



VIA ELECTRONIC MAIL

April 30, 2019

Mr. Daniel R. Lanners, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway
Albany, NY 12233-7014

**Subject: Indoor Air Sampling Report for Former Manufacturing Building
Federal-Mogul/Huck Site, Kingston, New York
NYSDEC Site Number V00171**

Dear Mr. Lanners:

WSP USA Inc., on behalf of Tenneco Inc. (as successor in interest to Federal-Mogul LLC), has prepared this report to summarize the results of air samples collected on March 19 and April 2, 2019, at the former Huck manufacturing facility at 85 Grand Street in Kingston, New York. The indoor air sampling events were conducted in accordance with WSP's Indoor Air Sampling Work Plan, dated February 5, 2019, and the New York State Department of Environmental Conservation's (NYSDEC's) conditional approval letter, dated March 4, 2019. The work plan was submitted in response to the NYSDEC's email request for indoor air sampling, dated January 25, 2019. The second indoor air sampling event was proposed by Tenneco in an email to Dan Lanners of the NYSDEC, dated March 27, 2019, and approved by Kristen Kulow of the New York State Department of Health (NYSDOH) by email on March 27, 2019.

BACKGROUND INFORMATION

The site consists of a former manufacturing building and an attached office building, which together occupy approximately 105,000 square feet. The remainder of the property consists mainly of asphalt parking lots and access roads (Figure 1A). The former manufacturing building contains approximately 400 self-storage units and a small office area referred to as the main office complex. The self-storage units have a ceiling constructed of wire mesh and, thus, VOCs emitted by materials that may be stored in these units would be released to indoor air within the former manufacturing building. The attached office building is used by a moving and truck rental company. Portions of the former manufacturing building are leased to other entities.

Tenneco previously performed indoor air sampling at the site on eight occasions from April 2003 to August 2008 (Figures 1A and 1B). The initial round of indoor air samples was collected from the main office complex and the former Scheffel Furniture space in April 2003 to evaluate indoor air quality in portions of the building that were occupied on a routine basis (Figure 1A). Based on the results of the April 2003 sampling event, an expanded sampling event was performed in August 2003 that included 12 locations in the former manufacturing building (Figure 1A).

In March 2004, two interim remedial measures (IRMs) were installed at the site (the former Scheffel Furniture space now contains the treatment equipment). A soil vapor extraction (SVE) trench system was installed primarily along the eastern and southern property

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lines to address volatile organic compounds (VOCs) in shallow soil, prevent the offsite migration of VOCs in soil vapor, and address VOCs in soil gas in the vicinity of the former metal finish and chemical storage area and main office complex (Figure 2). In addition, a subslab depressurization system was installed in the attached office building in the southeastern portion of the site (Figure 2). Following startup of the subslab depressurization system, indoor air samples were collected from the basement and first floor of the attached office building in April 2004 and January 2005. The results from the January 2005 sampling event indicated non-detectable levels of trichloroethene (TCE) on the first floor and less than 1 microgram per cubic meter ($\mu\text{g}/\text{m}^3$) of TCE in the basement (Figure 1A). Following startup of the SVE system, indoor air samples were collected in the former manufacturing building in April 2004, July 2004, and January 2005 to evaluate the performance of the SVE system (Figure 1A). The performance monitoring samples were collected at five locations that exhibited the highest TCE concentrations during the August 2003 sampling event, while also targeting occupied spaces near, and downgradient from, the groundwater source areas in the former finish and chemical storage area and former degreaser area. Additional indoor air samples were collected in the main office complex in June, July, and August 2008 to verify that pulsed operation of the SVE system would not negatively affect indoor air quality within the building. The results from the June, July, and August 2008 samples collected in the main office complex indicated the presence of TCE at concentrations of 4, 3.4 and 1.79 parts per billion by volume, respectively (Figure 1B). These concentrations are equivalent to 22, 18, and 9.6 $\mu\text{g}/\text{m}^3$ (Figure 1B).

In 2014, WSP installed an air sparging (AS)/SVE system as an IRM to reduce VOC mass in groundwater and vadose zone soils in select areas of the site. The AS/SVE system consists of 12 SVE wells and 9 AS wells divided into two cycle groups to provide for cycled operation of the system (Figure 2). Currently, the cycle groups are alternated on an approximately monthly basis. Cycle Group 1 includes SVE and AS wells inside the building in the two groundwater source areas. Cycle Group 2 is comprised of AS and SVE wells located west and southwest of the building. In accordance with the approved work plan, the March 19, 2019, indoor air sampling event was performed while the AS/SVE wells located within the building (i.e., Cycle Group 1) were inactive as a conservative measure. On March 22, 2019, the Cycle Group 1 wells were re-activated as part of the normal AS/SVE system operating schedule. The April 2, 2019, indoor air samples were collected with the Cycle Group 1 wells operating to evaluate the effect of system operation on indoor air quality.

The indoor air samples discussed in this report were collected from the former Family Services space, the Klomm Construction space, the main office complex, and in the self-storage portion of the main building (Figure 3). The former Family Services space is vacant and is used by Allways Moving to store moving carts. The Klomm Construction space is used primarily for the storage of construction supplies, including paints, roofing materials, motor and transmission oils, grease, gas-powered equipment, and coatings and sealants, and appears to be occupied only at the beginning and end of each work day to load and unload materials. The main office complex is a free-standing enclosure and consists of an office area, break room, bathroom, and storage area. The storage area contains paints, stains, primers, caulks, and materials used to maintain the building. The office area is generally occupied by an attendant during normal working hours, including weekends. Based on WSP's observations, tenants access the self-storage portion of the building on an infrequent basis.

SCOPE OF WORK

Each indoor air sampling event consisted of performing a building inspection and material inventory, collecting six indoor air samples within the former manufacturing building, and collecting two ambient outdoor air samples at upwind locations selected on the day of sampling to evaluate potential background sources for VOCs in outdoor air. The sampling activities were conducted in accordance with the approved work plan and the NYSDOH's Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October 2006, and associated updates. A description of the sampling activities is provided below.

BUILDING INSPECTION AND MATERIAL INVENTORY

WSP performed pre-sampling site inspections and completed material inventories on March 15, 2019, before the sampling activities on March 19, 2019, and on March 29, 2019, before the sampling activities on April 2, 2019. During the initial site inspection, WSP completed a NYSDOH indoor air quality questionnaire and building inventory form for the Klomm Construction space, former Family Services space, main office complex, and the self-storage area of the main building. During the March 29 inspection, a second



material inventory was completed for each space. In general, the volatile ingredients of each material, if available, were photographed or recorded on the inventory form, and the containers were scanned with a photoionization detector (PID; RAE Systems ppbRAE) for potential vapor emissions¹. The material inventories identified only one commercial product labeled as containing a site-related VOC. A product was identified in the Klomm Construction space that contained tetrachloroethene (PCE); this container was sealed in a zipper-style plastic bag during the sampling activities. During the building inspection, WSP observed cracks and other openings in the concrete slab in the hallways of the self-storage portion of the building. In addition, WSP's inspection of the main office complex indicated the presence of cracks in the concrete floor and a covered below-grade sump in the bathroom area associated with sanitary wastewater collection. The potential also exists that open floor drains and sumps associated with former manufacturing operations may be present in the self-storage units.

The target site-related VOCs (i.e., TCE, PCE, and cis-1,2-dichloroethene [cis-1,2-DCE]) are found in many household and commercial products. While WSP attempted to limit the potential for these background sources to affect the indoor air results by performing material inventories in the areas sampled and eliminating potential sources for these VOCs, the interior of the former manufacturing building contains over 400 self-storage units (with wire mesh ceilings) that were not accessible to WSP. Therefore, WSP could not control or eliminate any potential impacts to indoor quality resulting from VOC-containing materials that may be stored in these units.

INDOOR AIR SAMPLING PROCEDURES

On March 19 and April 2, 2019, indoor air samples were collected from the same six indoor air locations (IA-1 through IA-6) using evacuated 6-liter SUMMATM-style canisters with flow controllers and particulate filters installed (Figure 3). Each of the indoor air sample canisters were placed approximately 3 to 5 feet above the floor to be representative of the breathing zone. Physical and visual barriers were placed around the canisters, if necessary, so that they are not disturbed during sample collection. The flow regulators were pre-set by the laboratory to collect the samples over an approximately 8-hour period. The flow regulator was connected to the canister and opened to initiate sample collection. After approximately 8 hours, the flow regulator was closed to complete the sample collection. The sample name, location, time and date of sample collection, final canister vacuum, canister and regulator number, and the analytical method to be used were recorded on the chain-of-custody form and in the field log book. Site conditions were documented during indoor air sampling activities.

AMBIENT OUTDOOR AIR SAMPLING PROCEDURES

For each sampling event, ambient (outdoor) air samples were collected from two locations (AA-1 and AA-2) upwind of the facility concurrently with indoor air sample collection. The March 19, 2019, outdoor air samples were collected northwest of the former manufacturing building, and on April 2, 2019, outdoor air samples were collected southeast of the building (Figure 3). The outdoor air samples were collected with evacuated 6-liter SUMMATM-style canisters and dedicated flow controllers over an approximately 8-hour period using the same procedures described above for the indoor air samples. Site conditions, including temperature, wind direction and velocity, barometric pressure, and the occurrence of precipitation were documented before initiating the sampling activities.

SAMPLE ANALYSIS AND QUALITY ASSURANCE/QUALITY CONTROL

Quality assurance/quality control procedures were followed to ensure that controls were initiated and maintained throughout sampling and analysis. The canisters were submitted under ambient conditions to an offsite laboratory, ALS Environmental of Simi Valley, California, under strict chain-of-custody procedures. ALS Environmental (laboratory ID 11221) is certified under the NYSDOH Environmental Laboratory Approval Program. As specified in the work plan, the indoor air samples were analyzed for site-related VOCs (i.e., TCE, PCE, and cis-1,2-DCE) using USEPA Method TO-15. The sample results were validated by a third-party contractor (Laboratory Data Consultants, Inc., in Carlsbad, California).

¹ In some cases, PID measurements were not recorded for each material due to elevated background VOC concentrations within the space.



The canisters used for the sampling activities were 100-percent individually certified-clean by the laboratory by analyzing the ambient air inside a clean canister by USEPA Method TO-15. If no target compounds were detected at concentrations above the reporting limits, then the canister was evacuated again, and the canister was available for sampling. If target compounds were detected at concentrations above the reporting limits, then the canister was re-cleaned and reanalyzed for the target compounds.

A duplicate indoor air sample was collected from sample location IA-2 during both sampling events. The duplicate sample was collected at the same time and from the same sample location using a T-splitter. The field duplicate identity was not provided to the laboratory. The field duplicates are useful in documenting the precision of the sampling process. In addition, a laboratory-prepared trip blank accompanied the sample canisters from the laboratory to the field and from the field to the laboratory. The trip blank was used to evaluate the potential for contamination during shipment.

SAMPLING RESULTS

The site-related VOCs detected in indoor and outdoor air samples for both sampling events are provided in Table 1 and Figure 3, and the analytical data and data validation report are in Enclosure A.

The March and April 2019 indoor air results from the former Family Services space (IA-6) indicated the presence of TCE at concentrations of 2.2 and 1.6 µg/m³ (a reduction of up to 127 µg/m³ as compared to the pre-remediation² concentration) and PCE at concentrations of 0.59 and 0.23 µg/m³. cis-1,2-DCE was detected only during the April sampling event at an estimated concentration of 0.029 µg/m³. The indoor air results from the Klomm Construction space (IA-4) indicated the presence of TCE at concentrations of 0.81 and 0.29 µg/m³ (a reduction of up to 102 µg/m³ as compared to the pre-remediation concentration) and PCE at concentrations of 0.81 and 0.30 µg/m³. cis-1,2-DCE was detected in the Klomm Construction space only during the April sampling event at an estimated concentration of 0.016 µg/m³. The March and April 2019 sample results from the main office complex indicated the presence of TCE at concentrations of 4.8 and 5.5 µg/m³ (a reduction of up to 70 µg/m³ as compared to the pre-remediation concentration), PCE at concentrations of 0.79 and 0.98 µg/m³, and cis-1,2-DCE at concentrations of 0.13 (estimated) and 0.20 µg/m³. Three indoor air samples (IA-1, IA-3, and IA-5) were collected from the self-storage portion of the main building. The indoor air results from these locations indicated the presence of TCE at concentrations from 4.3 to 6.8 µg/m³ (a reduction of up to 254 µg/m³ as compared to pre-remediation concentrations at these locations), PCE at concentrations from 0.73 to 1.4 µg/m³, and cis-1,2-DCE at concentrations from 0.14 (estimated) to 0.35 µg/m³.

The March 2019 outdoor air samples contained only PCE at estimated concentrations of 0.11 µg/m³. The April 2019 outdoor air samples contained estimated concentrations of TCE (0.20 µg/m³) and PCE (0.078 and 0.070 µg/m³). cis-1,2-DCE was not detected in the April outdoor air samples.

