	1651399	31.776	ng		99
45) 1,2-Dichloropropane	13.75	63	696620	25.481	ng		100
46) Bromodichloromethane	13.95	83	898864	28.007	ng		100
47) Trichloroethene	14.00	130	636308	25.989	ng		100
48) 1,4-Dioxane	13.97	88	527910	27.918	ng		96
49) 2,2,4-Trimethylpentane...	14.07	57	2647759	23.936	ng		98
50) Methyl Methacrylate	14.20	100	538713	57.712	ng		98

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161901.D Vial: 13
Acq On : 16 Nov 2019 00:48 Operator: LH
Sample : CCV R1611161901_25ng Inst : GCMS-16
Misc : S31-10161904/S31-10301904 (11/28)

Quant Time: Nov 16 07:27:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

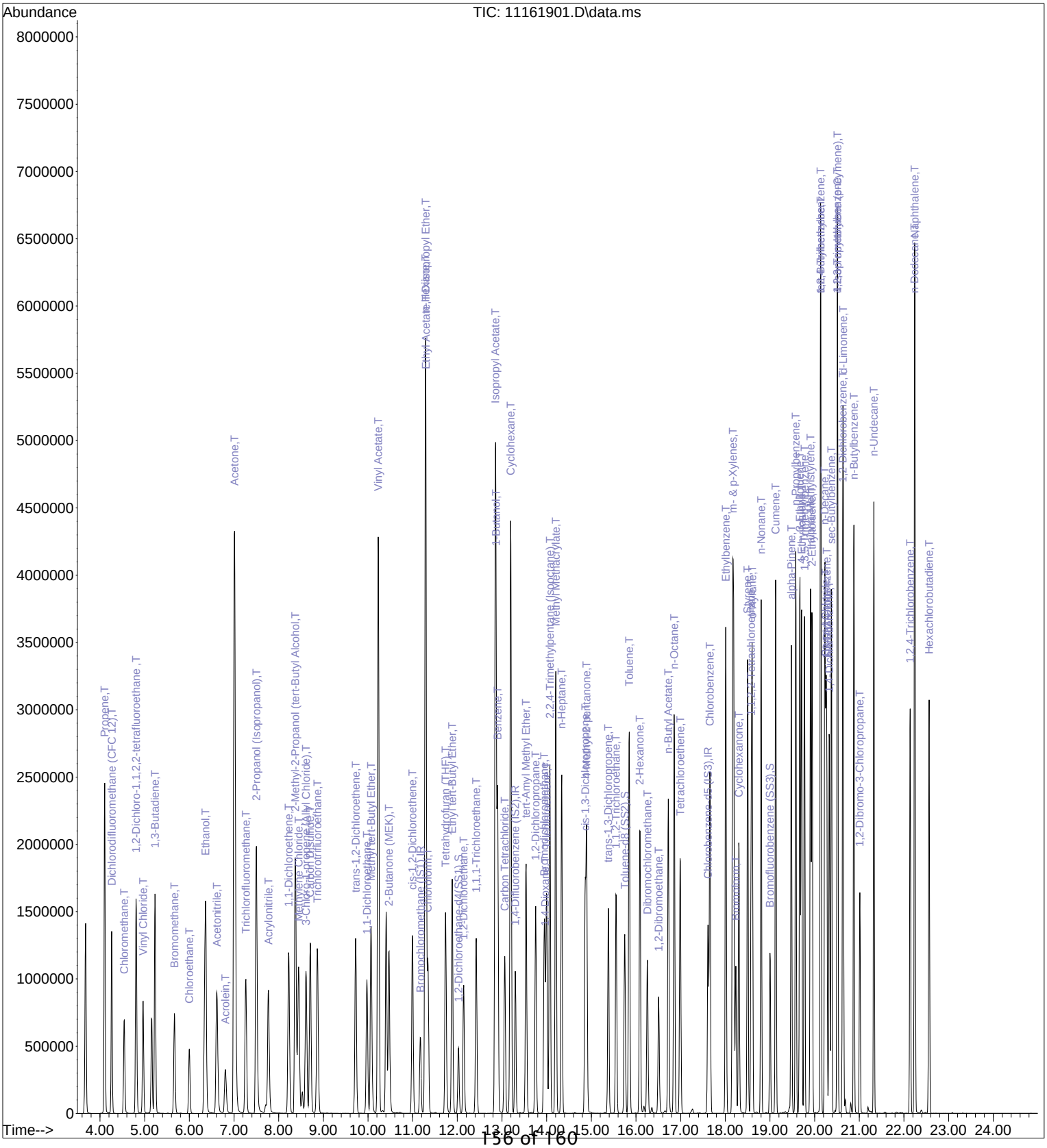
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
51) n-Heptane	14.34	71	652408	25.962	ng	99
52) cis-1,3-Dichloropropene	14.86	75	1098221	28.628	ng	100
53) 4-Methyl-2-pentanone	14.89	58	643938	27.168	ng	99
54) trans-1,3-Dichloropropene	15.38	75	990398	30.182	ng	100
55) 1,1,2-Trichloroethane	15.55	97	629072	26.574	ng	99
58) Toluene	15.85	91	2442795	27.076	ng	100
59) 2-Hexanone	16.09	43	1741973	29.291	ng	100
60) Dibromochloromethane	16.26	129	753812	29.736	ng	100
61) 1,2-Dibromoethane	16.51	107	728945	28.061	ng	100
62) n-Butyl Acetate	16.72	43	2020072	29.788	ng	99
63) n-Octane	16.86	57	600311	26.053	ng	98
64) Tetrachloroethene	16.99	166	702313	26.046	ng	100
65) Chlorobenzene	17.65	112	1641626	25.875	ng	100
66) Ethylbenzene	18.01	91	2906413	26.477	ng	100
67) m- & p-Xylenes	18.17	91	4220201	51.367	ng	100
68) Bromoform	18.24	173	595847	31.474	ng	100
69) Styrene	18.50	104	1800871	28.296	ng	100
70) o-Xylene	18.60	91	1998142	25.666	ng	100
71) n-Nonane	18.80	43	1433988	25.744	ng	99
72) 1,1,2,2-Tetrachloroethane	18.58	83	1087996	26.200	ng	100
74) Cumene	19.13	105	2776002	27.123	ng	100
75) alpha-Pinene	19.48	93	1429011	28.256	ng	99
76) n-Propylbenzene	19.58	91	3351794	26.087	ng	100
77) 3-Ethyltoluene	19.67	105	2604708	26.163	ng	99
78) 4-Ethyltoluene	19.71	105	2443115	26.738	ng	100
79) 1,3,5-Trimethylbenzene	19.77	105	2097275	25.040	ng	99
80) alpha-Methylstyrene	19.91	118	1224579	29.218	ng	99
81) 2-Ethyltoluene	19.94	105	2404749	26.793	ng	100
82) 1,2,4-Trimethylbenzene	20.13	105	2045890	25.089	ng	99
83) n-Decane	20.23	57	1282312	25.017	ng	99
84) Benzyl Chloride	20.25	91	1752979	35.897	ng	99
85) 1,3-Dichlorobenzene	20.27	146	1199319	25.120	ng	100
86) 1,4-Dichlorobenzene	20.33	146	1261678	25.799	ng	100
87) sec-Butylbenzene	20.37	105	2694468	26.614	ng	99
88) 4-Isopropyltoluene (p-...	20.51	119	2437908	25.561	ng	100
89) 1,2,3-Trimethylbenzene	20.51	105	2033454	24.881	ng	100
90) 1,2-Dichlorobenzene	20.63	146	1224606	26.055	ng	100
91) d-Limonene	20.64	68	781451	25.438	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.01	157	509156	30.498	ng	96
93) n-Undecane	21.33	57	1444312	27.329	ng	99
94) 1,2,4-Trichlorobenzene	22.14	180	1038143	30.157	ng	99
95) Naphthalene	22.24	128	2785132	27.861	ng	100
96) n-Dodecane	22.24	57	1071867	25.471	ng	98
97) Hexachlorobutadiene	22.56	225	643906	27.105	ng	100
98) Cyclohexanone	18.30	55	941026	27.262	ng	99
99) tert-Butylbenzene	20.13	119	1963900	24.467	ng	100
100) n-Butylbenzene	20.88	91	2444664	26.135	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File : I:\MS16\DATA\2019_11\16\11161901.D Vial: 13
Acq On : 16 Nov 2019 00:48 Operator: LH
Sample : CCV R1611161901_25ng Inst : GCMS-16
Misc : S31-10161904/S31-10301904 (11/28)

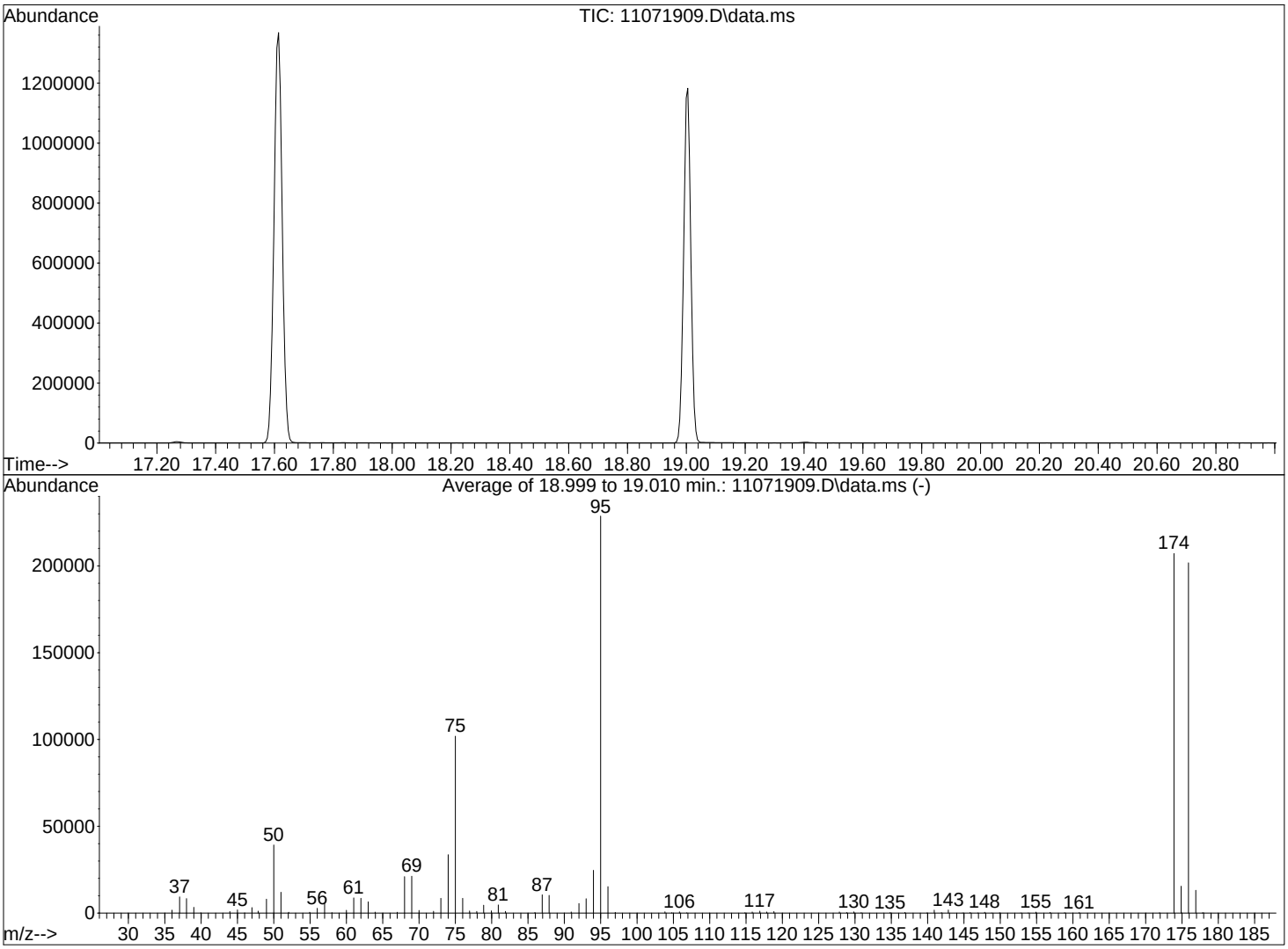
Quant Time: Nov 16 07:27:09 2019
Quant Method : I:\MS16\METHODS\R16110719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Thu Nov 07 14:29:49 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data Path : I:\MS16\DATA\2019_11\07\
Data File : 11071909.D
Acq On : 7 Nov 2019 9:19
Operator : LH
Sample : 12.5ng TO15 BFB
Misc : S31-10161904
ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16110719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Nov 07 14:19:40 2019



AutoFind: Scans 2821, 2822, 2823; Background Corrected with Scan 2813

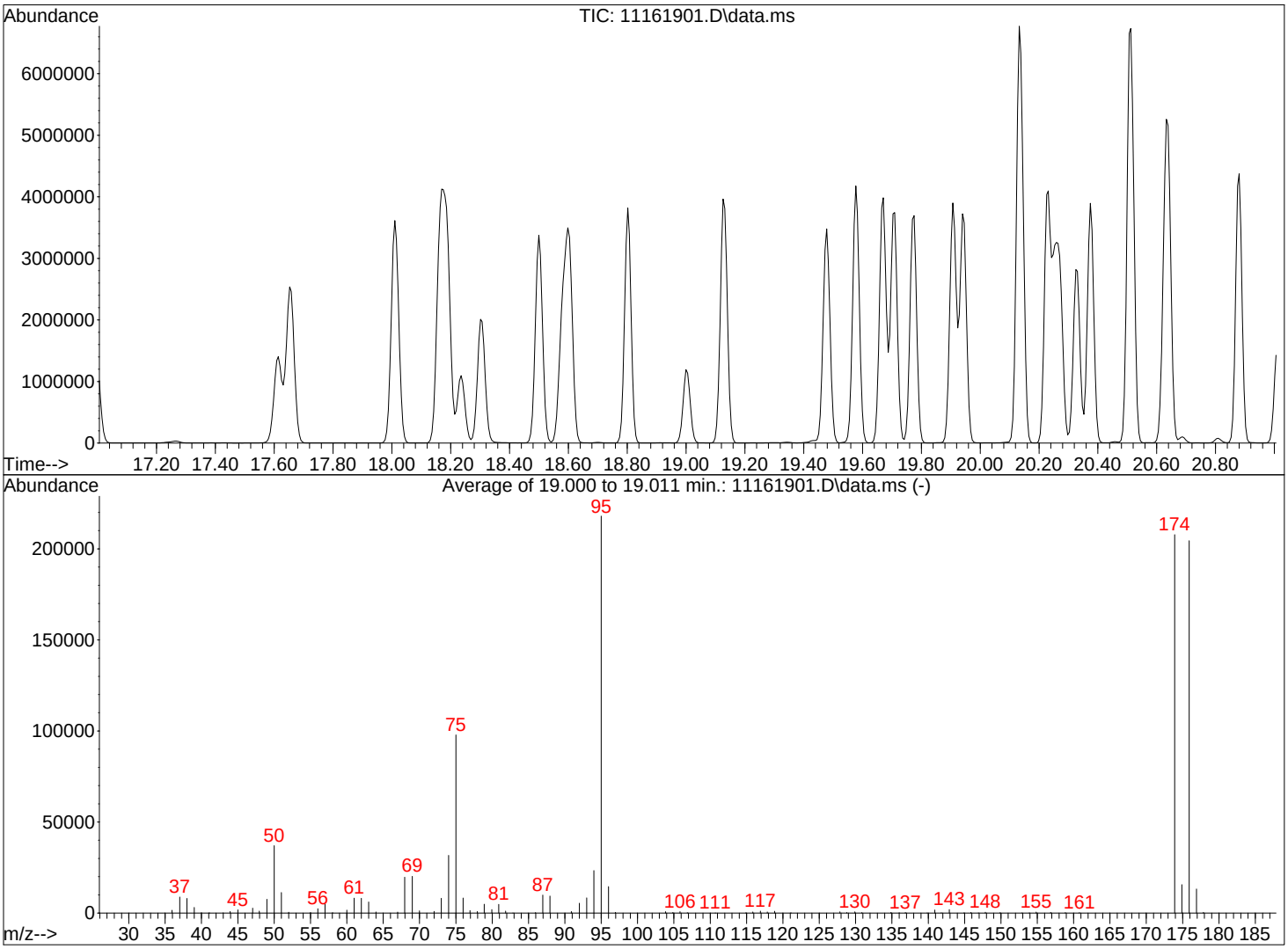
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.2	39240	PASS
75	95	30	66	44.6	101933	PASS
95	95	100	100	100.0	228672	PASS
96	95	5	9	6.7	15282	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	90.6	207125	PASS
175	174	4	9	7.5	15494	PASS
176	174	93	101	97.4	201792	PASS
177	176	5	9	6.5	13148	PASS

LH 11/7/19

Data Path : I:\MS16\DATA\2019_11\16\
Data File : 11161901.D
Acq On : 16 Nov 2019 00:48
Operator : LH
Sample : CCV R1611161901_25ng
Misc : S31-10161904/S31-10301904 (11/28)
ALS Vial : 13 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16110719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Thu Nov 07 14:29:49 2019



AutoFind: Scans 2821, 2822, 2823; Background Corrected with Scan 2812

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	17.0	37019	PASS
75	95	30	66	44.9	97800	PASS
95	95	100	100	100.0	217984	PASS
96	95	5	9	6.7	14499	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	95.3	207829	PASS
175	174	4	9	7.5	15602	PASS
176	174	93	101	98.4	204480	PASS
177	176	5	9	6.5	13234	PASS

11/16/19

Injection Log

Directory: J:\MS16\DATA\2019_11\07\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
9	11/7/19 9:19	11071909.D	12.5ng TO15 BFB	S31-10161904	LH	2	
10	11/7/19 9:52	11071910.D	0.1ng TO15 ICAL STD	S31-10161904/S31/11061902 (12/5)	LH	5	
11	11/7/19 10:25	11071911.D	0.2ng TO15 ICAL STD	S31-10161904/S31/11061902 (12/5)	LH	5	
12	11/7/19 10:58	11071912.D	0.5ng TO15 ICAL STD	S31-10161904/S31/11061902 (12/5)	LH	5	
13	11/7/19 11:31	11071913.D	1.0ng TO15 ICAL STD	S31-10161904/S31/11061902 (12/5)	LH	5	
14	11/7/19 12:04	11071914.D	5.0ng TO15 ICAL STD	S31-10161904/S31/11051901 (12/4)	LH	6	
15	11/7/19 12:37	11071915.D	25ng TO15 ICAL STD	S31-10161904/S31/10301901 (11/28)	LH	7	
16	11/7/19 13:10	11071916.D	50ng TO15 ICAL STD	S31-10161904/S31/10301901 (11/28)	LH	7	
17	11/7/19 13:43	11071917.D	100ng TO15 ICAL STD	S31-10161904/S31/10301901 (11/28)	LH	7	
18	11/7/19 14:16	11071918.D	25ng TO15 ICV STD	S31-10161904/S31-10241903 (11/22)	LH	2	
	ICAL R16110719.M passed for all compounds 0.1ng-100ng, except: chloromethane 0.2ng-50ng, acetonitrile, carbon disulfide, toluene						
	trans-1,3-dichloropropene, 2-ethyltoluene, sec-butylbenzene 0.5ng-100ng, o-xylene, 3-ethyltoluene, 4-ethyltoluene, 4-isopropyltoluene 0.2ng-100ng,						
	benzyl chloride 1.0ng-100ng.						
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LH 11/7/19

Injection Log

Directory: I:\MS16\DATA\2019_11\16\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	11/16/19 0:48	11161901.D	CCV R1611161901_25ng	S31-10161904/S31-10301904 (11/28)	LH	13	pass
2	11/16/19 1:21	11161902.D	Blank_100mL	S31-10161904	LH	2	
3	11/16/19 1:55	11161903.D	MB R16111619_1000mL	S31-10161904/SC01319	LH	2	pass
4	11/16/19 2:28	11161904.D	LCS R16111619_ 25ng	S31-10161904/S31-10241903 (11/22)	LH	2	pass
5	11/16/19 3:01	11161905.D	LCSD R16111619_25ng	S31-10161904/S31-10241903 (11/22)	LH	2	pass
6	11/16/19 3:34	11161906.D	P1906526-007 (400mL)	S31-10161904	LH	2	
7	11/16/19 4:07	11161907.D	P1906526-008 (400mL)	S31-10161904	LH	14	
8	11/16/19 4:41	11161908.D	P1906526-009 (400mL)	S31-10161904	LH	15	
9	11/16/19 5:14	11161909.D	P1906658-001 (400mL)	S31-10161904	LH	16	
10	11/16/19 5:47	11161910.D	P1906658-002 (400mL)	S31-10161904	LH	3	
11	11/16/19 6:20	11161911.D	P1906658-002dil (40mL)	S31-10161904	LH	4	
12	11/16/19 8:04	11161912.D	P1906429-004 (400mL)	S31-10161904	LH	6	
13	11/16/19 8:37	11161913.D	P1906431-003 (400mL)	S31-10161904	LH	7	
14	11/16/19 9:29	11161914.D	P1906526-003 (50mL)	S31-10161904	WA	10	
15	11/16/19 11:24	11161915.D	Blank	S31-10161904	WA	1	
16	11/16/19 11:57	11161916.D	P1906559-001 (1000mL)	S31-10161904	WA	3	
17	11/16/19 12:31	11161917.D	P1906559-001dup (1000mL)	S31-10161904	WA	3	pass
18	11/16/19 13:04	11161918.D	P1906559-002 (1000mL)	S31-10161904	WA	4	
19	11/16/19 13:38	11161919.D	P1906559-003 (1000mL)	S31-10161904 pf2	WA	12	
20	11/16/19 14:11	11161920.D	P1906657-001 (400mL)	S31-10161904	WA	5	
21	11/16/19 14:45	11161921.D	P1906657-002 (400mL)	S31-10161904	WA	6	
22	11/16/19 15:18	11161922.D	P1906657-003 (400mL)	S31-10161904	WA	7	
23	11/16/19 15:52	11161923.D	P1906657-003dil (40mL)	S31-10161904	WA	7	
24	11/16/19 16:25	11161924.D	P1906657-004 (400mL)	S31-10161904	WA	8	
25	11/16/19 16:58	11161925.D	P1906657-005 (400mL)	S31-10161904	WA	9	
26	11/16/19 17:32	11161926.D	P1906657-006 (400mL)	S31-10161904	WA	10	
27	11/16/19 18:05	11161927.D	P1906657-006dil (40mL)	S31-10161904	WA	10	
28	11/16/19 18:39	11161928.D	P1906657-007 (400mL)	S31-10161904	WA	11	
29	11/16/19 19:12	11161929.D	P1906660-001 (400mL)	S31-10161904	WA	16	
30	11/17/19 2:35	11161931.D	System	S31-10161904	WA	1	
							11/17/19