Operation of the IRMs has substantially improved indoor air quality within the main office complex and throughout the former manufacturing building. For example, a comparison of the TCE concentrations detected in the main office complex in March and April 2019, as compared to the pre-remediation concentration detected in August 2003, indicates a 94 percent reduction. The observed reduction in TCE concentrations at other sample locations within the building, as compared to pre-remediation concentrations, are 98 percent in the former finish and chemical storage area (IA-1), 96 percent in the former heat treat area (IA-3), 96 percent in the central portion of the building (IA-5), and 99 percent in the former Family Services space (IA-6).

CONCLUSIONS AND RECOMMENDATIONS

The results of the March and April 2019 indoor air sampling events indicate that the operation of the IRMs has significantly reduced the concentration of TCE in indoor air throughout the main building. However, the potential ongoing impact on indoor air quality from materials in the self-storage units could not be evaluated. As noted above, the self-storage units have a wire mesh ceiling and VOCs emitted from materials within the storage units would be released to indoor air within the former manufacturing building. Furthermore, cracks and other openings in the concrete slab were observed during the building inspection, including in the main office complex; these openings could provide pathways for VOCs in soil vapor to enter the former manufacturing building. The indoor air

² The term pre-remediation refers to indoor air data collected before the SVE trench system IRM began operating in March 2004.



results from the March and April 2019 sampling events indicate similar concentrations, which confirms that the pulse schedule for the SVE system and alternating of AS/SVE cycle groups on a monthly basis does not have a significant effect on indoor air quality within the building.

Tenneco anticipates that continued operation of the IRMs under the approved Site Management Plan will further improve indoor air quality. However, Tenneco proposes to implement the following actions in the short term to improve indoor air quality in the office complex and throughout the building:

- Seal openings and cracks in the concrete floor in accessible portions of the main building, including the main office complex, hallways within the self-storage area, and in storage units that are not currently rented. In addition, any remaining floor drains or sumps within accessible areas of the building will be sealed.
- Retain a heating, ventilation, and air conditioning subcontractor to evaluate the existing air handling system for the main office complex to determine if adjustments can be made to increase the influx of outdoor air and, if possible, maintain positive pressure within the office area.
- Evaluate the operation of the IRMs to determine if adjustments can be made to enhance the performance of the systems in a manner that will benefit indoor air quality in the office area and throughout the main building.

If you have any questions or comments regarding this report, please feel free to contact Mark Bauer of Tenneco at (248) 354-8912, or me at (315) 655-3900.

Sincerely,

A handwritten signature in black ink that reads 'Brian E. Silfer'.

Brian Silfer, P.G.
Practice Leader

BES:rla
k:\federal-mogul\kingston\correspondence\via sampling work plan for huck building\report

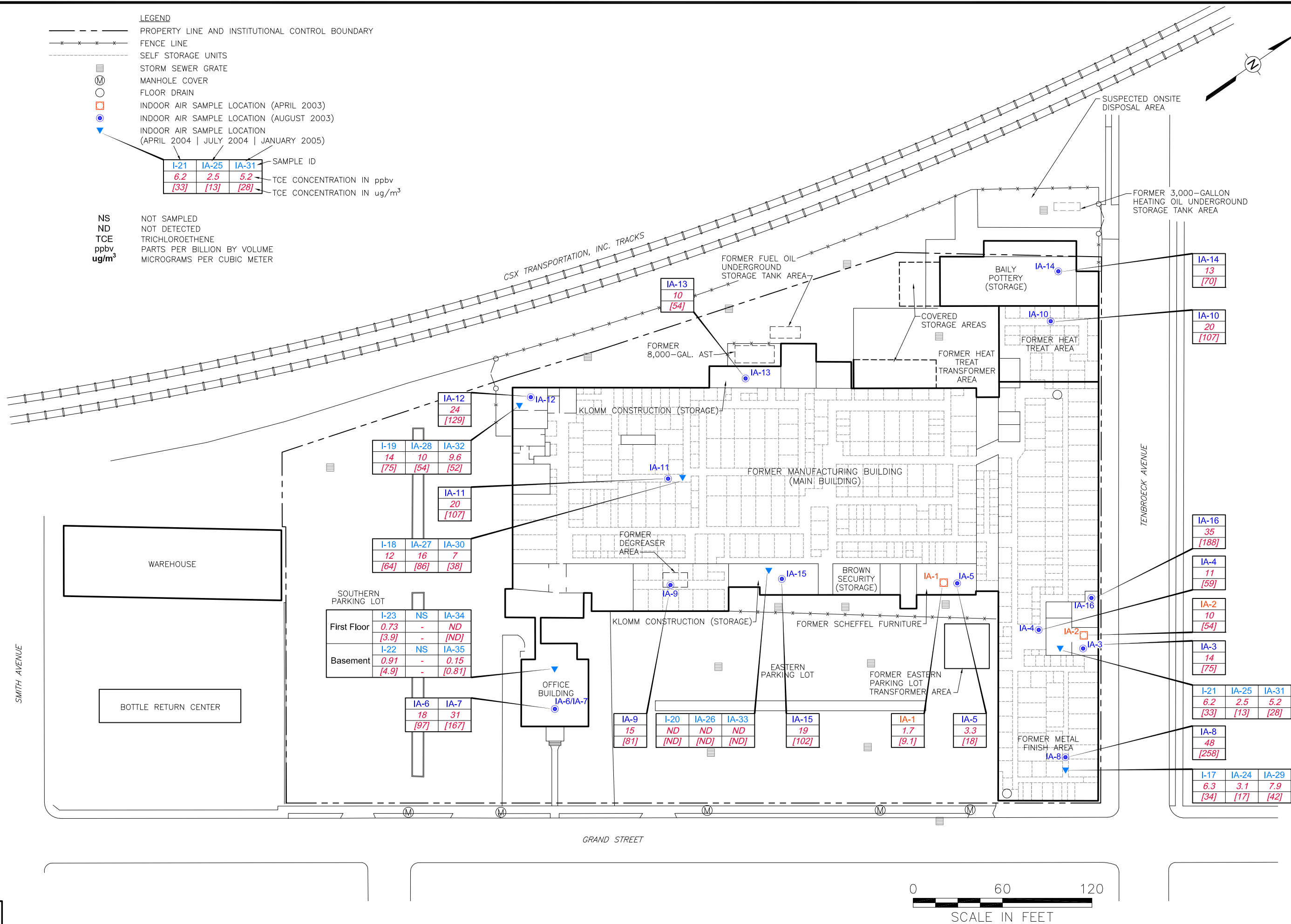
cc: Kristin Kulow, New York State Department of Health
Mark T. Bauer, Federal-Mogul Powertrain LLC

Enclosures

FIGURES

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B



FORMER HUCK MANUFACTURING FACILITY
KINGSTON, NEW YORK
PREPARED FOR
FEDERAL-MOGUL LLC

Figure 1A
HISTORICAL INDOOR AIR RESULTS
(2003 THROUGH 2005)

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TEL: +1 315.655.5900



Drawn By: EGC

Checked:

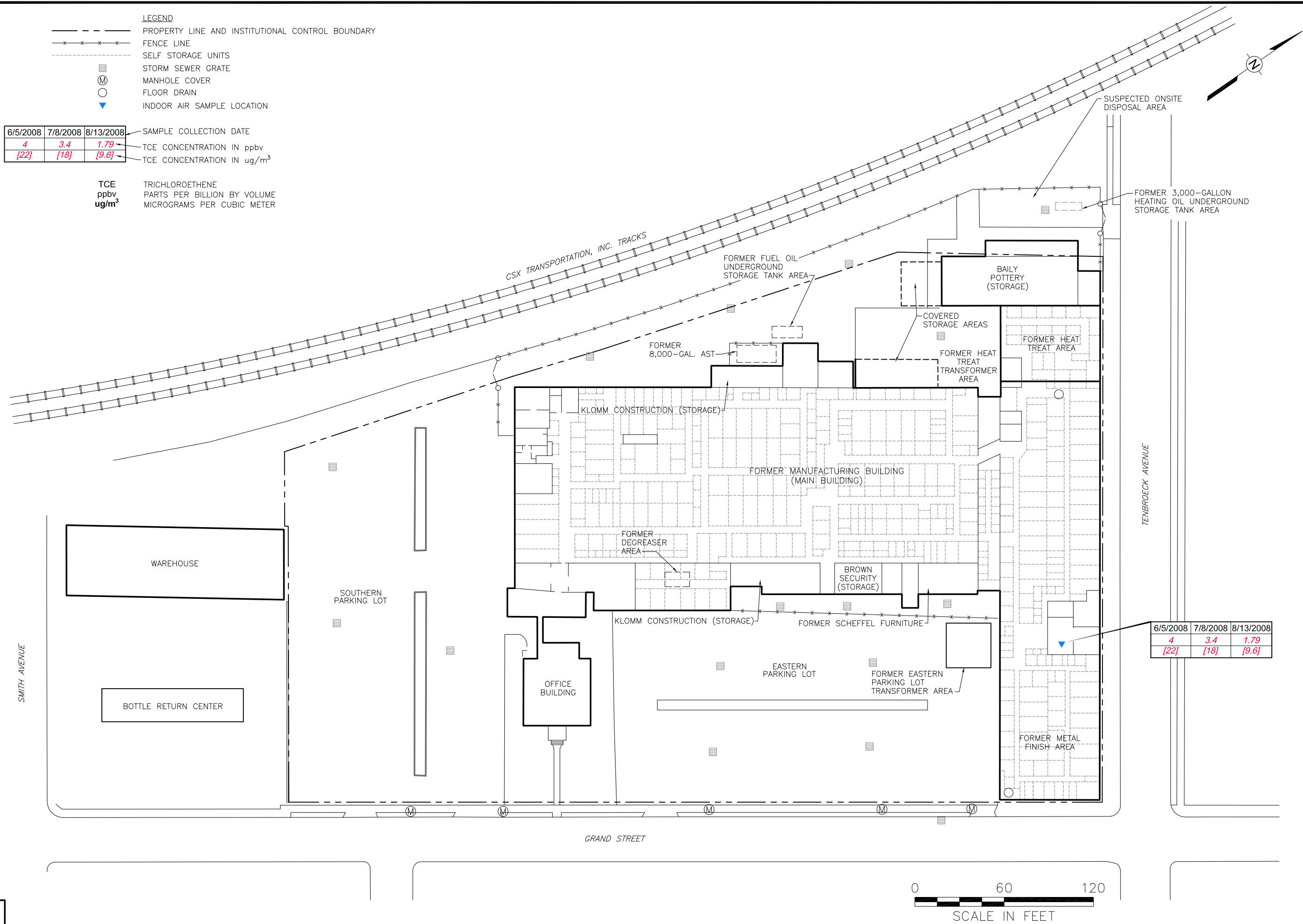
Approved: AMR 4/26/2019

DWG Name: 314V1678.006-007



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B



Drawn By: EGC

Checked:

Approved: AMR 4/26/2019

DWG Name: 314V1678.006-008

FORMER HUCK MANUFACTURING FACILITY

KINGSTON, NEW YORK

PREPARED FOR
FEDERAL-MOGUL LLC

Figure 1B

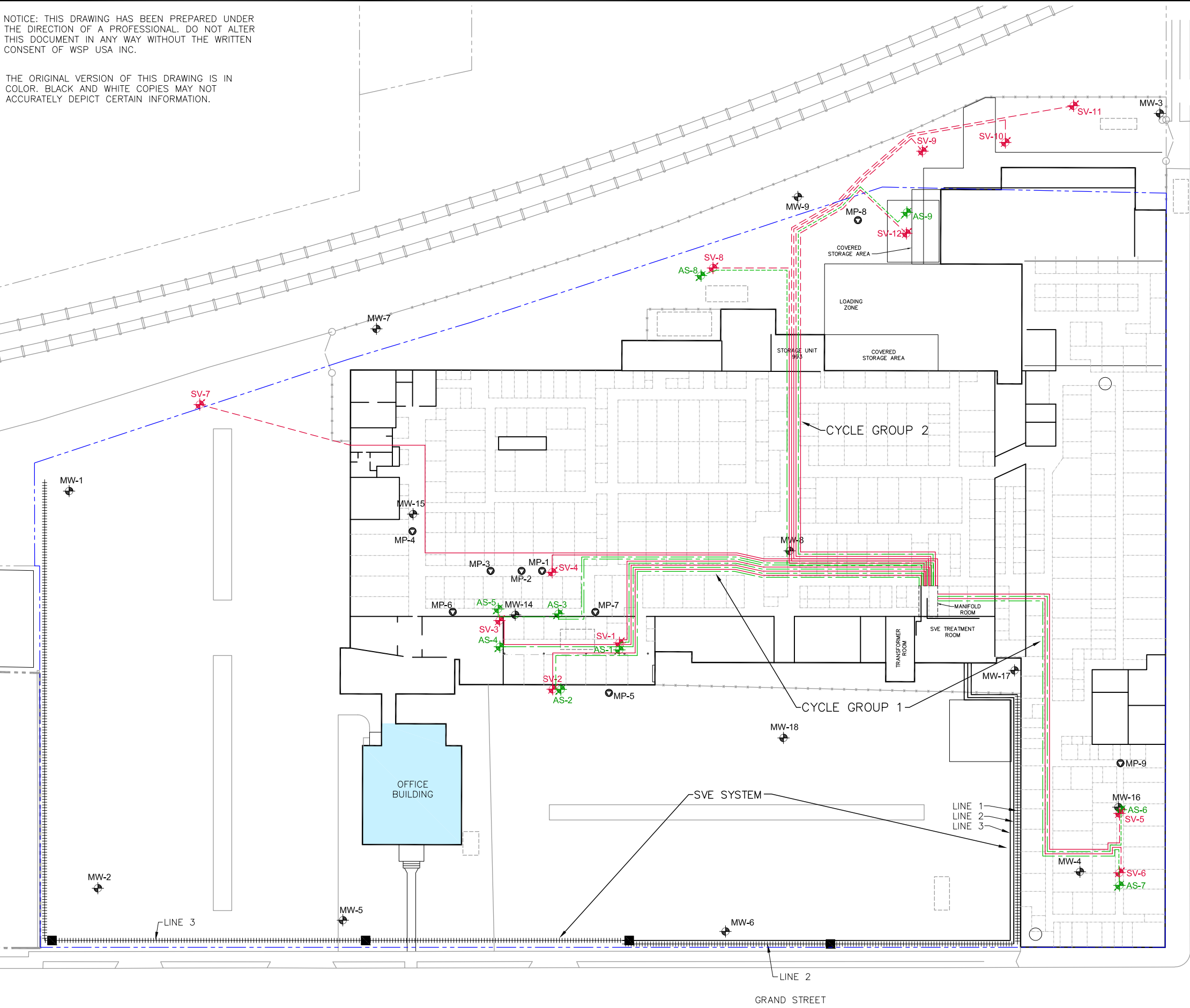
HISTORICAL INDOOR AIR RESULTS
(2008)