DATA VALIDATION

FOR

LEHIGH VALLEY RAILROAD DERAILMENT SUPERFUND SITE
LEROY, NEW YORK

ORGANIC ANALYSIS DATA
Volatile Organic Compounds in Air

Laboratory Service Request No. P1906559

Analyses Performed By:

ALS Environmental
Simi Valley, California

For:

Unicorn Management Consultants, Inc.
52 Federal Road, Suite 2C
Danbury, Connecticut 06810

Data Validation By:

ddms, inc.
St. Paul, Minnesota 55108

December 16, 2019

2111-0001/ekd/das
LVRR\P1906559 VOCs.docx

EXECUTIVE SUMMARY

Validation of the volatile organic analysis data prepared by ALS Environmental for three air samples from the Lehigh Valley Railroad Derailment Superfund Site has been completed by de maximis Data Management Solutions, Inc. (ddms). Stage 4 validation was performed on the samples. The data were reported by the laboratory under Service Request No. P1906559. The following samples were reported:

G07-04	Dup102319	G07-Outdoor

Based on the validation effort, the following data qualifiers were applied:

- Results for chloromethane in G-07-04, Dup102319, and G07-Outdoor were qualified as estimated (UJ) due to the high recovery for this analyte in the associated laboratory control sample (LCS).

All other results were determined to be valid as reported by the laboratory.

This report should be considered part of the data package for all future distributions of the data.

INTRODUCTION

Analyses were performed in accordance with USEPA Method TO-15. The laboratory provided a Level 4 data package for review.

ddms' validation was performed in conformance with the USEPA Region 2 Standard Operating Procedure (SOP) No. HW-31, "Analysis of Volatile Organic Compounds in Air Contained in Canisters by Method TO-15" (Revision 6, September 2016), the site-specific Quality Assurance Project Plan (QAPP) dated January 2015, ddms SOP ECS-001, and the analytical method. Professional judgment was applied as necessary and appropriate.

The data validation process is intended to evaluate data on a technical basis rather than a contract compliance basis for chemical analyses conducted under the referenced methods. It is assumed that the data package represents the best efforts of the laboratory and has already been subjected to sufficient quality review prior to submission for validation.

During the validation process, laboratory data are verified against all available supporting documentation. Based on the findings of the evaluation, qualifier codes may be added by the data validator. Validated results are, therefore, either qualified or unqualified. Unqualified results mean that the reported values may be used without reservation. Final validated results are annotated with the following codes as defined by Region 2:

U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.

J The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

J+ The result is an estimated quantity, but the result may be biased high.

J- The result is an estimated quantity, but the result may be biased low.

NJ The analysis indicates the presence of an analyte the has been "tentatively identified" and the associated numerical value represents its approximate concentration.

UJ The analyte was analyzed for, but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

R The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.

All data users should note two facts. First, the "R" qualifier means that the laboratory-reported value is unusable. In other words, due to significant quality control problems, the analysis is invalid and provides no information as to whether the analyte is present or not. Rejected values should not appear on data tables because they cannot be relied upon, even as a last resort. Second, no concentration is guaranteed to be accurate even if all associated quality control is acceptable. Strict quality control conformance serves only to increase confidence in reported results; any analytical result will always contain some error.

The data user is also cautioned that the validation effort is based on the raw data printouts as provided by the laboratory. Software manipulation cannot be routinely detected during validation; unless otherwise stated in the report, these kinds of issues are outside the scope of this review.

I. Holding Times, Preservation and Sample Integrity

A copy of the applicable chain of custody (COC) record was included in the data package documenting a sample collection date of October 23, 2019. The samples were received at the laboratory on October 29, 2019.

Both samples were analyzed within the method holding time of 30 days from collection.

II. Documentation

No documentation issues were observed during the validation effort.

The remainder of this report discusses the review effort for each of the parameters. The table below documents the Quality Control (QC) parameters reviewed. Only those quality control excursions resulting in qualified data are discussed below. Quality control excursions having no impact to sample results are not discussed. Where a result was qualified J+ or J- and J, the J qualifier takes precedence. Where a result was qualified biased high and low for differing data quality excursions, the final qualifier is J with an indeterminate bias.

III. Volatile Organic Compounds

Review Element	Acceptable?
GC/MS Instrument Tunes	Y
Calibration - IC, ICV, CC	Y
Laboratory and Field Blanks	Y
Surrogates	Y
LCS/LCSD	N
Laboratory Duplicates	Y
Field Duplicates	Y
MS/MSD	N/A
Internal Standard Responses	Y
Compound Identification	Y

N/A = not applicable

A. Laboratory Control Sample

Recoveries of the target compounds were within the acceptance limits of 70-130% except for chloromethane (65%). Results for chloromethane in G-07-04, Dup102319, and G07-Outdoor were quaified as estimated (UJ) due to the high recovery for this analyte in the associated LCS.

ATTACHMENT A

DATA SUMMARY FORMS
Service Request No. P1906559

DATA SUMMARY FORM: VOLATILES 1
AIR SAMPLES
(ug/m3)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

MRL		Sample ID		Sample ID		Sample ID							
		Laboratory Sample ID		Laboratory Sample ID		Laboratory Sample ID							
		Dilution Factor		Dilution Factor		Dilution Factor							
0.53	Propene	2.4		2.5		0.96							
0.53	Dichlorodifluoromethane	2.4		2.4		1.9							
0.21	Chloromethane		UJ		UJ		UJ						
0.53	1,2-Dichloro-1,1,2,2-tetrafdluoroethane												
0.11	Vinyl chloride												
0.21	1,3-Butadiene												
0.22	Bromomethane												
0.22	Chloroethane												
5.2	Ethanol	36		36		1.8	J						
0.53	Acetonitrile												
1.0	Acrolein			0.21	J								
5.3	Acetone	12		12		2.7	J						
0.53	Trichlorofluoromethane	1.8		1.8		1.0							
2.1	2-Propanol	7.3		7.5		3.4							
0.53	Acrylonitrile												
0.11	1,1-Dichloroethene												
0.53	Methylene chloride												
0.54	3-Chloro-1-propene												
0.5	Trichlorotrifluoroethane	0.61	J	0.60	J	0.46	J						
1.1	Carbon disulfide	0.87	J	0.85	J	0.33	J						
0.11	trans-1,2-Dichloroethene												
0.11	1,1-Dichloroethane												
0.54	Methyl tert-butyl ether												
5.4	Vinyl aceetate												
1.1	2-Butanone	0.69	J	0.55	J	0.31	J						

.

DATA SUMMARY FORM: VOLATILES 1
AIR SAMPLES
(ug/m3)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

	Sample ID	G07-04		Dup102319		G07-Outdoor							
	Laboratory Sample ID	P1906559-001		P1906559-002		P1906559-003							
	Dilution Factor	1.51		1.42		1.36							
MRL													
0.11	cis-1,2-Dichloroethene												
1.1	Ethyl acetate	0.89	J	0.98	J	0.79	J						
0.54	n-Hexane	13		13									
0.11	Chloroform	0.26		0.27									
0.55	Tetrahydrofuran												
0.11	1,2-Dichloroethane												
0.11	1,1,1-Trichloroethane												
0.11	Benzene	1.1		1.1		0.14	J						
0.11	Carbon tetrachloride	0.22		0.24		0.36							
1.10	Cyclohexane	15		15									
0.11	1,2-Dichloropropane												
0.11	Bromodichloromethane												
0.11	Trichloroethene					0.19							
0.54	1,4-Dioxane												
1.1	Methyl methacrylate												
0.54	n-Heptane	8.0		8.0									
0.52	cis-1,3-Dichloropropene												
0.53	4-Methyl-2-pentanone	0.44	J	0.23	J								
0.53	trans-1,3-Dichloropropene												
0.11	1,1,2-Trichloroethane												
0.54	Toluene	2.4		2.7		0.21	J						
0.54	2-Hexanone												
0.11	Dibromochloromethane												
0.11	1,2-Dibromoethane												
0.55	n-Butyl acetate	0.71	J										

DATA SUMMARY FORM: VOLATILES 2
AIR SAMPLES
(ug/m3)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

	Sample ID	G07-04		Dup102319		G07-Outdoor									
	Laboratory Sample ID	P1906559-001		P1906559-002		P1906559-003									
	Dilution Factor	1.51		1.42		1.36									
MRL															
0.54	n-Octane	4.5		4.4											
0.10	Tetrachloroethene	0.40		0.42											
0.54	Chlorobenzene														
0.54	Ethylbenzene	0.68	J	0.41	J										
1.1	m,p-Xylenes	3.5		2.2											
0.54	Bromoform														
0.53	Styrene														
0.54	o-Xylene	1.0		0.84											
0.54	n-Nonane	2.2		2.2											
0.11	1,1,2,2-Tetrachloroethane														
0.54	Cumene	0.12	J	0.13	J										
0.54	alpha-Pinene	0.60	J	0.58	J	0.11	J								
0.54	n-Propylbenzene			0.14	J										
0.54	4-Ethyltoluene														
0.53	1,3,5-Trimethylbenzene	0.32	J	0.39	J										
0.53	1,2,4-Trimethylbenzene	0.45	J	0.70	J										
1.1	1,2,4-Trichlorobenzene														
0.54	Benzyl chloride														
0.54	1,3-Dichlorobenzene														
0.54	1,4-Dchlorobenzene														
0.54	d-Limonene	1.2		1.2											
0.53	1,2-Dibromo-3-chloropropane														
0.54	1,2,4-Trichlorobenzene														
0.52	Naphthalene														
0.53	Hexachlorobutadiene														

DATA SUMMARY FORM: VOLATILES 1
AIR SAMPLES
(ppbv)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

MRL		Sample ID		Sample ID		Sample ID							
		Laboratory Sample ID		Laboratory Sample ID		Laboratory Sample ID							
		Dilution Factor		Dilution Factor		Dilution Factor							
		G07-04		Dup102319		G07-Outdoor							
		P1906559-001		P1906559-002		P1906559-003							
		1.51		1.42		1.36							
0.31	Propene	1.4		1.4		0.56							
0.11	Dichlorodifluoromethane	0.49		0.48		0.39							
0.10	Chloromethane		UJ		UJ		UJ						
0.076	1,2-Dichloro-1,1,2,2-tetrafdluoroethane												
0.043	Vinyl chloride												
0.10	1,3-Butadiene												
0.057	Bromomethane												
0.083	Chloroethane												
2.8	Ethanol	19		19		0.95	J						
0.32	Acetonitrile												
0.44	Acrolein			0.094	J								
2.2	Acetone	5.2		5.2		1.1	J						
0.094	Trichlorofluoromethane	0.32		0.31		0.18							
0.85	2-Propanol	3.0		3.0		1.4							
0.24	Acrylonitrile												
0.028	1,1-Dichloroethene												
0.15	Methylene chloride												
0.17	3-Chloro-1-propene												
0.070	Trichlorotrifluoroethane	0.079	J	0.078	J	0.059	J						
0.35	Carbon disulfide	0.28	J	0.27	J	0.11	J						
0.03	trans-1,2-Dichloroethene												
0.03	1,1-Dichloroethane												
0.15	Methyl tert-butyl ether												
1.5	Vinyl aceetate												
0.37	2-Butanone	0.23	J	0.19	J	0.11	J						

DATA SUMMARY FORM: VOLATILES 1
AIR SAMPLES
(ppbv)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

MRL		Sample ID		G07-04		Dup102319		G07-Outdoor					
		Laboratory Sample ID		P1906559-001		P1906559-002		P1906559-003					
		Dilution Factor		1.51		1.42		1.36					
0.028	cis-1,2-Dichloroethene												
0.31	Ethyl acetate		0.25	J	0.27	J	0.22	J					
0.15	n-Hexane		3.6		3.6								
0.023	Chloroform		0.054		0.054								
0.19	Tetrahydrofuran												
0.027	1,2-Dichloroethane												
0.020	1,1,1-Trichloroethane												
0.034	Benzene		0.33		0.35		0.045	J					
0.017	Carbon tetrachloride		0.036		0.038		0.057						
0.32	Cyclohexane		4.3		4.3								
0.024	1,2-Dichloropropane												
0.016	Bromodichloromethane												
0.02	Trichloroethene						0.036						
0.15	1,4-Dioxane												
0.27	Methyl methacrylate												
0.13	n-Heptane		2.0		2.0								
0.11	cis-1,3-Dichloropropene												
0.13	4-Methyl-2-pentanone		0.11	J	0.056	J							
0.12	trans-1,3-Dichloropropene												
0.020	1,1,2-Trichloroethane												
0.14	Toluene		0.64		0.71		0.057	J					
0.13	2-Hexanone												
0.013	Dibromochloromethane												
0.014	1,2-Dibromoethane												
0.120	n-Butyl acetate		0.15	J									

DATA SUMMARY FORM: VOLATILES 2
AIR SAMPLES
(ppbv)

Site Name: Lehigh Valley Railroad Site

Sampling Date: October 23, 2019

Laboratory Service Request No. P1906559

ddms Project No. 2111.0001

MRL		Sample ID		Sample ID		Sample ID							
		Laboratory Sample ID		Laboratory Sample ID		Laboratory Sample ID							
		Dilution Factor		Dilution Factor		Dilution Factor							
0.12	n-Octane	0.96		0.95									
0.015	Tetrachloroethene	0.058		0.061									
0.12	Chlorobenzene												
0.12	Ethylbenzene	0.16	J	0.094	J								
0.25	m,p-Xylenes	0.80		0.50									
0.052	Bromoform												
0.12	Styrene												
0.12	o-Xylene	0.24		0.19									
0.10	n-Nonane	0.42		0.43									
0.016	1,1,2,2-Tetrachloroethane												
0.11	Cumene	0.024	J	0.027	J								
0.10	alpha-Pinene	0.11	J	0.10	J	0.021	J						
0.11	n-Propylbenzene			0.029	J								
0.11	4-Ethyltoluene												
0.11	1,3,5-Trimethylbenzene	0.065	J	0.079	J								
0.11	1,2,4-Trimethylbenzene	0.092	J	0.14	J								
0.21	1,2,4-Trichlorobenzene												
0.090	Benzyl chloride												
0.090	1,3-Dichlorobenzene												
0.090	1,4-Dchlorobenzene												
0.097	d-Limonene	0.22		0.21									
0.055	1,2-Dibromo-3-chloropropane												
0.073	1,2,4-Trichlorobenzene												
0.099	Naphthalene												
0.050	Hexachlorobutadiene												

ATTACHMENT B

ANALYSIS REPORTS
Service Request No. P1906559

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-001

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01406

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**2.4**	0.80	0.20	**1.4**	0.47	0.11	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.4**	0.80	0.13	**0.49**	0.16	0.027	
74-87-3	Chloromethane	ND WJ	0.32	0.13	ND WJ	0.15	0.063	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.80	0.13	ND	0.11	0.018	
75-01-4	Vinyl Chloride	ND	0.17	0.086	ND	0.065	0.034	
106-99-0	1,3-Butadiene	ND	0.32	0.13	ND	0.14	0.060	
74-83-9	Bromomethane	ND	0.33	0.11	ND	0.086	0.029	
75-00-3	Chloroethane	ND	0.33	0.10	ND	0.13	0.038	
64-17-5	Ethanol	**36**	7.9	0.56	**19**	4.2	0.30	
75-05-8	Acetonitrile	ND	0.80	0.20	ND	0.48	0.12	
107-02-8	Acrolein	ND	1.5	0.23	ND	0.66	0.099	
67-64-1	Acetone	**12**	8.0	1.8	**5.2**	3.4	0.76	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.8**	0.80	0.12	**0.32**	0.14	0.022	
67-63-0	2-Propanol (Isopropyl Alcohol)	**7.3**	3.2	0.33	**3.0**	1.3	0.14	
107-13-1	Acrylonitrile	ND	0.80	0.17	ND	0.37	0.077	
75-35-4	1,1-Dichloroethene	ND	0.17	0.11	ND	0.042	0.028	
75-09-2	Methylene Chloride	ND	0.80	0.23	ND	0.23	0.065	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.82	0.11	ND	0.26	0.035	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.61**	0.82	0.11	**0.079**	0.11	0.015	**J**
75-15-0	Carbon Disulfide	**0.87**	1.7	0.24	**0.28**	0.53	0.078	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.17	0.11	ND	0.042	0.028	
75-34-3	1,1-Dichloroethane	ND	0.17	0.12	ND	0.041	0.029	
1634-04-4	Methyl tert-Butyl Ether	ND	0.82	0.095	ND	0.23	0.026	
108-05-4	Vinyl Acetate	ND	8.2	1.8	ND	2.3	0.51	
78-93-3	2-Butanone (MEK)	**0.69**	1.7	0.17	**0.23**	0.56	0.056	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit. E-Dec 12/16/19
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS01406

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.17	0.11	ND	0.042	0.029	
141-78-6	Ethyl Acetate	**0.89**	1.7	0.42	**0.25**	0.46	0.12	**J**
110-54-3	n-Hexane	**13**	0.82	0.17	**3.6**	0.23	0.047	
67-66-3	Chloroform	**0.26**	0.17	0.11	**0.054**	0.034	0.022	
109-99-9	Tetrahydrofuran (THF)	ND	0.83	0.10	ND	0.28	0.034	
107-06-2	1,2-Dichloroethane	ND	0.17	0.089	ND	0.041	0.022	
71-55-6	1,1,1-Trichloroethane	ND	0.17	0.10	ND	0.030	0.018	
71-43-2	Benzene	**1.1**	0.17	0.12	**0.33**	0.052	0.036	
56-23-5	Carbon Tetrachloride	**0.22**	0.17	0.11	**0.036**	0.026	0.018	
110-82-7	Cyclohexane	**15**	1.7	0.23	**4.3**	0.48	0.066	
78-87-5	1,2-Dichloropropane	ND	0.17	0.10	ND	0.036	0.022	
75-27-4	Bromodichloromethane	ND	0.17	0.12	ND	0.025	0.017	
79-01-6	Trichloroethene	ND	0.17	0.11	ND	0.031	0.020	
123-91-1	1,4-Dioxane	ND	0.82	0.095	ND	0.23	0.026	
80-62-6	Methyl Methacrylate	ND	1.7	0.29	ND	0.41	0.070	
142-82-5	n-Heptane	**8.0**	0.82	0.13	**2.0**	0.20	0.031	
10061-01-5	cis-1,3-Dichloropropene	ND	0.79	0.13	ND	0.17	0.028	
108-10-1	4-Methyl-2-pentanone	**0.44**	0.80	0.11	**0.11**	0.20	0.027	**J**
10061-02-6	trans-1,3-Dichloropropene	ND	0.80	0.17	ND	0.18	0.037	
79-00-5	1,1,2-Trichloroethane	ND	0.17	0.082	ND	0.030	0.015	
108-88-3	Toluene	**2.4**	0.82	0.098	**0.64**	0.22	0.026	
591-78-6	2-Hexanone	ND	0.82	0.10	ND	0.20	0.024	
124-48-1	Dibromochloromethane	ND	0.17	0.11	ND	0.020	0.012	
106-93-4	1,2-Dibromoethane	ND	0.17	0.094	ND	0.022	0.012	
123-86-4	n-Butyl Acetate	**0.71**	0.83	0.11	**0.15**	0.17	0.023	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-04**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-001

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS01406

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.69 Final Pressure (psig): 4.89

Canister Dilution Factor: 1.51

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	**4.5**	0.82	0.18	**0.96**	0.17	0.039	
127-18-4	Tetrachloroethene	**0.40**	0.15	0.10	**0.058**	0.022	0.015	
108-90-7	Chlorobenzene	ND	0.82	0.11	ND	0.18	0.023	
100-41-4	Ethylbenzene	**0.68**	0.82	0.11	**0.16**	0.19	0.026	**J**
179601-23-1	m,p-Xylenes	**3.5**	1.7	0.21	**0.80**	0.38	0.049	
75-25-2	Bromoform	ND	0.82	0.17	ND	0.079	0.016	
100-42-5	Styrene	ND	0.80	0.13	ND	0.19	0.031	
95-47-6	o-Xylene	**1.0**	0.82	0.12	**0.24**	0.19	0.027	
111-84-2	n-Nonane	**2.2**	0.82	0.13	**0.42**	0.16	0.026	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.17	0.11	ND	0.024	0.016	
98-82-8	Cumene	**0.12**	0.82	0.12	**0.024**	0.17	0.024	**J**
80-56-8	alpha-Pinene	**0.60**	0.82	0.12	**0.11**	0.15	0.022	**J**
103-65-1	n-Propylbenzene	ND	0.82	0.12	ND	0.17	0.024	
622-96-8	4-Ethyltoluene	ND	0.82	0.13	ND	0.17	0.026	
108-67-8	1,3,5-Trimethylbenzene	**0.32**	0.80	0.12	**0.065**	0.16	0.024	**J**
95-63-6	1,2,4-Trimethylbenzene	**0.45**	0.80	0.11	**0.092**	0.16	0.023	**J**
100-44-7	Benzyl Chloride	ND	1.7	0.18	ND	0.32	0.035	
541-73-1	1,3-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.020	
106-46-7	1,4-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.021	
95-50-1	1,2-Dichlorobenzene	ND	0.82	0.12	ND	0.14	0.020	
5989-27-5	d-Limonene	**1.2**	0.82	0.17	**0.22**	0.15	0.030	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.80	0.15	ND	0.083	0.016	
120-82-1	1,2,4-Trichlorobenzene	ND	0.82	0.20	ND	0.11	0.026	
91-20-3	Naphthalene	ND	0.79	0.20	ND	0.15	0.037	
87-68-3	Hexachlorobutadiene	ND	0.80	0.17	ND	0.075	0.016	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-002