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NOTICE: THIS DRAWING HAS BEEN PREPARED UNDER THE DIRECTION OF A PROFESSIONAL. DO NOT ALTER THIS DOCUMENT IN ANY WAY WITHOUT THE WRITTEN CONSENT OF WSP USA INC.

THE ORIGINAL VERSION OF THIS DRAWING IS IN COLOR. BLACK AND WHITE COPIES MAY NOT ACCURATELY DEPICT CERTAIN INFORMATION.



LEGEND

--- PROPERTY BOUNDARY/SITE BOUNDARY
--- MONITORING WELL

SUBSLAB DEPRESSURIZATION SYSTEM

AS/SVE SYSTEM COMPONENTS:

MP-1 VACUUM MONITORING LOCATION
AS-1 AIR SPARGING WELL
SV-1 SVE WELL

1.5"Ø AS PIPING (HUNG IN BUILDING INTERIOR)
4"Ø SVE PIPING (HUNG IN BUILDING INTERIOR)
1.5"Ø AS PIPING (BURIED)
4"Ø SVE PIPING (BURIED)

SVE SYSTEM COMPONENTS:

6"Ø EXTRACTION SCREEN
6"Ø EXTRACTION CONVEYANCE PIPING
VALVE BOX

- NOTES:**
1. SELF STORAGE UNIT LOCATIONS ARE APPROXIMATE.
 2. SVE SYSTEM INSTALLED IN FEBRUARY 2004.
 3. SUBSLAB DEPRESSURIZATION SYSTEM INSTALLED IN MARCH 2004.
 4. AS/SVE SYSTEM INSTALLED IN APRIL 2014.

TENBROOK AVENUE

GRAND STREET

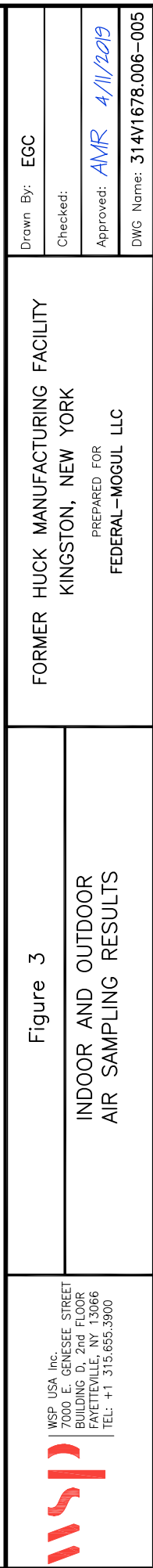
0 50 100
SCALE IN FEET

Figure 2
INTERIM REMEDIAL MEASURES

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B

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FORMER HUCK MANUFACTURING FACILITY KINGSTON, NEW YORK PREPARED FOR FEDERAL-MOGUL LLC			
Figure 2 INTERIM REMEDIAL MEASURES			
WSP USA Inc. 5 SULLIVAN STREET CAZENOVIA, NY 13035 TEL: +1 315.655.3900			



TABLE

Table 1

**Indoor and Outdoor Air Sampling Results
Former Huck Manufacturing Building
Kingston, NY (a)**

Location (b)	Sample ID	Sample Date	Compounds ($\mu\text{g}/\text{m}^3$)		
			cis-1,2-Dichloroethene	Trichloroethene	Tetrachloroethene
IA- 1	HUCKIAF031919-1	3/19/2019	0.14 J	5.2	0.77
	HUCKIAF040219-1	4/2/2019	0.23	6.2	1.1
IA-2	HUCKIAF031919-2	3/19/2019	0.13 J	4.8	0.79
	HUCKIAFR031919-2 (c)	3/19/2019	0.12 J	4.8	0.79
	HUCKIAF040219-2	4/2/2019	0.20	5.5	0.98
	HUCKIAFR040219-2 (d)	4/2/2019	0.20	5.4	0.97
IA- 3	HUCKIAF031919-3	3/19/2019	0.14 J	4.3	0.92
	HUCKIAF040219-3	4/2/2019	0.35	6.8	1.4
IA- 4	HUCKIAF031919-4	3/19/2019	0.11 U	0.81	0.81
	HUCKIAF040219-4	4/2/2019	0.016 J	0.29	0.30
IA- 5	HUCKIAF031919-5	3/19/2019	0.16	4.5	1.2
	HUCKIAF040219-5	4/2/2019	0.25	4.6	0.73
IA - 6	HUCKIAF031919-6	3/19/2019	0.11 U	2.2	0.59
	HUCKIAF040219-6	4/2/2019	0.029 J	1.6	0.23
AA-1	HUCKAA031919-1	3/19/2019	0.10 U	0.099 U	0.11 J
	HUCKAA040219-1	4/2/2019	0.014 U	0.16 U	0.078 J
AA-2	HUCKAA031919-2	3/19/2019	0.11 U	0.10 U	0.11 J
	HUCKAA040219-2	4/2/2019	0.014 U	0.020 J	0.070 J

a/ 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 method reporting limit but greater than or equal to the method detection limit.

b/ Location: IA = indoor air; AA = outdoor air.

c/ Duplicate sample of HUCKIAF031919-2.

d/ Duplicate sample of HUCKIAF040219-2.

ENCLOSURE A – ANALYTICAL RESULTS AND DATA VALIDATION REPORTS



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LABORATORY REPORT

April 2, 2019

Brian Silber
WSP Group
5 Sullivan Street
Cazenovia, NY 13035

RE: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Dear Brian:

Enclosed are the results of the samples submitted to our laboratory on March 22, 2019. For your reference, these analyses have been assigned our service request number P1901513.

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



By Sue Anderson at 2:16 pm, Apr 02, 2019

Sue Anderson
Project Manager



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Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: WSP Group
Project: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00
Service Request No: P1901513
New York Lab ID: 11221

CASE NARRATIVE

The samples were received intact under chain of custody on March 22, 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 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.



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 Simi Valley, CA 93065
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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	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
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: WSP Group
 Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Service Request: P1901513

Date Received: 3/22/2019

Time Received: 09:30

TO-15 - VOC Cans

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
HUCKIAF031919-1	P1901513-001	Air	3/19/2019	17:01	SSC00338	-2.20	3.65	X
HUCKIAF031919-2	P1901513-002	Air	3/19/2019	17:00	SC02186	-3.04	3.70	X
HUCKIAFR031919-2	P1901513-003	Air	3/19/2019	17:00	AC02376	-2.75	3.75	X
HUCKIAF031919-3	P1901513-004	Air	3/19/2019	17:21	SC00071	-1.51	3.78	X
HUCKIAF031919-4	P1901513-005	Air	3/19/2019	17:07	AC02395	-2.62	3.77	X
HUCKIAF031919-5	P1901513-006	Air	3/19/2019	17:26	SSC00054	-1.61	3.85	X
HUCKIAF031919-6	P1901513-007	Air	3/19/2019	17:35	SSC00299	-1.86	3.76	X
HUCKAA031919-1	P1901513-008	Air	3/19/2019	15:20	SC01757	-1.38	3.74	X
HUCKAA031919-2	P1901513-009	Air	3/19/2019	17:41	SC02181	-1.40	3.89	X
TripBlank031919	P1901513-010	Air	3/19/2019	00:00	AS00312	-14.35	3.80	X

ALS Environmental **Sample Acceptance Check Form**

Client: WSP Group Work order: P1901513
 Project: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00
 Sample(s) received on: 3/22/19 Date opened: 3/22/19 by: CHRIS.GLEASON

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 <u>if necessary</u> 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
P1901513-001.01	6.0 L Silonite Can					
P1901513-002.01	6.0 L Source Can					
P1901513-003.01	6.0 L Ambient Can					
P1901513-004.01	6.0 L Source Can					
P1901513-005.01	6.0 L Ambient Can					
P1901513-006.01	6.0 L Silonite Can					
P1901513-007.01	6.0 L Silonite Can					
P1901513-008.01	6.0 L Source Can					
P1901513-009.01	6.0 L Source Can					
P1901513-010.01	6.0 L Ambient Can					

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

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

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

[illegible]

SAMPLE PREPARATION AND ANALYSIS SUMMARY

VOLATILE (VOA) ANALYSES

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Page 1 of 1

Company Name & Address (Reporting Information)								
WSP 7000 East Genesee Building D, 2nd Floor Foxcroftville, NY 13066 Brian Silber								
Project Manager Phone 315-655-3900 ext. 1 Fax								
Email Address for Result Reporting Brian.Silber@wsp.com & matt.hunter@wsp.com								
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. 91517								
ALS Contact: See Anderson								
Analysis Method Trichloroethene + trichloroethylene								
Comments e.g. Actual Preservative or specific instructions								
Project Name Federal - Mogul Former Tube Manufacturing								
Project Number 31401678.006 Task 02.00								
P.O.# / Billing Information WSP Environmental Accounts Payable 15530 Dulles Technology Drive Herndon, VA 20171 → USENVAAccountsPayable@usp.com								
Sampler (Print & Sign) Matthew Hunter John Bruscia								
Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Start Pressure "Hg	End Pressure "Hgpsig	Sample Volume
HUCKIAF031919-1	081919	081919	0832-	SAC00338	OAO0263	-30+	-6.5	31.91L
HUCKIAF031919-2		081919	0848-	SCO2186	OAO1193	-30+	-7.5	6.2
HUCKIAF031919-3		081919	0848-	ACO2376	OAO1112	-30+	-10	
HUCKIAF031919-4		0914-	1721	SC00071	OAO1399	-30	-4.5	
HUCKIAF031919-5		0901-	1707	ACO2395	OAO2091	-30+	-7	
HUCKIAF031919-6		0926-	1726	SAC00054	OAO0509	-30+	-5.5	
HUCKIAF031919-7		0918-	1735	ACO2114 SSC00294	OAO0814 OAO2127	-27.5	-4.5	
HUCKAAO31919-1		0938-	1520	SC01757	OAO045	-30+	-4.5	
HUCKAAO31919-2		0940-	1741	SC02181	OAO1028	-30+	-5	
Trip Blank O31919				ASCOB12				
Report Tier Levels - please select Tier I - Results (Default if not specified) Tier II (Results + QC Summaries) X Tier III (Results + QC & Calibration Summaries) Tier IV (Data Validation Package) 10% Surcharge F								
Relinquished by Signature Date: 3/19/19 Time: 1953								
Relinquished by Signature Date: 3/22/19 Time: 0930								
Chain of Custody Seal: (Circle) INTACT BROKEN ABSENT								
Units: kg/m ³								
EDD required Yes/No Type: Equis								
Received by: (Signature) Received by: (Signature)								
Project Requirements (MRLs, QAPP) reporting limits 0.2 ug/L = PEL 1 ug/L = PEL CL=1.2-1.5								
Cooler / Blank Temperature °C								

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: WSP Group

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901513

Test Code: EPA TO-15

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

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister(s) / 6.0 L Summa Canister(s)

Test Notes:

Date(s) Collected: 3/19/19

Date(s) Received: 3/22/19

Date(s) Analyzed: 3/22 - 3/23/19

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		Percent Recovered	Percent Recovered	Percent Recovered		
Method Blank	P190322-MB	101	103	101	70-130	
Lab Control Sample	P190322-LCS	101	103	100	70-130	
HUCKIAF031919-1	P1901513-001	102	103	105	70-130	
HUCKIAF031919-2	P1901513-002	102	101	105	70-130	
HUCKIAFR031919-2	P1901513-003	101	101	106	70-130	
HUCKIAF031919-3	P1901513-004	101	103	105	70-130	
HUCKIAF031919-4	P1901513-005	77	102	104	70-130	
HUCKIAF031919-5	P1901513-006	99	105	107	70-130	
HUCKIAF031919-6	P1901513-007	102	103	105	70-130	
HUCKAA031919-1	P1901513-008	99	103	102	70-130	
HUCKAA031919-2	P1901513-009	101	104	106	70-130	
TripBlank031919	P1901513-010	99	104	106	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

Page 1 of 1

Client: WSP Group

Client Sample ID: Lab Control Sample

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P190322-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: 3/22/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 0.125 Liter(s)

Test Notes:

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	211	212	100	67-110	
79-01-6	Trichloroethene	213	209	98	66-108	
127-18-4	Tetrachloroethene	213	212	100	55-120	

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

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group ALS Project ID: P1901513
Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Method Blank Summary

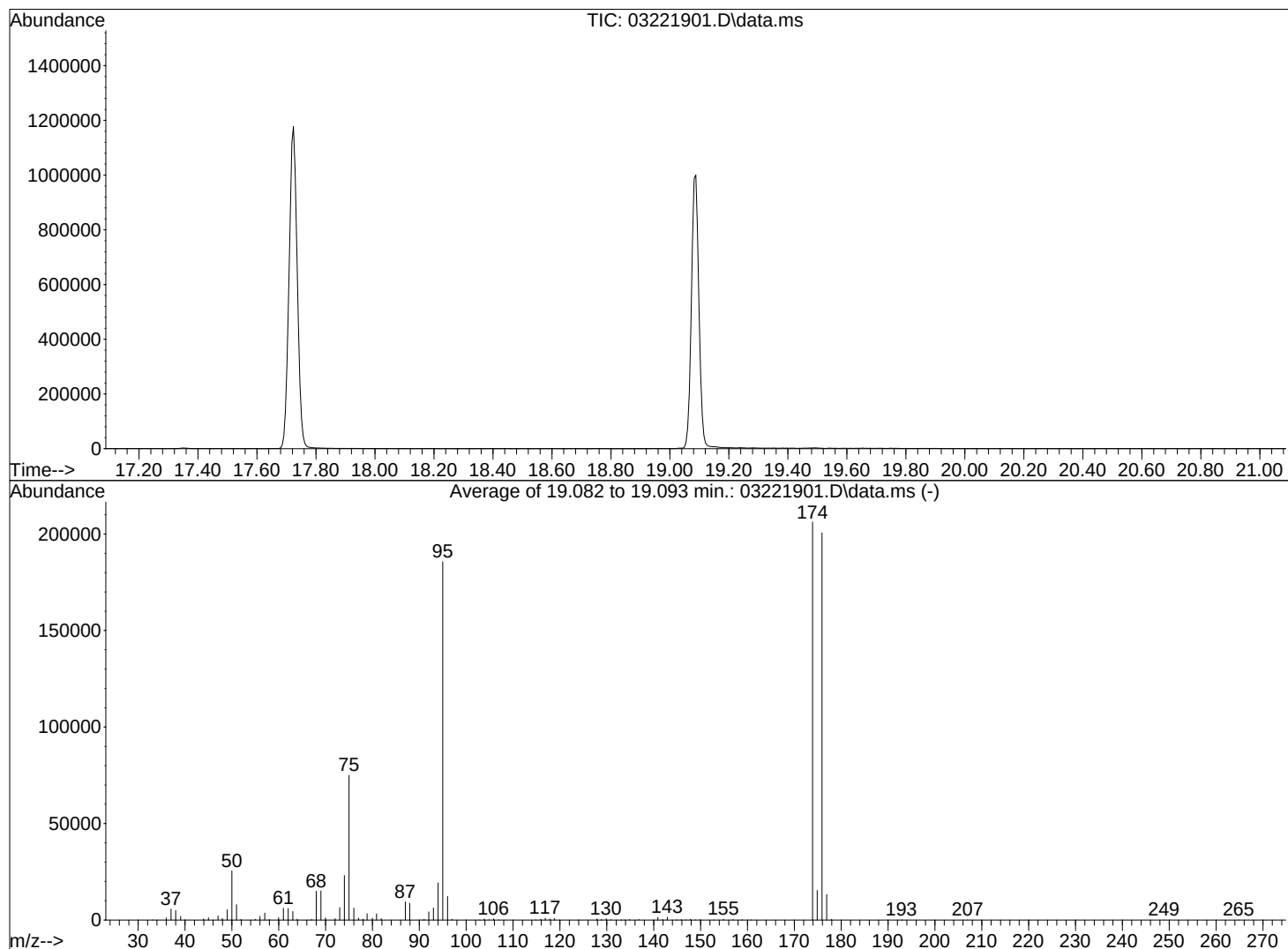
Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/6890N/MS16 Lab File ID: 03221914.D
Analyst: Lusine Hakobyan Date Analyzed: 3/22/19
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 08:36
Test Notes:

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P190322-LCS	03221915.D	09:09
HUCKIAF031919-1	P1901513-001	03221929.D	19:31
HUCKIAF031919-2	P1901513-002	03221930.D	20:05
HUCKIAFR031919-2	P1901513-003	03221931.D	20:38
HUCKIAF031919-3	P1901513-004	03221932.D	21:12
HUCKIAF031919-4	P1901513-005	03221934.D	22:19
HUCKIAF031919-5	P1901513-006	03221935.D	22:53
HUCKIAF031919-6	P1901513-007	03221936.D	23:26
HUCKAA031919-1	P1901513-008	03221937.D	00:00
HUCKAA031919-2	P1901513-009	03221939.D	01:07
TripBlank031919	P1901513-010	03221941.D	02:14

Data Path : I:\MS16\DATA\2019 03\22\
 Data File : 03221901.D
 Acq On : 22 Mar 2019 1:24
 Operator : LH
 Sample : 12.5ng TO-15 BFB
 Misc : S31-02111911
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16032219.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Mar 19 18:21:59 2019



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2828

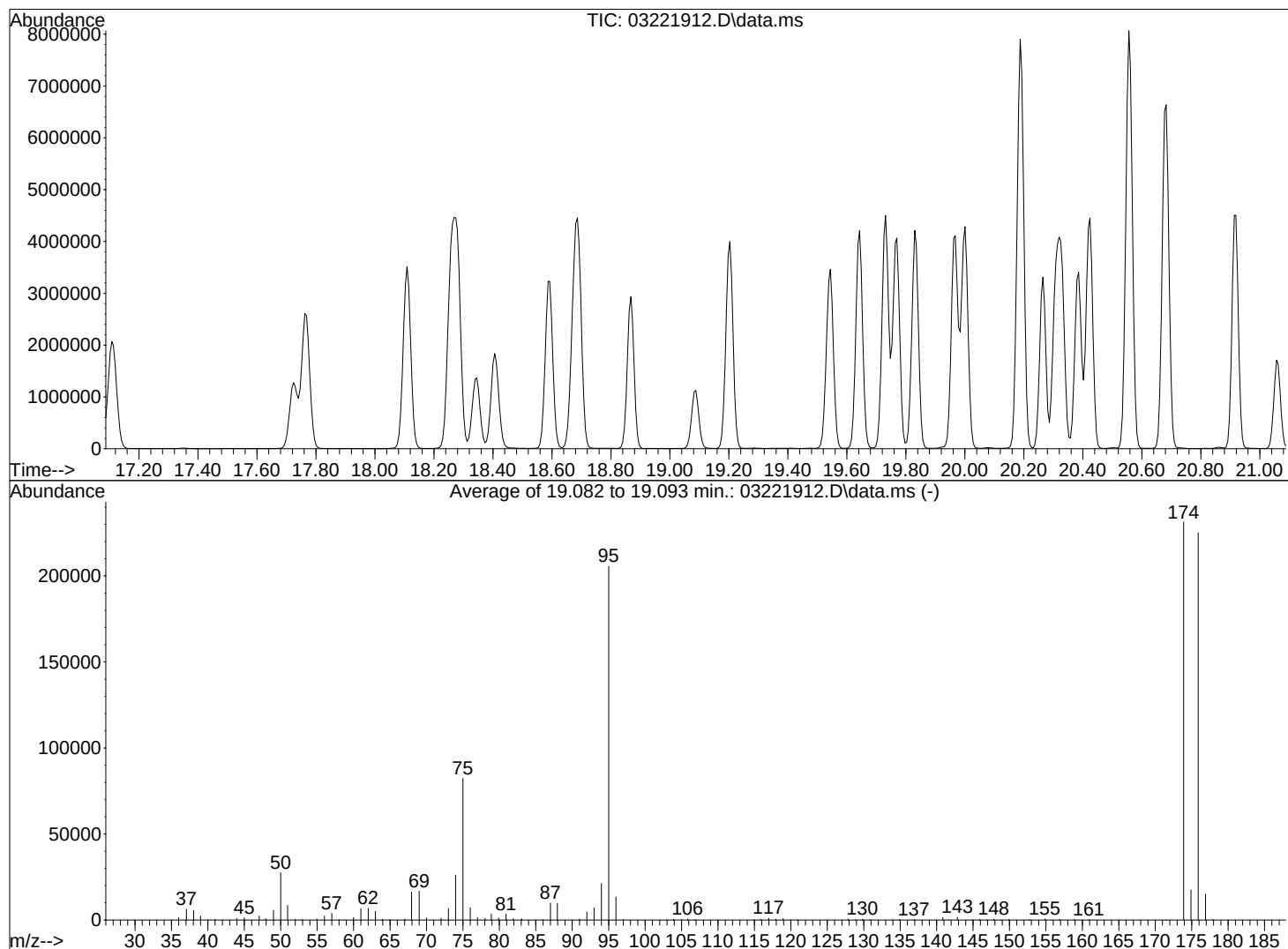
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.7	25496	PASS
75	95	30	66	40.4	74920	PASS
95	95	100	100	100.0	185600	PASS
96	95	5	9	6.6	12253	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	111.1	206251	PASS
175	174	4	9	7.5	15397	PASS
176	174	93	101	97.2	200533	PASS
177	176	5	9	6.6	13264	PASS

LH 3/22/19

Data Path : I:\MS16\DATA\2019 03\22\
 Data File : 03221912.D
 Acq On : 22 Mar 2019 7:29
 Operator : LH
 Sample : CCV R16032219 25ng
 Misc : S31-02111911/S31-03181909 (4/16)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16032219.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Mar 22 11:09:04 2019



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2828

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.4	27515	PASS
75	95	30	66	40.0	82331	PASS
95	95	100	100	100.0	205611	PASS
96	95	5	9	6.5	13374	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	112.5	231360	PASS
175	174	4	9	7.5	17443	PASS
176	174	93	101	97.3	225152	PASS
177	176	5	9	6.7	14977	PASS

LH 3/25/19

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Internal Standard Area and RT Summary

Test Code: EPA TO-15

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

Lab File ID: 03221912.D

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Silonite Canister(s)

Time Analyzed: 07:29

Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	# RT	AREA	# RT	AREA	# RT
24 Hour Standard	259023	11.33	1004413	13.43	440532	17.72
Upper Limit	362632	11.66	1406178	13.76	616745	18.05
Lower Limit	155414	11.00	602648	13.10	264319	17.39

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	# RT	AREA	# RT	AREA	# RT
01	Method Blank	233299	11.32	1000150	13.43	400972	17.72
02	Lab Control Sample	228877	11.33	956011	13.43	382332	17.72
03	HUCKIAF031919-1	200475	11.32	852644	13.43	340281	17.72
04	HUCKIAF031919-2	197323	11.32	837000	13.43	342429	17.72
05	HUCKIAFR031919-2	201571	11.32	849085	13.43	347581	17.72
06	HUCKIAF031919-3	198694	11.32	838679	13.43	336793	17.72
07	HUCKIAF031919-4	265738	11.33	847418	13.43	349406	17.72
08	HUCKIAF031919-5	213064	11.32	896281	13.43	351367	17.72
09	HUCKIAF031919-6	201297	11.31	883584	13.43	359728	17.72
10	HUCKAA031919-1	209919	11.31	865483	13.43	353381	17.72
11	HUCKAA031919-2	195765	11.32	832341	13.43	340230	17.72
12	TripBlank031919	203043	11.32	856118	13.43	338244	17.72
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.