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS00982

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**2.5**	0.75	0.18	**1.4**	0.44	0.11	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.4**	0.75	0.12	**0.48**	0.15	0.025	
74-87-3	Chloromethane	ND UJ	0.30	0.12	ND UJ	0.14	0.059	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	0.12	ND	0.11	0.017	
75-01-4	Vinyl Chloride	ND	0.16	0.081	ND	0.061	0.032	
106-99-0	1,3-Butadiene	ND	0.30	0.12	ND	0.13	0.057	
74-83-9	Bromomethane	ND	0.31	0.11	ND	0.080	0.027	
75-00-3	Chloroethane	ND	0.31	0.094	ND	0.12	0.036	
64-17-5	Ethanol	**36**	7.4	0.53	**19**	3.9	0.28	
75-05-8	Acetonitrile	ND	0.75	0.18	ND	0.45	0.11	
107-02-8	Acrolein	**0.21**	1.4	0.21	**0.094**	0.62	0.093	**J**
67-64-1	Acetone	**12**	7.5	1.7	**5.2**	3.2	0.72	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.8**	0.75	0.12	**0.31**	0.13	0.020	
67-63-0	2-Propanol (Isopropyl Alcohol)	**7.5**	3.0	0.31	**3.0**	1.2	0.13	
107-13-1	Acrylonitrile	ND	0.75	0.16	ND	0.35	0.072	
75-35-4	1,1-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
75-09-2	Methylene Chloride	ND	0.75	0.21	ND	0.22	0.061	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.77	0.10	ND	0.25	0.033	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.60**	0.77	0.11	**0.078**	0.10	0.014	**J**
75-15-0	Carbon Disulfide	**0.85**	1.6	0.23	**0.27**	0.50	0.073	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
75-34-3	1,1-Dichloroethane	ND	0.16	0.11	ND	0.039	0.027	
1634-04-4	Methyl tert-Butyl Ether	ND	0.77	0.089	ND	0.21	0.025	
108-05-4	Vinyl Acetate	ND	7.7	1.7	ND	2.2	0.48	
78-93-3	2-Butanone (MEK)	**0.55**	1.6	0.16	**0.19**	0.53	0.053	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit. E. Dich 12/16/19
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-002

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS00982

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.11	ND	0.039	0.027	
141-78-6	Ethyl Acetate	**0.98**	1.6	0.40	**0.27**	0.43	0.11	**J**
110-54-3	n-Hexane	**13**	0.77	0.16	**3.6**	0.22	0.044	
67-66-3	Chloroform	**0.27**	0.16	0.10	**0.054**	0.032	0.021	
109-99-9	Tetrahydrofuran (THF)	ND	0.78	0.095	ND	0.26	0.032	
107-06-2	1,2-Dichloroethane	ND	0.16	0.084	ND	0.039	0.021	
71-55-6	1,1,1-Trichloroethane	ND	0.16	0.094	ND	0.029	0.017	
71-43-2	Benzene	**1.1**	0.16	0.11	**0.35**	0.049	0.034	
56-23-5	Carbon Tetrachloride	**0.24**	0.16	0.11	**0.038**	0.025	0.017	
110-82-7	Cyclohexane	**15**	1.6	0.21	**4.3**	0.45	0.062	
78-87-5	1,2-Dichloropropane	ND	0.16	0.094	ND	0.034	0.020	
75-27-4	Bromodichloromethane	ND	0.16	0.11	ND	0.023	0.016	
79-01-6	Trichloroethene	ND	0.16	0.10	ND	0.029	0.019	
123-91-1	1,4-Dioxane	ND	0.77	0.089	ND	0.21	0.025	
80-62-6	Methyl Methacrylate	ND	1.6	0.27	ND	0.38	0.066	
142-82-5	n-Heptane	**8.0**	0.77	0.12	**2.0**	0.19	0.029	
10061-01-5	cis-1,3-Dichloropropene	ND	0.74	0.12	ND	0.16	0.026	
108-10-1	4-Methyl-2-pentanone	**0.23**	0.75	0.10	**0.056**	0.18	0.025	**J**
10061-02-6	trans-1,3-Dichloropropene	ND	0.75	0.16	ND	0.17	0.034	
79-00-5	1,1,2-Trichloroethane	ND	0.16	0.077	ND	0.029	0.014	
108-88-3	Toluene	**2.7**	0.77	0.092	**0.71**	0.20	0.025	
591-78-6	2-Hexanone	ND	0.77	0.094	ND	0.19	0.023	
124-48-1	Dibromochloromethane	ND	0.16	0.099	ND	0.018	0.012	
106-93-4	1,2-Dibromoethane	ND	0.16	0.088	ND	0.020	0.011	
123-86-4	n-Butyl Acetate	ND	0.78	0.10	ND	0.16	0.022	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **Dup102319**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-002

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS00982

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.76 Final Pressure (psig): 3.66

Canister Dilution Factor: 1.42

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	**4.4**	0.77	0.17	**0.95**	0.16	0.036	
127-18-4	Tetrachloroethene	**0.42**	0.14	0.098	**0.061**	0.021	0.014	
108-90-7	Chlorobenzene	ND	0.77	0.10	ND	0.17	0.022	
100-41-4	Ethylbenzene	**0.41**	0.77	0.11	**0.094**	0.18	0.025	**J**
179601-23-1	m,p-Xylenes	**2.2**	1.6	0.20	**0.50**	0.36	0.046	
75-25-2	Bromoform	ND	0.77	0.16	ND	0.074	0.015	
100-42-5	Styrene	ND	0.75	0.12	ND	0.18	0.029	
95-47-6	o-Xylene	**0.84**	0.77	0.11	**0.19**	0.18	0.025	
111-84-2	n-Nonane	**2.2**	0.77	0.13	**0.43**	0.15	0.024	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.16	0.11	ND	0.023	0.015	
98-82-8	Cumene	**0.13**	0.77	0.11	**0.027**	0.16	0.022	**J**
80-56-8	alpha-Pinene	**0.58**	0.77	0.12	**0.10**	0.14	0.021	**J**
103-65-1	n-Propylbenzene	**0.14**	0.77	0.11	**0.029**	0.16	0.022	**J**
622-96-8	4-Ethyltoluene	ND	0.77	0.12	ND	0.16	0.025	
108-67-8	1,3,5-Trimethylbenzene	**0.39**	0.75	0.11	**0.079**	0.15	0.022	**J**
95-63-6	1,2,4-Trimethylbenzene	**0.70**	0.75	0.11	**0.14**	0.15	0.021	**J**
100-44-7	Benzyl Chloride	ND	1.6	0.17	ND	0.30	0.033	
541-73-1	1,3-Dichlorobenzene	ND	0.77	0.11	ND	0.13	0.019	
106-46-7	1,4-Dichlorobenzene	ND	0.77	0.12	ND	0.13	0.019	
95-50-1	1,2-Dichlorobenzene	ND	0.77	0.11	ND	0.13	0.019	
5989-27-5	d-Limonene	**1.2**	0.77	0.16	**0.21**	0.14	0.028	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.75	0.14	ND	0.078	0.015	
120-82-1	1,2,4-Trichlorobenzene	ND	0.77	0.18	ND	0.10	0.025	
91-20-3	Naphthalene	ND	0.74	0.18	ND	0.14	0.035	
87-68-3	Hexachlorobutadiene	ND	0.75	0.16	ND	0.071	0.015	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS01087

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
115-07-1	Propene	**0.96**	0.72	0.18	**0.56**	0.42	0.10	
75-71-8	Dichlorodifluoromethane (CFC 12)	**1.9**	0.72	0.12	**0.39**	0.15	0.024	
74-87-3	Chloromethane	ND UJ	0.29	0.12	ND UJ	0.14	0.057	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.72	0.11	ND	0.10	0.016	
75-01-4	Vinyl Chloride	ND	0.15	0.078	ND	0.059	0.030	
106-99-0	1,3-Butadiene	ND	0.29	0.12	ND	0.13	0.054	
74-83-9	Bromomethane	ND	0.30	0.10	ND	0.077	0.026	
75-00-3	Chloroethane	ND	0.30	0.090	ND	0.11	0.034	
64-17-5	Ethanol	**1.8**	7.1	0.50	**0.95**	3.8	0.27	**J**
75-05-8	Acetonitrile	ND	0.72	0.18	ND	0.43	0.11	
107-02-8	Acrolein	ND	1.4	0.20	ND	0.59	0.089	
67-64-1	Acetone	**2.7**	7.2	1.6	**1.1**	3.0	0.69	**J**
75-69-4	Trichlorofluoromethane (CFC 11)	**1.0**	0.72	0.11	**0.18**	0.13	0.020	
67-63-0	2-Propanol (Isopropyl Alcohol)	**3.4**	2.9	0.30	**1.4**	1.2	0.12	
107-13-1	Acrylonitrile	ND	0.72	0.15	ND	0.33	0.069	
75-35-4	1,1-Dichloroethene	ND	0.15	0.10	ND	0.038	0.025	
75-09-2	Methylene Chloride	ND	0.72	0.20	ND	0.21	0.059	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.73	0.098	ND	0.23	0.031	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.46**	0.73	0.10	**0.059**	0.096	0.013	**J**
75-15-0	Carbon Disulfide	**0.33**	1.5	0.22	**0.11**	0.48	0.070	**J**
156-60-5	trans-1,2-Dichloroethene	ND	0.15	0.10	ND	0.038	0.025	
75-34-3	1,1-Dichloroethane	ND	0.15	0.11	ND	0.037	0.026	
1634-04-4	Methyl tert-Butyl Ether	ND	0.73	0.086	ND	0.20	0.024	
108-05-4	Vinyl Acetate	ND	7.3	1.6	ND	2.1	0.46	
78-93-3	2-Butanone (MEK)	**0.31**	1.5	0.15	**0.11**	0.51	0.051	**J**

ND = Compound was analyzed for, but not detected above the laboratory detection limit. E. Dick 12/16/19
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor**
Client Project ID: **LVRR Soil Gas / 2032-770**