ALS Environmental - Simi Valley **Method Detection Limit (MDL) Study**

Analytical Method: EPA TO-15 Scan
Matrix: Air
Instrument(s): MS08, MS09, MS13, MS16
Units: ug/m3
Data Date Range: 11/14/17 - 03/20/18

	Spike Level (ug/m3)	Number of Results (n)	Mean	Mean % Rec.	Std Dev	%RSD	MW	MDL _R (ug/m3)	MDL _R (ppbv)
Propene	0.1659	8	0.1684	101.4796	0.0411	24.3989	42.08	0.13	0.076
Dichlorodifluoromethane	0.3144	8	0.2830	90.0127	0.0290	10.2465	120.90	0.087	0.018
Chloromethane	0.3018	8	0.2810	93.1080	0.0285	10.1301	50.49	0.086	0.042
Freon 114	0.3063	8	0.2660	86.8430	0.0277	10.4222	170.90	0.084	0.012
Vinyl Chloride	0.1651	8	0.1508	91.2972	0.0188	12.4796	62.50	0.057	0.022
1,3-Butadiene	0.3177	8	0.2651	83.4514	0.0291	10.9697	54.09	0.088	0.040
Bromomethane	0.2979	8	0.2589	86.9000	0.0245	9.4675	94.94	0.074	0.019
Chloroethane	0.1619	8	0.1513	93.4103	0.0217	14.3716	64.52	0.066	0.025
Ethanol	0.8434	8	0.7743	91.8054	0.1203	15.5431	46.07	0.37	0.20
Acetonitrile	0.3177	8	0.3016	94.9402	0.0432	14.3181	41.05	0.13	0.077
Acrolein	0.3162	8	0.2734	86.4564	0.0491	17.9597	56.06	0.15	0.065
Acetone	NA (MB)	8	0.4159	NA	0.2379	57.2154	58.08	1.2	0.51
Trichlorofluoromethane	0.1682	8	0.1590	94.5528	0.0267	16.8223	137.40	0.081	0.014
Isopropanol	0.6321	8	0.5943	94.0120	0.0712	11.9784	60.10	0.22	0.090
Acrylonitrile	0.3168	8	0.2550	80.4924	0.0357	13.9926	53.06	0.11	0.051
1,1-Dichloroethene	0.1061	8	0.1045	98.4920	0.0245	23.4010	96.94	0.074	0.019
tert-Butanol	0.6360	8	0.5920	93.0818	0.0502	8.4777	74.12	0.16	0.053
Methylene Chloride	NA (MB)	8	0.0930	NA	0.0186	20.0259	84.94	0.15	0.043
Allyl Chloride	0.1686	8	0.1510	89.5398	0.0237	15.7196	76.53	0.072	0.023
Trichlorotrifluoroethane	0.1685	8	0.1606	95.3377	0.0253	15.7496	187.38	0.076	0.0099
Carbon Disulfide	0.3189	8	0.3373	105.7542	0.0515	15.2812	76.14	0.16	0.051
trans-1,2-Dichloroethene	0.1730	8	0.1524	88.0984	0.0245	16.0713	96.94	0.074	0.019
1,1-Dichloroethane	0.3066	8	0.2759	89.9788	0.0257	9.3314	98.96	0.078	0.019
Methyl tert-Butyl Ether	0.3210	8	0.2894	90.1480	0.0209	7.2392	88.15	0.063	0.017
Vinyl Acetate	1.5843	8	1.1704	73.8733	0.3777	32.2735	86.09	1.2	0.34
2-Butanone	0.3156	8	0.2799	88.6803	0.0362	12.9427	72.11	0.11	0.037
cis-1,2-Dichloroethene	0.1707	8	0.1555	91.0848	0.0249	15.9869	96.94	0.075	0.019
Diisopropyl Ether	0.1065	8	0.1039	97.5352	0.0233	22.4032	102.18	0.070	0.017
Ethyl Acetate	0.6408	8	0.5554	86.6690	0.0930	16.7486	88.11	0.28	0.078
n-Hexane	0.1706	8	0.1750	102.6032	0.0341	19.4789	86.17	0.11	0.031
Chloroform	0.1698	8	0.1585	93.3671	0.0234	14.7346	119.40	0.071	0.015
Tetrahydrofuran	0.3192	8	0.3033	95.0031	0.0222	7.3139	72.11	0.067	0.023
Ethyl tert-Butyl Ether	0.3177	8	0.2834	89.1958	0.0212	7.4881	102.18	0.064	0.015
1,2-Dichloroethane	0.1055	8	0.0993	94.0758	0.0195	19.6095	98.96	0.059	0.015
1,1,1-Trichloroethane	0.3231	8	0.2744	84.9195	0.0220	8.0039	133.40	0.066	0.012
Isopropyl Acetate	0.6339	8	0.5565	87.7899	0.0553	9.9425	102.13	0.17	0.041
1-Butanol	0.3382	8	0.2546	75.2794	0.0446	17.5321	74.12	0.14	0.046
Benzene	0.3171	8	0.2785	87.8272	0.0254	9.1343	78.11	0.077	0.024
Carbon Tetrachloride	0.1696	8	0.1463	86.2323	0.0244	16.7077	153.80	0.074	0.012
Cyclohexane	0.6405	8	0.5643	88.0952	0.0471	8.3508	84.16	0.15	0.044
tert-Amyl Methyl Ether	0.3171	8	0.2843	89.6405	0.0217	7.6217	102.18	0.065	0.016
1,2-Dichloropropane	0.3198	8	0.2866	89.6263	0.0219	7.6550	113.00	0.066	0.014
Bromodichloromethane	0.3201	8	0.2633	82.2399	0.0255	9.6714	163.80	0.077	0.011
Trichloroethene	0.1061	8	0.1088	102.4976	0.0239	21.9578	131.40	0.072	0.013
1,4-Dioxane	0.1063	8	0.0878	82.5494	0.0208	23.7155	88.11	0.063	0.017
Isooctane	0.3180	8	0.2870	90.2516	0.0264	9.1979	114.23	0.080	0.017
Methyl Methacrylate	0.6336	8	0.5145	81.2027	0.0624	12.1269	100.12	0.19	0.046
n-Heptane	0.3195	8	0.2828	88.4977	0.0280	9.9095	100.20	0.085	0.021
cis-1,3-Dichloropropene	0.3360	8	0.2754	81.9568	0.0276	10.0148	111.00	0.083	0.018
4-Methyl-2-Pentanone	0.3177	8	0.2708	85.2219	0.0242	8.9447	100.20	0.073	0.018
trans-1,3-Dichloropropene	0.3201	8	0.2346	73.2974	0.0366	15.5902	111.00	0.11	0.024
1,1,2-Trichloroethane	0.3192	8	0.2798	87.6410	0.0178	6.3651	133.40	0.054	0.0099
Toluene	0.3162	8	0.2891	91.4374	0.0214	7.3868	92.14	0.065	0.017
2-Hexanone	0.3180	8	0.2736	86.0456	0.0219	8.0210	100.16	0.066	0.016
Dibromochloromethane	0.3183	8	0.2563	80.5058	0.0231	9.0246	208.30	0.070	0.0082
1,2-Dibromoethane	0.1702	8	0.1443	84.7333	0.0206	14.2542	187.90	0.062	0.0081
Butyl Acetate	0.1709	8	0.1516	88.7319	0.0242	15.9807	116.16	0.073	0.015
n-Octane	0.1696	8	0.1666	98.2459	0.0397	23.8489	114.23	0.12	0.026
Tetrachloroethene	0.1701	8	0.1575	92.6035	0.0228	14.4943	165.80	0.069	0.010
Chlorobenzene	0.1706	8	0.1624	95.2011	0.0234	14.3903	112.60	0.071	0.015
Ethylbenzene	0.1683	8	0.1584	94.0916	0.0250	15.7761	106.20	0.075	0.017
m- & p-Xylene	0.3397	8	0.3140	92.4399	0.0467	14.8637	106.20	0.14	0.032
Bromoform	0.3189	8	0.2293	71.8877	0.0350	15.2890	252.80	0.11	0.011
Styrene	0.1693	8	0.1423	84.0324	0.0286	20.1331	104.10	0.086	0.020
o-Xylene	0.1688	8	0.1553	91.9727	0.0255	16.4319	106.20	0.077	0.018

ALS Environmental - Simi Valley
Method Detection Limit (MDL) Study

n-Nonane	0.3162	8	0.2833	89.5794	0.0294	10.3821	128.26	0.089	0.017
1,1,2,2-Tetrachloroethane	0.1691	8	0.1439	85.0727	0.0246	17.0714	167.90	0.074	0.011
Cumene	0.1683	8	0.1565	92.9777	0.0254	16.2190	120.20	0.077	0.016
alpha-Pinene	0.1674	8	0.1505	89.9259	0.0271	17.9876	136.24	0.082	0.015
n-Propylbenzene	0.1702	8	0.1554	91.2682	0.0256	16.4697	120.19	0.077	0.016
3-Ethyltoluene	0.1680	8	0.1544	91.8899	0.0237	15.3835	120.20	0.072	0.015
4-Ethyltoluene	0.3147	8	0.2720	86.4315	0.0282	10.3596	120.20	0.085	0.017
1,3,5-Trimethylbenzene	0.1678	8	0.1541	91.8285	0.0257	16.6521	120.20	0.077	0.016
alpha-Methylstyrene	0.1678	8	0.1346	80.2103	0.0282	20.9832	118.19	0.085	0.018
2-Ethyltoluene	0.1696	8	0.1563	92.1285	0.0226	14.4401	120.20	0.068	0.014
1,2,4-Trimethylbenzene	0.1682	8	0.1545	91.8768	0.0246	15.9071	120.20	0.074	0.015
n-Decane	0.1694	8	0.1566	92.4369	0.0240	15.3306	142.28	0.072	0.012
Benzyl Chloride	0.3222	8	0.1845	57.2626	0.0400	21.6860	126.59	0.12	0.023
1,3-Dichlorobenzene	0.1714	8	0.1545	90.1611	0.0267	17.2638	147.00	0.080	0.013
1,4-Dichlorobenzene	0.1702	8	0.1546	90.8277	0.0271	17.4973	147.00	0.082	0.014
sec-Butylbenzene	0.1688	8	0.1568	92.8614	0.0240	15.3328	134.22	0.073	0.013
p-Isopropyltoluene	0.1642	8	0.1514	92.2119	0.0269	17.7680	134.22	0.081	0.015
1,2,3-Trimethylbenzene	0.1642	8	0.1481	90.2321	0.0241	16.2524	120.19	0.073	0.015
1,2-Dichlorobenzene	0.1733	8	0.1550	89.4506	0.0262	16.9189	147.00	0.079	0.013
d-Limonene	0.1005	8	0.0905	90.0498	0.0345	38.0992	136.24	0.11	0.020
1,2-Dibromo-3-Chloropropane	0.3153	8	0.2146	68.0701	0.0332	15.4650	236.33	0.10	0.010
n-Undecane	0.1685	8	0.1431	84.9507	0.0437	30.5431	156.31	0.14	0.022
1,2,4-Trichlorobenzene	0.3291	8	0.2576	78.2817	0.0426	16.5412	181.50	0.13	0.018
Naphthalene	0.1690	8	0.1259	74.4999	0.0431	34.2029	128.17	0.13	0.025
n-Dodecane	0.1690	8	0.1171	69.3211	0.0494	42.2196	170.34	0.15	0.022
Hexachloro-1,3-butadiene	0.3171	8	0.2688	84.7524	0.0352	13.1114	260.80	0.11	0.010
Cyclohexanone	0.3117	8	0.2625	84.2156	0.0274	10.4566	98.14	0.083	0.021
tert-Butylbenzene	0.3150	8	0.2748	87.2222	0.0265	9.6429	134.22	0.080	0.015
n-Butylbenzene	0.1686	8	0.1515	89.8363	0.0254	16.7543	134.22	0.077	0.014

Note: Method blanks evaluated per 2016 EPA MUR which ammended the MDL procedure in 40 CFR Appendix B. Any compounds with the spike level indicated as "NA (MB)" had a method blank MDL value higher than the calculated spike sample MDL.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-1

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-001

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SSC00338

Initial Pressure (psig): -2.20 Final Pressure (psig): 3.65

Container Dilution Factor: 1.47

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.14	0.16	0.11	0.034	0.041	0.028	J
79-01-6	Trichloroethene	5.2	0.16	0.11	0.96	0.030	0.020	
127-18-4	Tetrachloroethene	0.77	0.16	0.10	0.11	0.024	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.