ALS Project ID: P1906559
ALS Sample ID: P1906559-003

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16
Analyst: Wida Ang
Sample Type: 6.0 L Silonite Canister
Test Notes:
Container ID: AS01087

Date Collected: 10/23/19
Date Received: 10/29/19
Date Analyzed: 11/16/19
Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.15	0.10	ND	0.038	0.026	
141-78-6	Ethyl Acetate	**0.79**	1.5	0.38	**0.22**	0.42	0.11	**J**
110-54-3	n-Hexane	ND	0.73	0.15	ND	0.21	0.042	
67-66-3	Chloroform	ND	0.15	0.097	ND	0.031	0.020	
109-99-9	Tetrahydrofuran (THF)	ND	0.75	0.091	ND	0.25	0.031	
107-06-2	1,2-Dichloroethane	ND	0.15	0.080	ND	0.037	0.020	
71-55-6	1,1,1-Trichloroethane	ND	0.15	0.090	ND	0.027	0.016	
71-43-2	Benzene	**0.14**	0.15	0.10	**0.045**	0.047	0.033	**J**
56-23-5	Carbon Tetrachloride	**0.36**	0.15	0.10	**0.057**	0.024	0.016	
110-82-7	Cyclohexane	ND	1.5	0.20	ND	0.43	0.059	
78-87-5	1,2-Dichloropropane	ND	0.15	0.090	ND	0.032	0.019	
75-27-4	Bromodichloromethane	ND	0.15	0.10	ND	0.022	0.016	
79-01-6	Trichloroethene	**0.19**	0.15	0.098	**0.036**	0.028	0.018	
123-91-1	1,4-Dioxane	ND	0.73	0.086	ND	0.20	0.024	
80-62-6	Methyl Methacrylate	ND	1.5	0.26	ND	0.37	0.063	
142-82-5	n-Heptane	ND	0.73	0.12	ND	0.18	0.028	
10061-01-5	cis-1,3-Dichloropropene	ND	0.71	0.11	ND	0.16	0.025	
108-10-1	4-Methyl-2-pentanone	ND	0.72	0.099	ND	0.18	0.024	
10061-02-6	trans-1,3-Dichloropropene	ND	0.72	0.15	ND	0.16	0.033	
79-00-5	1,1,2-Trichloroethane	ND	0.15	0.073	ND	0.027	0.013	
108-88-3	Toluene	**0.21**	0.73	0.088	**0.057**	0.19	0.023	**J**
591-78-6	2-Hexanone	ND	0.73	0.090	ND	0.18	0.022	
124-48-1	Dibromochloromethane	ND	0.15	0.095	ND	0.018	0.011	
106-93-4	1,2-Dibromoethane	ND	0.15	0.084	ND	0.019	0.011	
123-86-4	n-Butyl Acetate	ND	0.75	0.099	ND	0.16	0.021	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

Client: **Unicorn Management Consultants**
Client Sample ID: **G07-Outdoor** ALS Project ID: P1906559
Client Project ID: **LVRR Soil Gas / 2032-770** ALS Sample ID: P1906559-003

Test Code: EPA TO-15 Date Collected: 10/23/19
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Date Received: 10/29/19
Analyst: Wida Ang Date Analyzed: 11/16/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AS01087

Initial Pressure (psig): -1.18 Final Pressure (psig): 3.70

Canister Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.73	0.16	ND	0.16	0.035	
127-18-4	Tetrachloroethene	ND	0.14	0.094	ND	0.020	0.014	
108-90-7	Chlorobenzene	ND	0.73	0.097	ND	0.16	0.021	
100-41-4	Ethylbenzene	ND	0.73	0.10	ND	0.17	0.023	
179601-23-1	m,p-Xylenes	ND	1.5	0.19	ND	0.34	0.044	
75-25-2	Bromoform	ND	0.73	0.15	ND	0.071	0.014	
100-42-5	Styrene	ND	0.72	0.12	ND	0.17	0.027	
95-47-6	o-Xylene	ND	0.73	0.10	ND	0.17	0.024	
111-84-2	n-Nonane	ND	0.73	0.12	ND	0.14	0.023	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.15	0.10	ND	0.022	0.015	
98-82-8	Cumene	ND	0.73	0.10	ND	0.15	0.021	
80-56-8	alpha-Pinene	**0.11**	0.73	0.11	**0.021**	0.13	0.020	**J**
103-65-1	n-Propylbenzene	ND	0.73	0.10	ND	0.15	0.021	
622-96-8	4-Ethyltoluene	ND	0.73	0.12	ND	0.15	0.024	
108-67-8	1,3,5-Trimethylbenzene	ND	0.72	0.10	ND	0.15	0.021	
95-63-6	1,2,4-Trimethylbenzene	ND	0.72	0.10	ND	0.15	0.020	
100-44-7	Benzyl Chloride	ND	1.5	0.16	ND	0.29	0.032	
541-73-1	1,3-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.018	
106-46-7	1,4-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.019	
95-50-1	1,2-Dichlorobenzene	ND	0.73	0.11	ND	0.12	0.018	
5989-27-5	d-Limonene	ND	0.73	0.15	ND	0.13	0.027	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.72	0.14	ND	0.075	0.014	
120-82-1	1,2,4-Trichlorobenzene	ND	0.73	0.18	ND	0.099	0.024	
91-20-3	Naphthalene	ND	0.71	0.18	ND	0.13	0.034	
87-68-3	Hexachlorobutadiene	ND	0.72	0.15	ND	0.068	0.014	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.
J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

ATTACHMENT C

LABORATORY CASE NARRATIVE
AND CHAIN OF CUSTODY RECORD
Service Request No. P1906559

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: Unicorn Management Consultants
Project: LVRR Soil Gas / 2032-770

Service Request No: P1906559

CASE NARRATIVE

The samples were received intact under chain of custody on October 29, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The upper control criterion was exceeded for benzyl chloride in the Continuing Calibration Verification (CCV) analyzed on November 16, 2019. Since the apparent problem equates to a potential high bias and the field sample(s) analyzed in this sequence did not contain the analyte(s) in question, the data quality is not affected. No corrective action was required.

The spike recovery of methyl tert-butyl ether for the Laboratory Control Sample (LCS) analyzed on November 16, 2019 was outside the Laboratory generated control criterion. The recovery error equates to a potential high bias. However, the spike recovery of the analyte in question was within the method criteria; therefore, the data quality is not significantly affected. No corrective action was taken.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. 1706559

Company Name & Address (Reporting Information)	Unicorn Management Consultants, LLC 52 Federal Road, Suite 2C Danbury, CT 06810
Project Manager	Michael O'Connor
Phone	(203) 205-9000
Fax	(203) 205-9011
Email Address for Result Reporting	moconnor@unicornmgt.com / Farey@unicornmgt.com / mpersico@unicornmgt.com / Edickinson@ddmsinc.com
Project Name	LVRR Soil Gas
Project Number	2052-770
P.O. # / Billing Information	2052-770 Isabel Miller imiller@unicornmgt.com
Sampler (Print & Sign)	umc / umc
ALS Contact:	Kate Kanecki

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method: TO-15 Low Level w/ TICs		Comments e.g. Actual Preservative or specific instructions
G07-04	1	10/23/19	1630	AS01406	FCR00177	30	5	6L	X		
Dup102319	2	10/23/19	1632	AS00982	FCR00208	28	5	6L	X		
G07-Outdoor	3	10/23/19	1625	AS01087	FCR00490	28	1	6L	X		

3 of 160

Report Tier Levels - please select

Tier I - Results (Default if not specified) ____ Tier III (Results + QC & Calibration Summaries) ____
Tier II (Results + QC Summaries) ____ Tier IV (Data Validation Package) 10% Surcharge X

EDD required (Yes) / No
Type: EPA Region 2 Units: ____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date: 10/25/19	Time: 1800	Received by: (Signature) FedEx	Date:	Time:	
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date: 10-29-19	Time: 0918	Cooler / Blank Temperature ____ °C

Appendix D:
2020 O&M Inspection Reports

March 09, 2020

Michael Persico
Unicorn Management Consultants, LLC

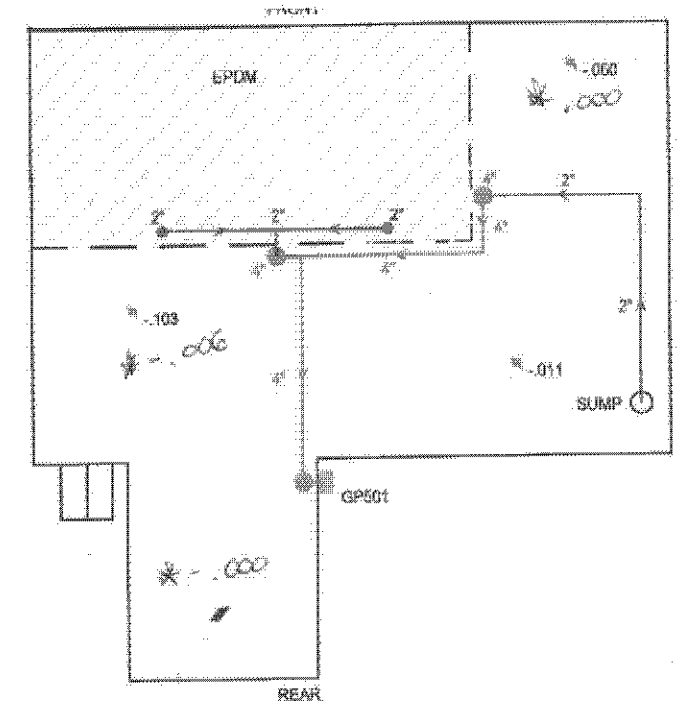
Dear Mike,

On February 18, 2020 Envirosafe Inspections performed an inspection on the previously installed vapor extraction systems at the following addressed locations in Mumford, NY 14511; [redacted] The inspection included a visual inspection of the entire system to verify the integrity of all the components on the sub slab depressurization system. In addition, sub slab air flow monitoring was conducted to compare the original sub slab air flow readings taken immediately after the system installation to existing sub slab air flow readings. Attached are copies of the original as built drawings with the original sub slab air flow readings and the existing sub slab air flow readings.

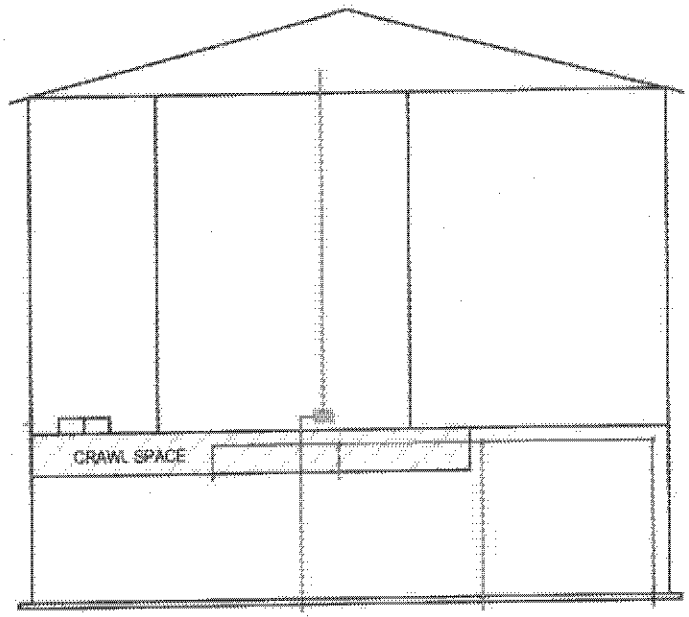
Sincerely,

Tim H. Finster
Envirosafe Inspections & Consulting
tf@envirosafeinspections.com
585-704-4385

2020 Readings



[redacted] PLAN VIEW



[redacted] ELEVATION

STATE OF NEW YORK
ROBERT W. RUGG
LICENSED PROFESSIONAL ENGINEER
NO. 081103

March, 2010

ENVIROSAFE Inspections

Envirosafe Inspections
Tel. 585.704.4385
Fax. 585.229.4250
tf@envirosafeinspections.com
www.envirosafeinspections.com

LEGEND

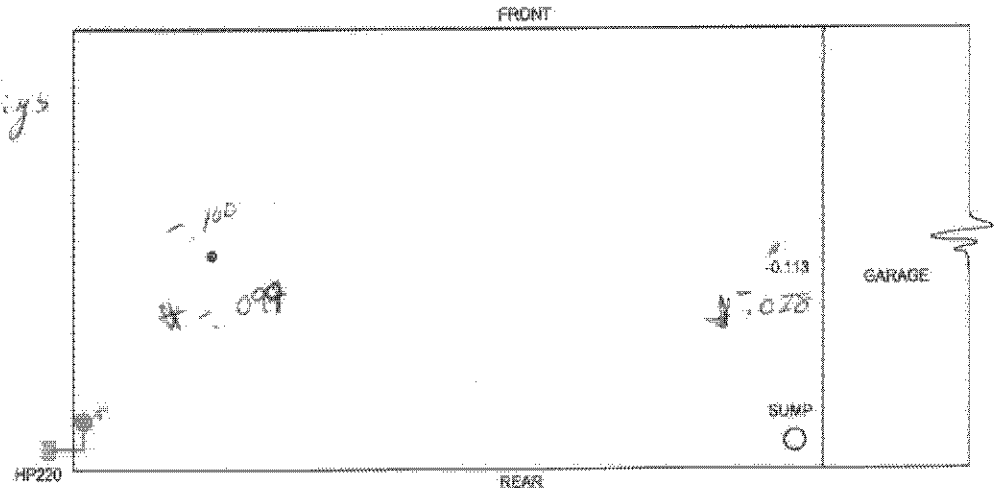
2" PVC	2"
4" PVC	4"
WALL	
EPDM MEMBRANE	
AIR CONNECTION POINT	-.145
FAN	
SUMP	

Client/Project
[redacted]

Figure No.
SK-1

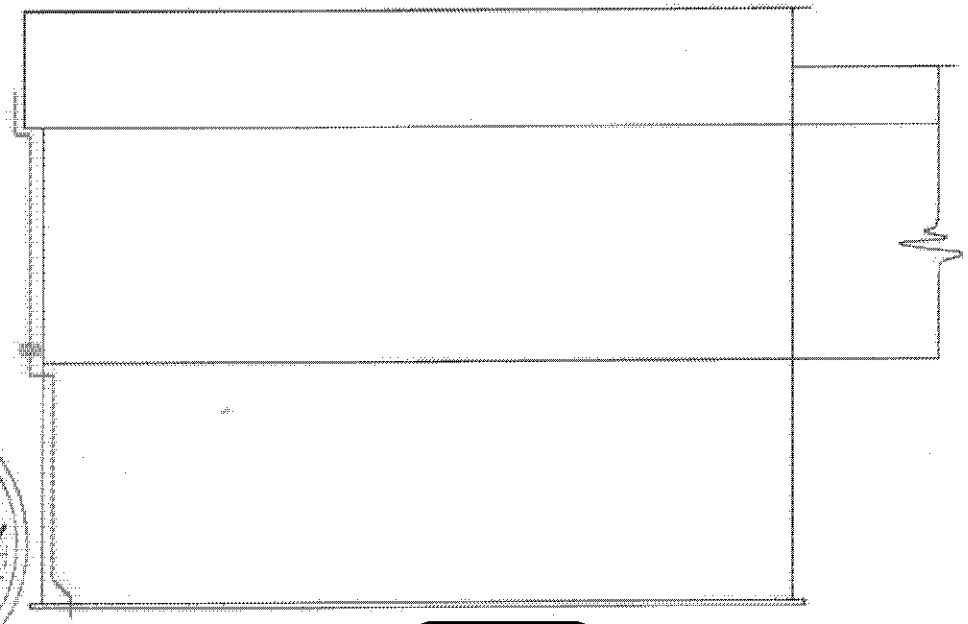
Title
Soil Vapor Extraction System
As-Built

L-28



[redacted]

PLAN



[redacted]

REAR ELEVATION

STATE OF NEW YORK
ROBERT W. RUGG
LICENSED PROFESSIONAL ENGINEER
No. 081100

March, 2010

ENVIROSAFE Inspections

Envirosafe Inspections
Tel. 585.704.4385
Fax. 585.229.4250
tf@envirosafeinspections.com
www.envirosafeinspections.com

LEGEND

4" PVC
FAN
SUMP
AIR CONNECTION POINT -0.133

Client/Project

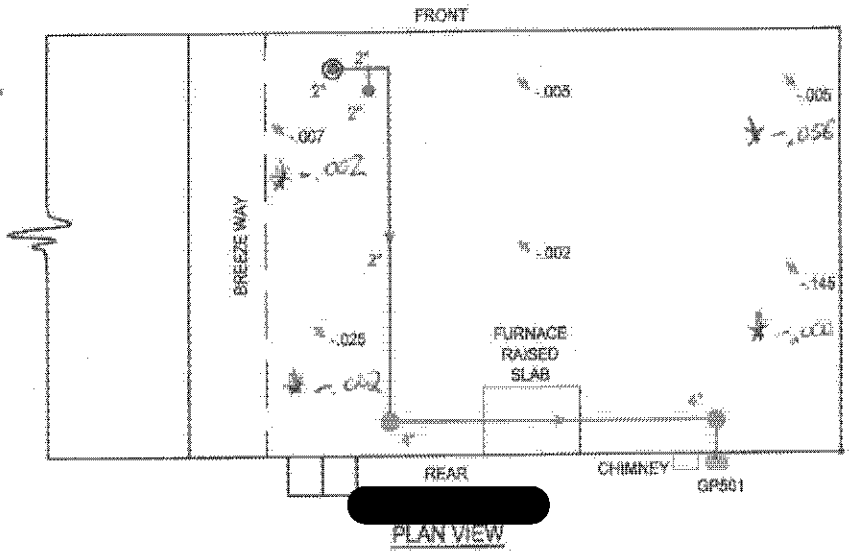
[redacted]

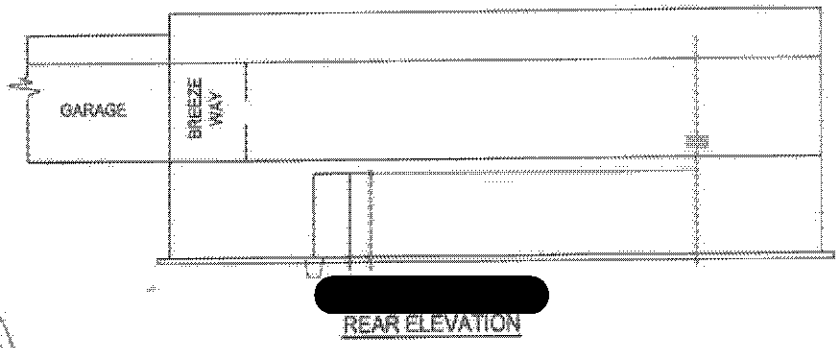
Figure No.
SK-1

Title
Soil Vapor Extraction System
As-Built-

L-32

2020 Readings





STATE OF NEW YORK
ROBERT W. RUGG
No. 081155
LICENSED PROFESSIONAL ENGINEER

March, 2010

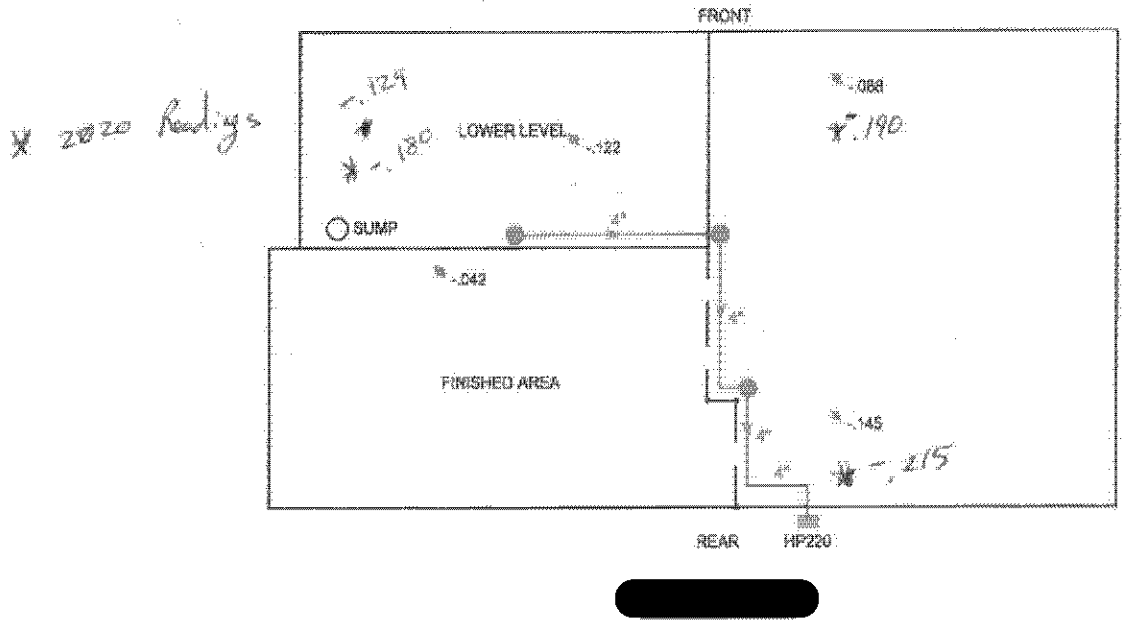
ENVIROSAFE Inspections

Envirosafe Inspections
Tel. 585.704.4385
Fax. 585.229.4250
tf@envirosafeinspections.com
www.envirosafeinspections.com