Data File: I:\MS16\DATA\2019 03\22\03221929.D

Acq On : 22 Mar 2019 19:31

Operator: LH

Sample : P1901513-001 (1000mL)

Misc : S31-02111911

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 25 13:42:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/25/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	200475	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	852644	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	340281	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	246085	12.811	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.48%
57) Toluene-d8 (SS2)	15.87	98	801469	12.875	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.96%
73) Bromofluorobenzene (SS3)	19.09	174	346787	13.171	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.36%

Target Compounds

						Qvalue
2) Propene	4.04	42	16382	0.922	ng	94
3) Dichlorodifluoromethan...	4.22	85	54802	1.586	ng	100
4) Chloromethane	4.53	50	5283	0.195	ng	93
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1790	0.080	ng	88
6) Vinyl Chloride	4.97	62	111	N.D.		
7) 1,3-Butadiene	5.25	54	914	N.D.		
8) Bromomethane	5.71	94	586	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.41	45	291710	25.034	ng	99
11) Acetonitrile	6.73	41	6426	0.219	ng	# 70
12) Acrolein	6.92	56	3633	0.370	ng	99
13) Acetone	7.10	58	154422	11.998	ng	# 58
14) Trichlorofluoromethane	7.34	101	28413	0.925	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	43147	1.131	ng	96
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	8.56	84	343967	18.403	ng	95
20) 3-Chloro-1-propene (Al...	8.74	41	613	N.D.		
21) Trichlorotrifluoroethane	8.99	151	7170	0.367	ng	92
22) Carbon Disulfide	8.85	76	7377	0.111	ng	91
23) trans-1,2-Dichloroethene	9.86	61	981	N.D.		
24) 1,1-Dichloroethane	10.12	63	527	N.D.		
25) Methyl tert-Butyl Ether	10.25	73	824	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	85198	7.187	ng	96
28) cis-1,2-Dichloroethene	11.14	61	2201	0.092	ng	96
29) Diisopropyl Ether	11.43	87	467	N.D.		
30) Ethyl Acetate	11.43	61	17481	2.902	ng	98
31) n-Hexane	11.41	57	23532	0.861	ng	97
32) Chloroform	11.48	83	5956	0.192	ng	99
34) Tetrahydrofuran (THF)	11.92	72	4015	0.337	ng	# 77
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	2924	0.138	ng	96
38) 1,1,1-Trichloroethane	12.55	97	1378	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	58992	0.729	ng	98
42) Carbon Tetrachloride	13.19	117	7912	0.308	ng	99
43) Cyclohexane	13.32	84	7722	0.269	ng	97
44) tert-Amyl Methyl Ether	13.69	73	574	N.D.		
45) 1,2-Dichloropropane	13.88	63	416	N.D.		
46) Bromodichloromethane	14.09	83	1498	0.062	ng	# 71
47) Trichloroethene	14.13	130	83728	3.519	ng	100
48) 1,4-Dioxane	14.15	88	412	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2019 03\22\03221929.D

Acq On : 22 Mar 2019 19:31

Operator: LH

Sample : P1901513-001 (1000mL)

Misc : S31-02111911

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 25 13:42:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

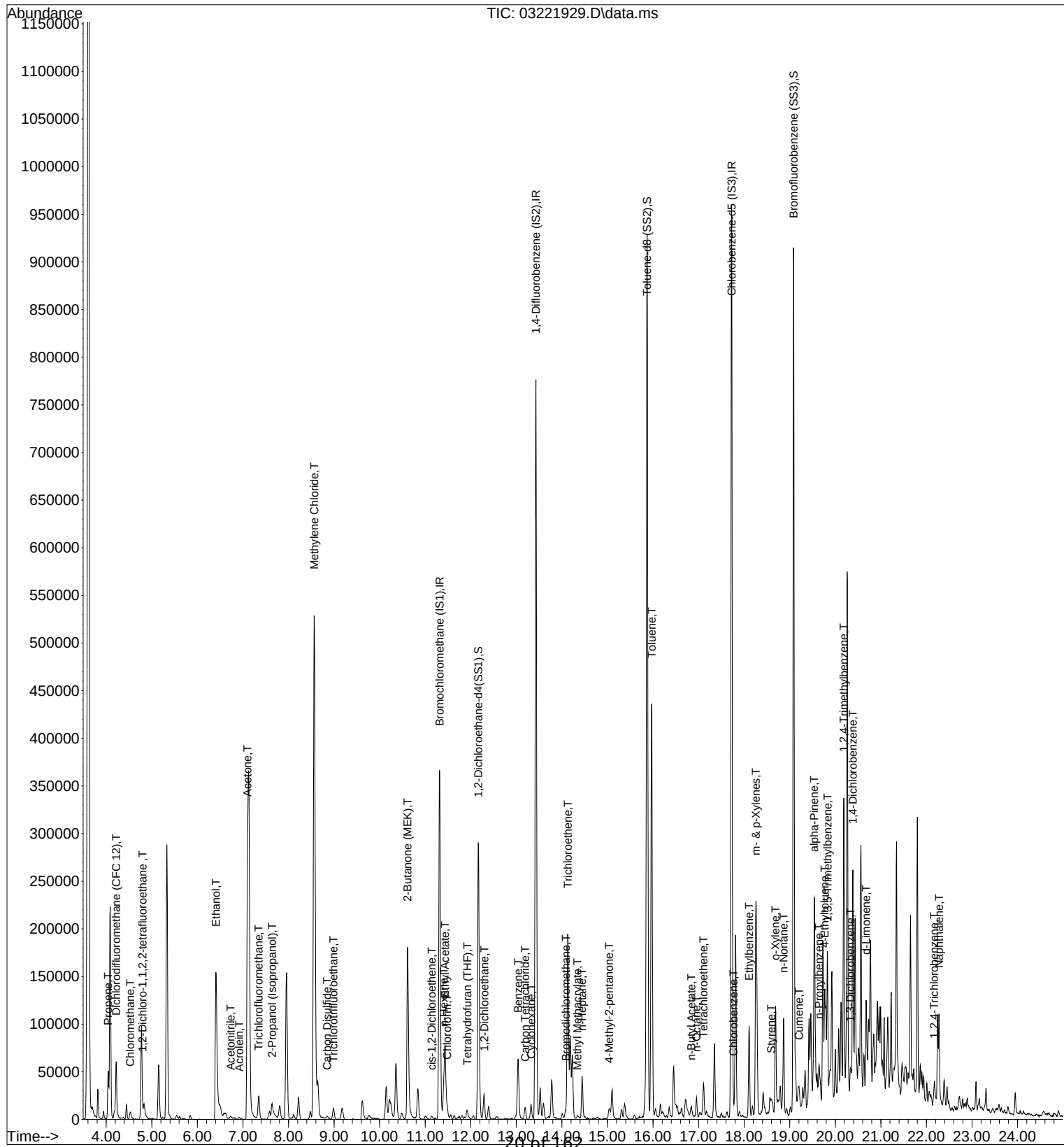
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	695	0.095	ng	# 40
51) n-Heptane	14.44	71	13566	0.790	ng	99
52) cis-1,3-Dichloropropene	15.00	75	328	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	3960	0.260	ng	86
54) trans-1,3-Dichloropropene	15.52	75	318	N.D.		
55) 1,1,2-Trichloroethane	15.70	97	166	N.D.		
58) Toluene	15.97	91	393777	5.237	ng	100
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	16.39	129	122	N.D.		
61) 1,2-Dibromoethane	16.66	107	544	N.D.		
62) n-Butyl Acetate	16.84	43	10624	0.308	ng	95
63) n-Octane	16.95	57	3957	0.285	ng	88
64) Tetrachloroethene	17.11	166	13515	0.527	ng	99
65) Chlorobenzene	17.77	112	3020	0.054	ng	73
66) Ethylbenzene	18.11	91	84563	0.958	ng	98
67) m- & p-Xylenes	18.26	91	200857	3.075	ng	96
68) Bromoform	18.34	173	828	N.D.		
69) Styrene	18.59	104	8406	0.157	ng	92
70) o-Xylene	18.69	91	67752	1.022	ng	99
71) n-Nonane	18.87	43	33104	1.095	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	882	N.D.		
74) Cumene	19.20	105	10157	0.115	ng	90
75) alpha-Pinene	19.54	93	91915	2.065	ng	85
76) n-Propylbenzene	19.64	91	32202	0.326	ng	96
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.76	105	39028	0.483	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	35054	0.500	ng	99
80) alpha-Methylstyrene	19.97	118	1697	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	114019	1.630	ng	88
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	1785	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	2569	0.055	ng	98
86) 1,4-Dichlorobenzene	20.39	146	96499	2.020	ng	100
87) sec-Butylbenzene	20.42	105	4348	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	20.68	146	2004	N.D.		
91) d-Limonene	20.68	68	15686	0.634	ng	86
92) 1,2-Dibromo-3-Chloropr...	21.06	157	409	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	22.17	180	3065	0.084	ng	97
95) Naphthalene	22.28	128	82298	0.777	ng	100
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.58	225	433	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.	d	

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

ALS Vial : 6 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2019 03\22\03221929.D

Acq On : 22 Mar 2019 19:31

Operator: LH

Sample : P1901513-001 (1000mL)

Misc : S31-02111911

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 25 10:55:44 2019

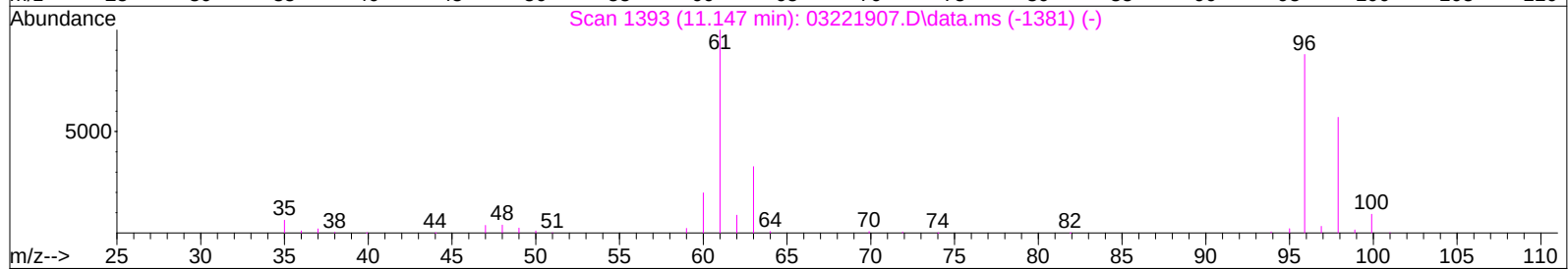
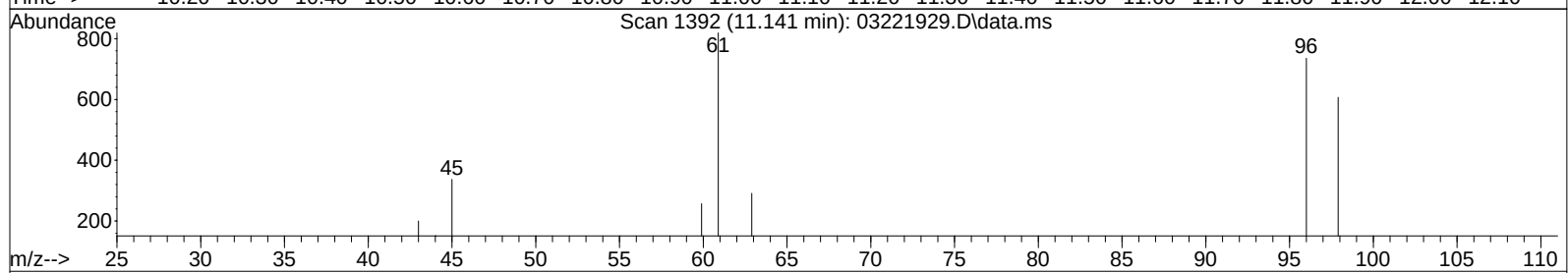
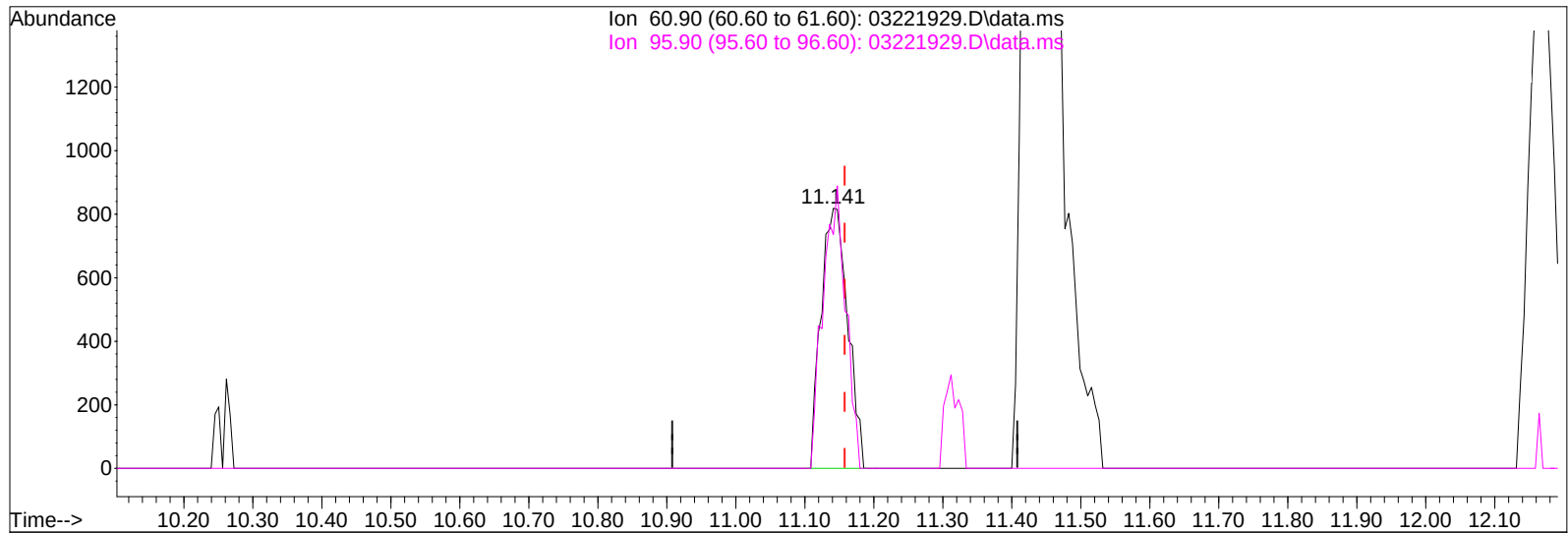
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221929.D\data.ms