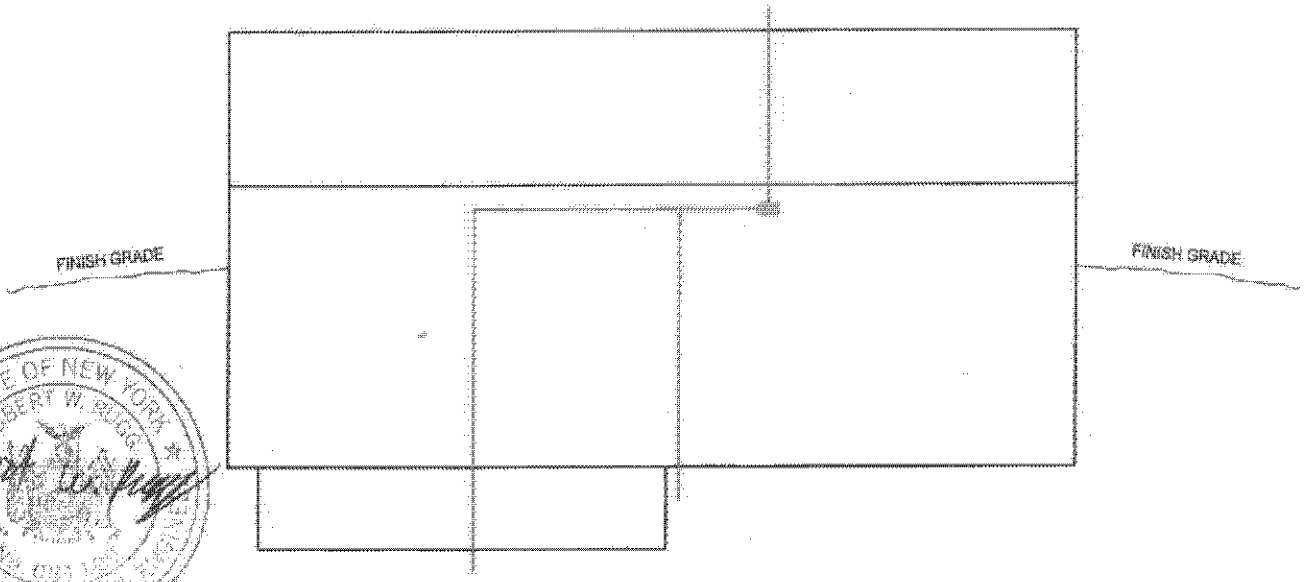
LEGEND
2" PVC
4" PVC
WALL
AIR CONNECTION POINT
FAN
SUMP

Client/Project
[redacted]
Figure No.
SK-1
Title
Soil Vapor Extraction System
As-Built

M-23



[redacted]



March, 2010

Envirosafe Inspections
Tel. 585.704.4385
Fax. 585.229.4250
tf@envirosafeinspections.com
www.envirosafeinspections.com

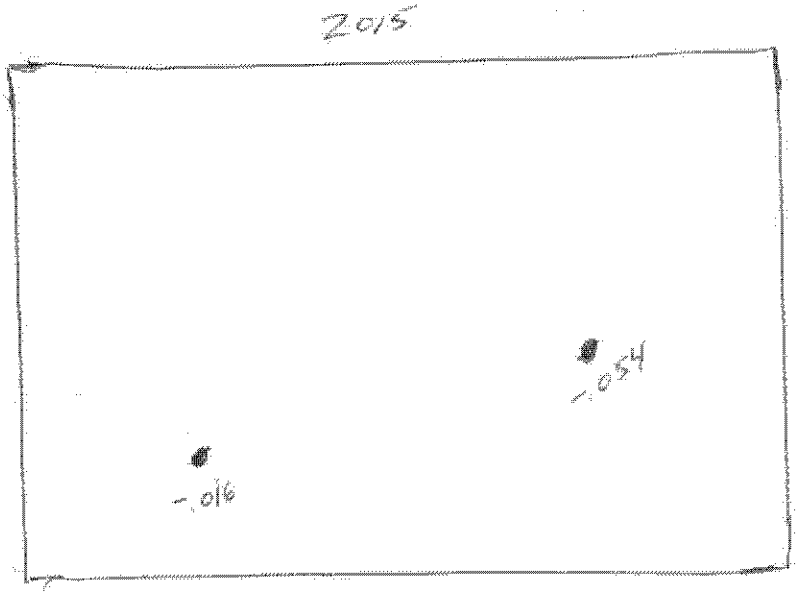
LEGEND

2" PVC	2"
4" PVC	4"
WALL	
AIR CONNECTION POINT	-.145
FAN	
SUMP	

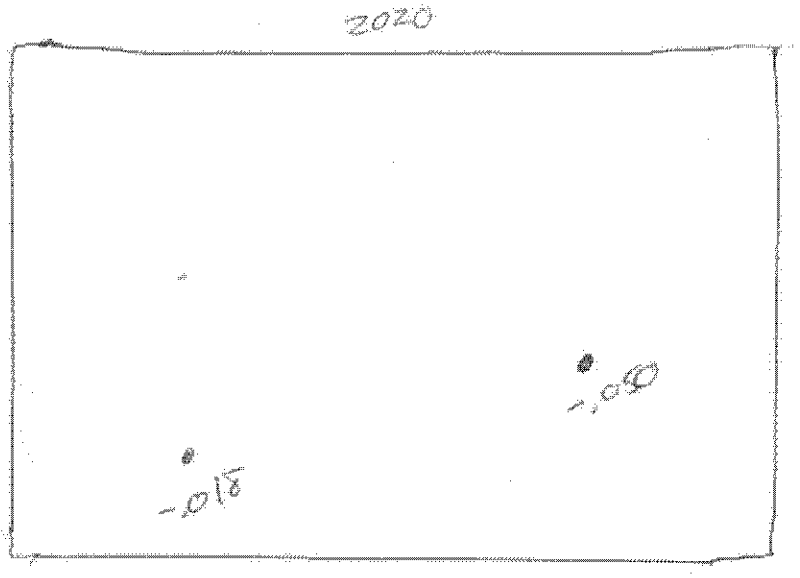
Client/Project
[redacted]

Figure No.
SK-1

Title
Soil Vapor Extraction System
As-Built



[redacted]



Environmental Inspections
[redacted] of SSDS
Passive Readings

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location G01]

Dear Mr. Perisco,

On February 18, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted] [Location G09]

Dear Mr. Perisco,

On February 18, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted] [Location G10]

Dear Mr. Perisco,

On February 19, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location L17]

Dear Mr. Perisco,

On February 18, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location L26]

Dear Mr. Perisco,

On February 19, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.); **Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **Water in pipe noise reported – see item #7**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. Repairs and adjustments: **Adjusted pipe slope to improve condensation drainage**

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location L38]

Dear Mr. Perisco,

On February 18, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

R E P O R T

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location M26]

Dear Mr. Perisco,

On February 19, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

mitigation tech *vapor intrusion specialists*

REPORT

March 8, 2020

Mr. Michael Persico
Unicorn Management Consultants, LLC
52 Federal Rd, Suite 3c
Danbury, CT 06810
Via email: mpersico@unicornmgt.com

Re: Inspection of Soil Vapor Intrusion Mitigation System
[redacted][Location M35]

Dear Mr. Perisco,

On February 19, 2020 we visited this location with representatives from your office. We performed the following procedures and recorded the following observations:

.

1. Conduct a visual inspection of the complete SSD system (e.g., vent fan, piping, warning device, labeling on systems, etc.);**Observation : Acceptable**
2. Inspect all components for condition and proper operation; **Observation : Acceptable;** see also #3 below
3. Identify (and repair) any leaks in accordance with Sections 4.3.1(a) of the Guidance **Observation:** No leaks in piping system
4. Inspect the discharge point to verify that no air intakes have been located nearby; **Observation: No new intakes**
5. Interview the primary occupant of the premises seeking comments regarding the operation of the SSD system; **No comments of concern,**
6. Conduct pressure field extension testing (to ensure that the system is maintaining a vacuum beneath the entire slab).**Observation:** sub-slab vacuum at established test point
7. No repairs or adjustments made

I certify that the installed system is operational and without degradation in effectiveness compared to original installation condition.

Thank you

Nicholas E. Mouganis EPA listing # 15415-I; NEHA ID# 100722 ***mitigationtech.com

Appendix E:
Excerpt from the *Draft Feasibility Study Report*, dated June 5, 2019

in order to identify long-term data trends, seasonal data fluctuations, or if additional corrective actions may be warranted.

c. Sampling of sediments at locations which have historically demonstrated the presence of TCE will also be undertaken as part of the proposed long-term monitoring program. Figure 13 indicates the sediment sampling locations from a December 2009/January 2010 sampling event conducted by UMC. Based on the results of this sampling event, TCE was detected at 10 locations in the vicinity of the Mud Creek Gorge and Spring Creek. The specific locations where TCE was detected (and as indicated on Figure 13) include:

   i. Mud Creek Gorge Area (2 locations): LVRRSD-03 and LVRRSD-56;

   ii. Spring Creek Area (8 locations): LVRRSD-12, LVRRSD-14, LVRRSD-17, LVRRSD-18, LVRRSD-19, LVRRSD-20, LVRRSD-23 and LVRRSD-45.

   Based on the sampling results, only one sediment sample exceeded the proposed RAO of 46 ppb for sediment (sample LVRRSD-03, which had a TCE concentration of 48 ppb). Sediment samples would be collected on an annual basis for the first five years. After the initial 5-year review period, a revised sampling schedule may be proposed. Sampling data will be tracked in order to identify long-term data trends, or if additional corrective actions may be warranted.

d. Indoor Air quality would be monitored at the twelve (12) locations where Sub-Slab Depressurization (SSD) systems were previously installed, as detailed in the "Revised Draft Indoor Air Monitoring Report", prepared by UMC in July 2013 (Reference 8). These locations include the properties identified below, which are also shown on Figures 10a, 10b, 10c, and 10d:

   i. Genesee County (3 locations): G-01, G-09, G-10

   ii. Monroe County (3 locations): M-23, M-26, M-35

   iii. Livingston County (6 locations): L-17, L-26, L-27, L-32, L-33, L-38

   Indoor air samples would be collected from these locations twice over the course of the first 5-year period, and the SSD systems would be inspected annually. Appropriate maintenance actions shall be undertaken as necessary following these annual inspections. After the initial 5-year period, a revised sampling and inspection frequency may be proposed.

   Based on the recommendations presented in the "Vapor Intrusion Evaluation" report prepared by AECOM in July 2017 (Reference 60), 12 additional properties identified as having potentially complete vapor intrusion pathways would be further investigated in order to determine if vapor mitigation activities are necessary.

Should this alternative be selected, a detailed monitoring plan and O&M schedule will be established in co-ordination with USEPA for groundwater, surface water, sediment and indoor air.

Limited Excavation and Capping:

An additional component to this proposed alternative includes soil excavation and capping activities in Zone 1, as detailed in the FAA report prepared by Benchmark Environmental Engineering Science, PLLC in March 2018 (Reference 5). Soils in Zone 1 would be excavated to the extent where the ISCOs identified in Title 6, Subpart 375-6 of the New York State Codes, Rules and Regulations (6NYCRR Subpart 375-6) would be met for TCE (References 66 and 67). As part of this approach, the NYSDEC CSCOs were also considered. Therefore, the proposed remedial measures described below would allow for potential commercial usage of