(28) cis-1,2-Dichloroethene (T)

11.141min (-0.017) 0.09ng

response 2201

Ion	Exp%	Act%
60.90	100	100
95.90	88.00	92.19
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221929.D

Acq On : 22 Mar 2019 19:31

Operator: LH

Sample : P1901513-001 (1000mL)

Misc : S31-02111911

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 25 10:55:44 2019

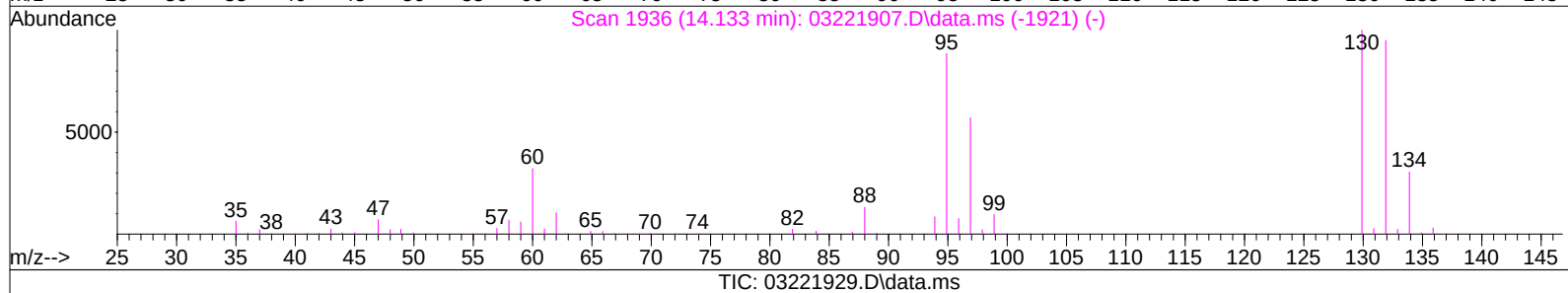
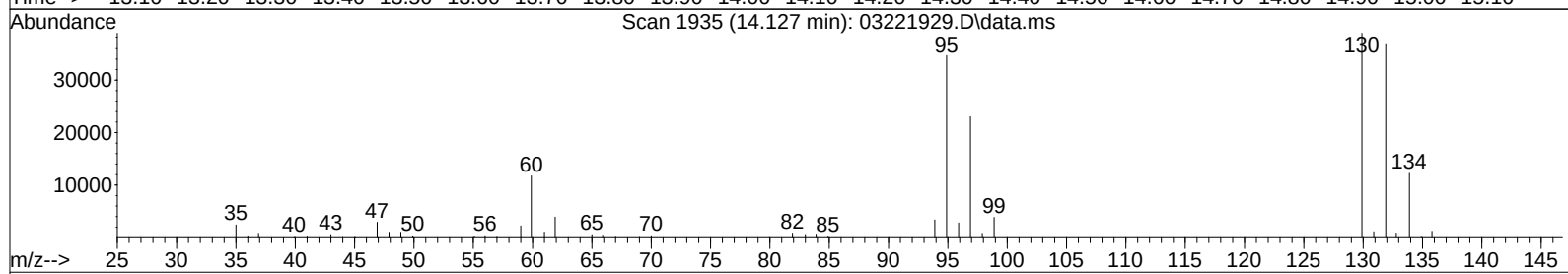
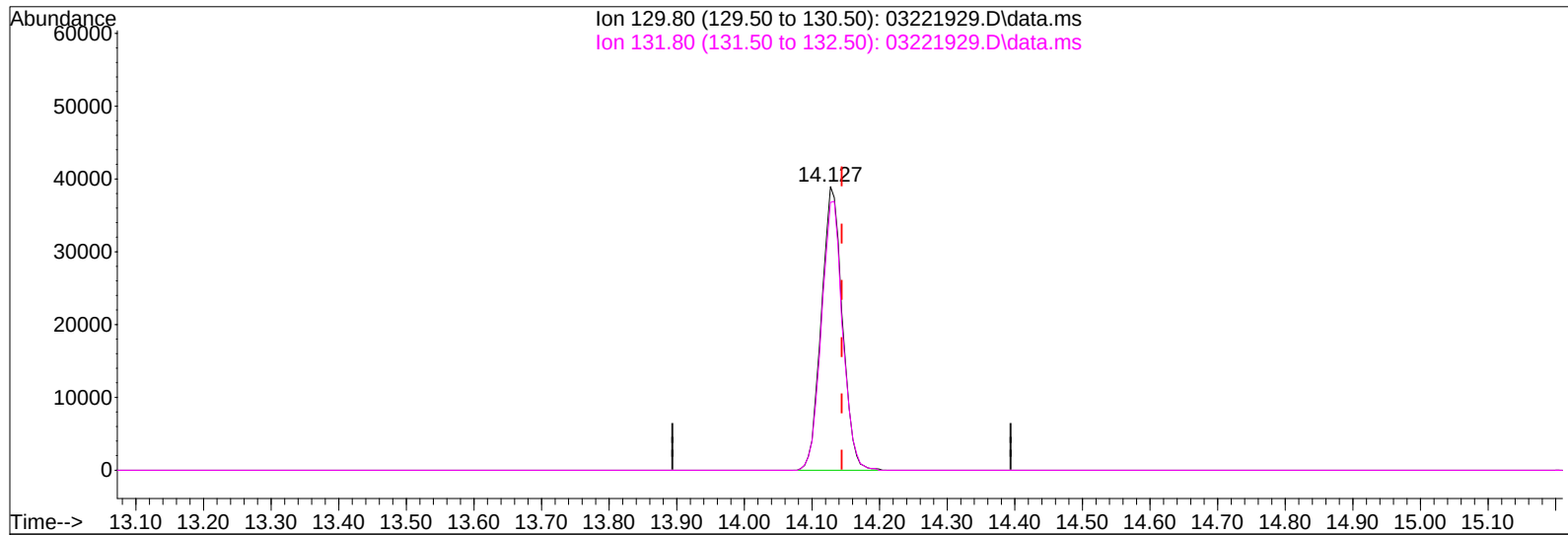
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221929.D\data.ms

(47) Trichloroethene (T)

14.127min (-0.017) 3.52ng

response 83728

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	95.56
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221929.D

Acq On : 22 Mar 2019 19:31

Operator: LH

Sample : P1901513-001 (1000mL)

Misc : S31-02111911

ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 25 10:55:44 2019

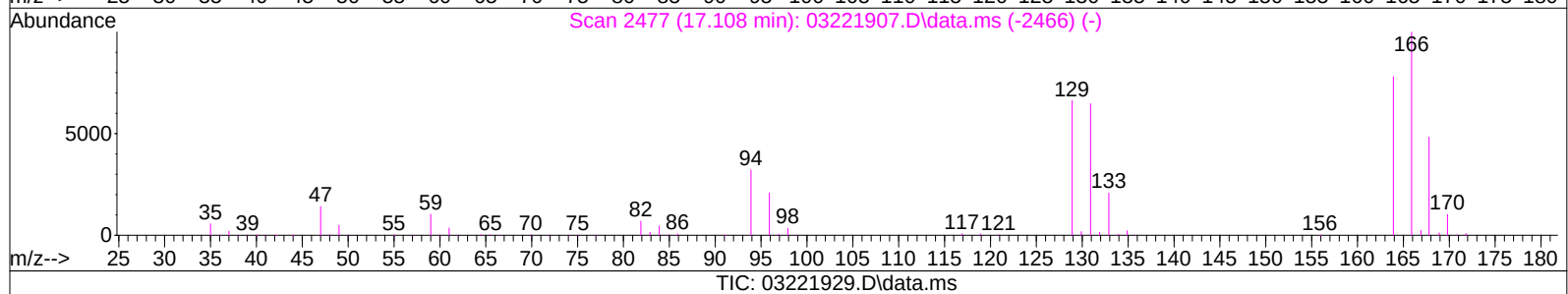
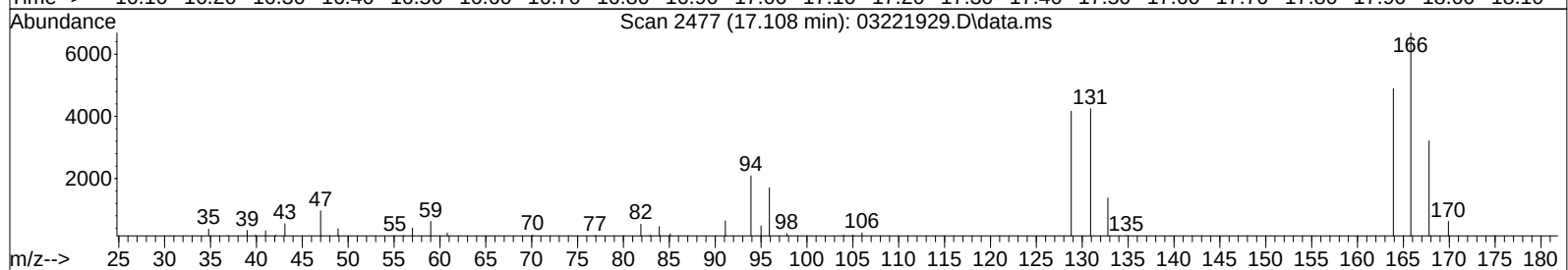
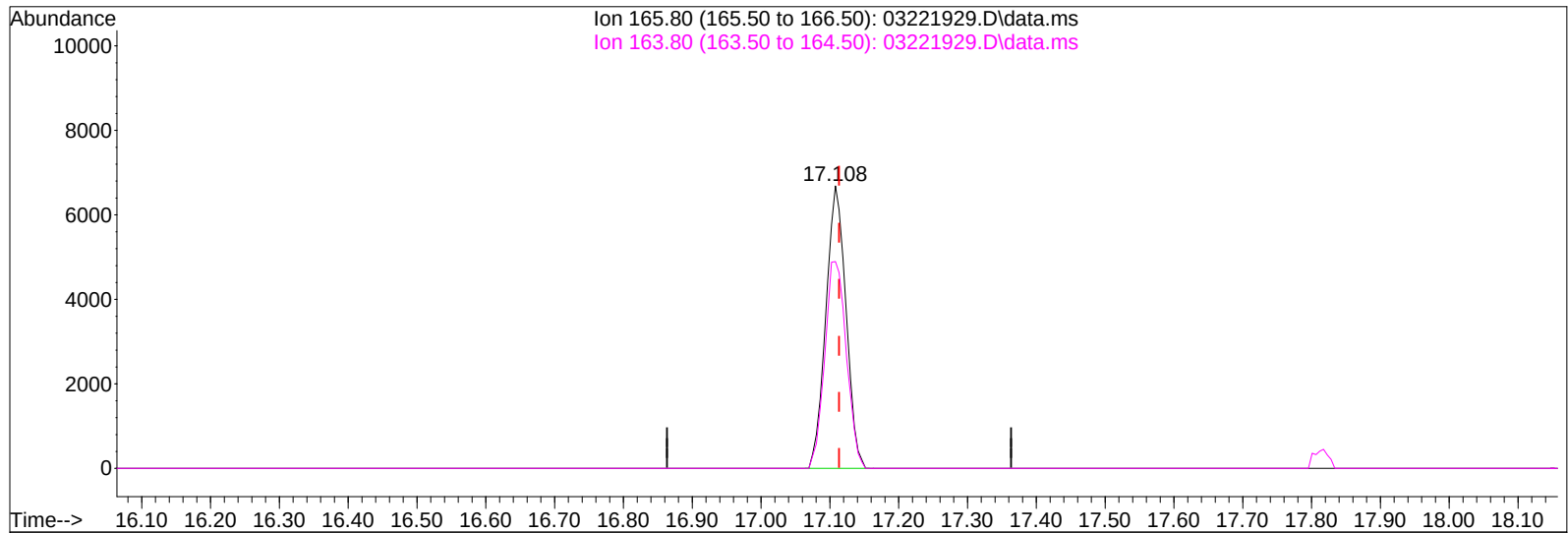
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221929.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.006) 0.53ng

response 13515

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	78.90
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-2

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-002

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC02186

Initial Pressure (psig): -3.04 Final Pressure (psig): 3.70

Container Dilution Factor: 1.58

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.13	0.17	0.12	0.033	0.044	0.030	J
79-01-6	Trichloroethene	4.8	0.17	0.11	0.89	0.032	0.021	
127-18-4	Tetrachloroethene	0.79	0.17	0.11	0.12	0.026	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.

Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 13:47:24 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	197323	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	837000	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	342429	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	241227	12.758	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.08%
57) Toluene-d8 (SS2)	15.87	98	787707	12.574	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.56%
73) Bromofluorobenzene (SS3)	19.09	174	347233	13.105	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.80%

Target Compounds

						Qvalue
2) Propene	4.05	42	33802	1.932	ng	97
3) Dichlorodifluoromethan...	4.22	85	52282	1.537	ng	99
4) Chloromethane	4.53	50	5070	0.190	ng	95
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1700	0.077	ng	81
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.25	54	1189	0.066	ng	# 80
8) Bromomethane	5.71	94	325	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.47	45	3489069	304.214	ng	99
11) Acetonitrile	6.74	41	3650	0.126	ng	# 56
12) Acrolein	6.92	56	3390	0.351	ng	100
13) Acetone	7.11	58	157415	12.426	ng	# 64
14) Trichlorofluoromethane	7.35	101	26623	0.881	ng	99
15) 2-Propanol (Isopropanol)	7.64	45	143317	3.818	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	8.57	84	308522	16.770	ng	95
20) 3-Chloro-1-propene (Al...	8.73	41	182	N.D.		
21) Trichlorotrifluoroethane	9.00	151	6359	0.330	ng	97
22) Carbon Disulfide	8.86	76	9201	0.140	ng	93
23) trans-1,2-Dichloroethene	9.87	61	725	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	10.25	73	559	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	79969	6.853	ng	98
28) cis-1,2-Dichloroethene	11.15	61	1949	0.083	ng	100
29) Diisopropyl Ether	11.44	87	662	N.D.		
30) Ethyl Acetate	11.44	61	37067	6.252	ng	98
31) n-Hexane	11.41	57	21490	0.798	ng	97
32) Chloroform	11.48	83	8426	0.275	ng	100
34) Tetrahydrofuran (THF)	11.92	72	3351	0.286	ng	# 90
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	2503	0.120	ng	97
38) 1,1,1-Trichloroethane	12.55	97	1290	N.D.		
39) Isopropyl Acetate	13.02	61	444	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	57083	0.718	ng	99
42) Carbon Tetrachloride	13.20	117	7379	0.293	ng	100
43) Cyclohexane	13.32	84	10047	0.357	ng	98
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.89	63	336	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.13	130	70594	3.022	ng	98
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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Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 13:47:24 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	122	N.D.		
51) n-Heptane	14.45	71	12791	0.759	ng	97
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	5345	0.357	ng	83
54) trans-1,3-Dichloropropene	15.52	75	104	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	404100	5.340	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	16.84	43	11822	0.341	ng	96
63) n-Octane	16.95	57	4841	0.346	ng	95
64) Tetrachloroethene	17.11	166	12850	0.498	ng	99
65) Chlorobenzene	17.77	112	2069	N.D.		
66) Ethylbenzene	18.11	91	81173	0.914	ng	100
67) m- & p-Xylenes	18.26	91	197398	3.003	ng	96
68) Bromoform	18.35	173	646	N.D.		
69) Styrene	18.59	104	8999	0.167	ng	97
70) o-Xylene	18.69	91	69547	1.043	ng	97
71) n-Nonane	18.87	43	50498	1.660	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	630	N.D.		
74) Cumene	19.20	105	9027	0.101	ng	85
75) alpha-Pinene	19.54	93	88788	1.982	ng	75
76) n-Propylbenzene	19.64	91	31719	0.319	ng	98
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.77	105	38317	0.471	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	33672	0.478	ng	99
80) alpha-Methylstyrene	19.97	118	1259	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	113682	1.615	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.32	91	957	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	1410	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	94895	1.974	ng	100
87) sec-Butylbenzene	20.42	105	3941	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	20.68	146	1135	N.D.		
91) d-Limonene	20.68	68	32171	1.293	ng	93
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	22.17	180	1902	0.052	ng	91
95) Naphthalene	22.28	128	101576	0.953	ng	99
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.58	225	158	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.	d	

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

Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 13:47:24 2019

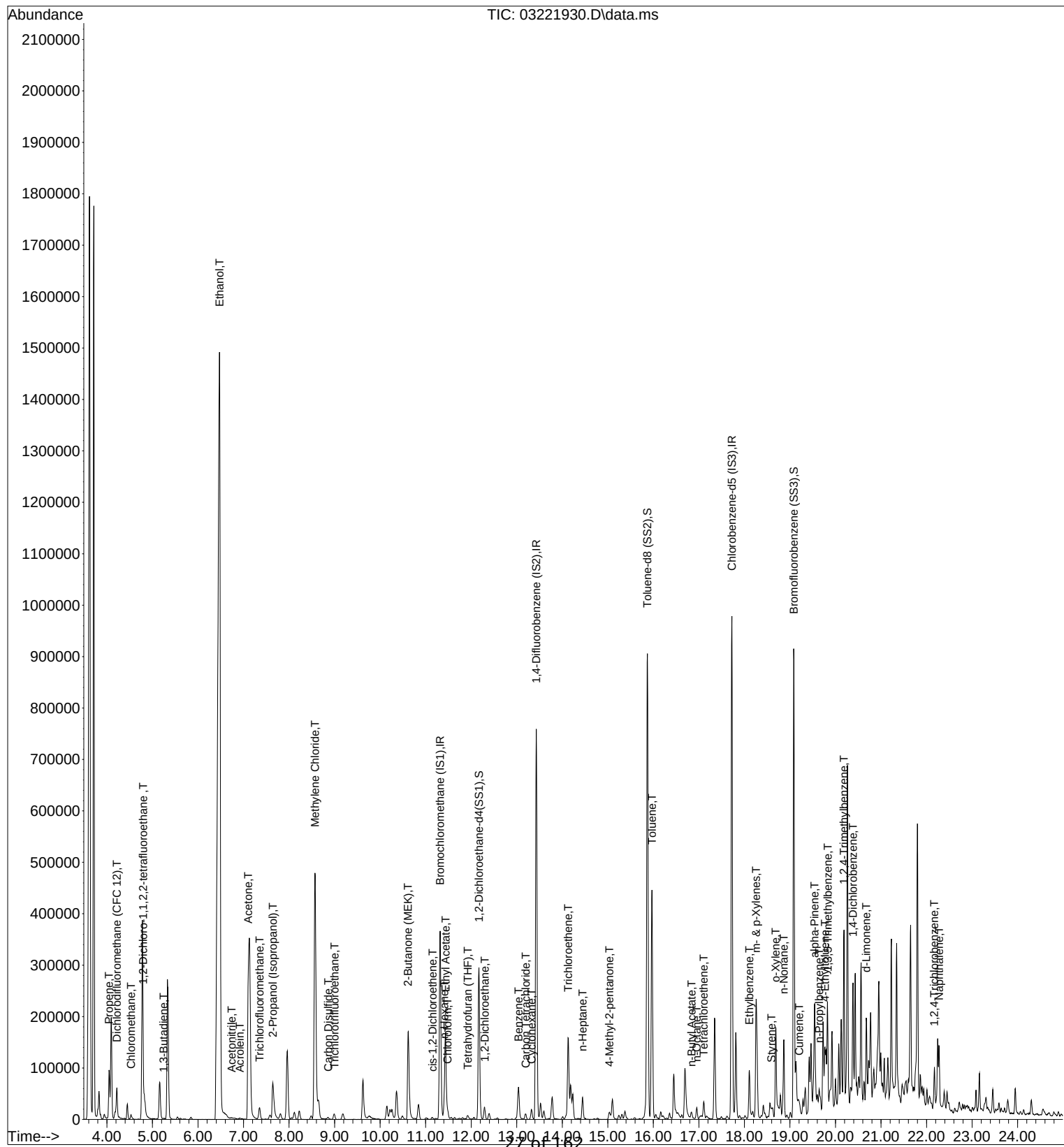
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 10:55:47 2019

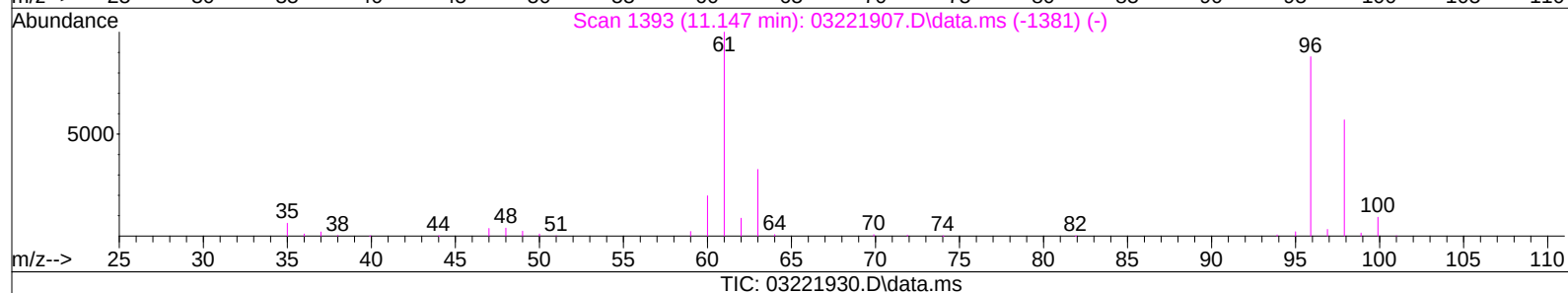
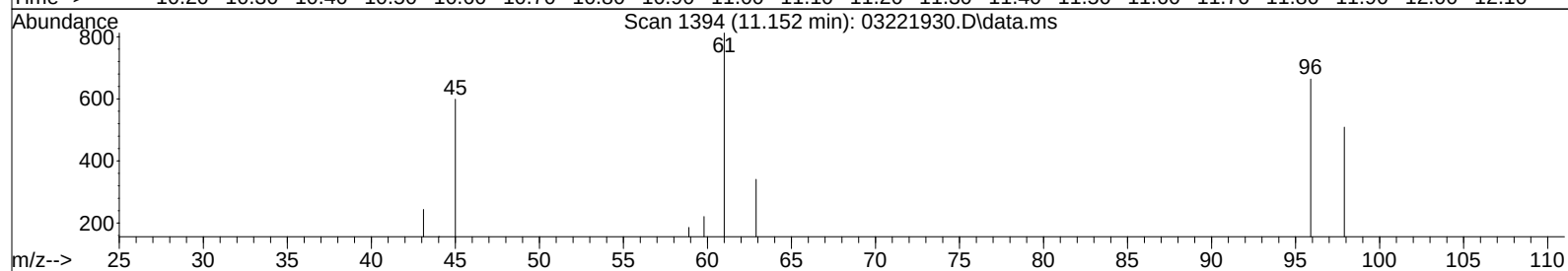
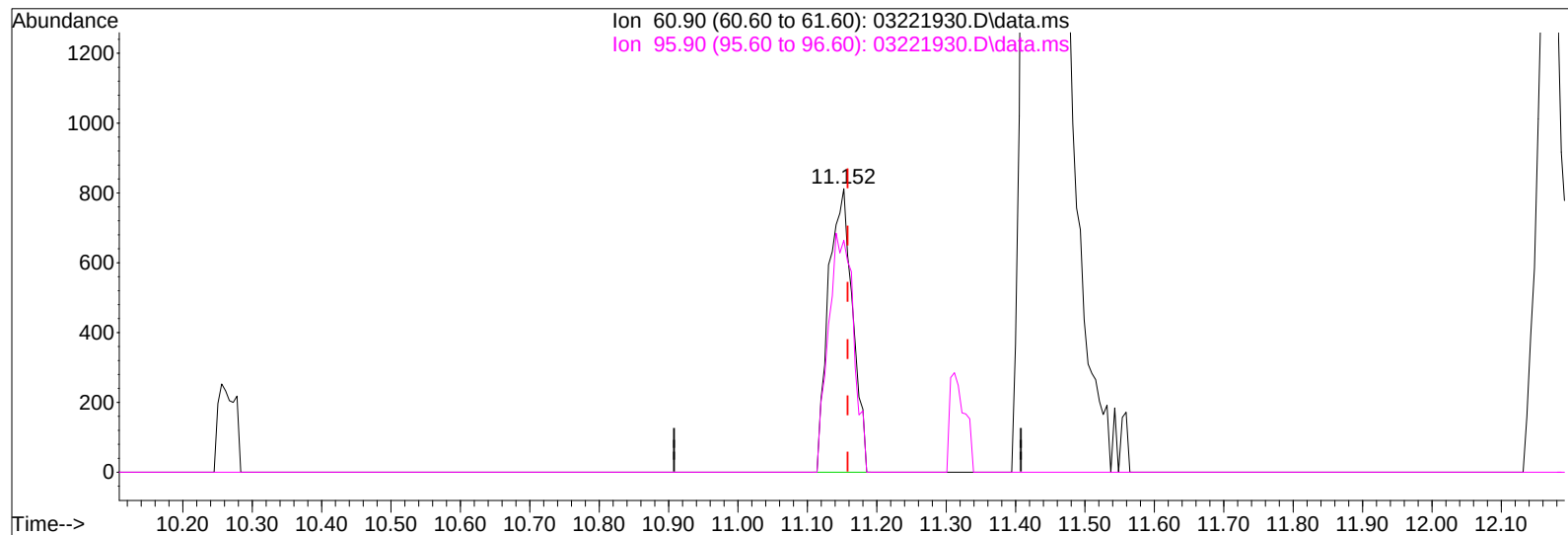
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



(28) cis-1,2-Dichloroethene (T)

11.152min (-0.006) 0.08ng

response 1949

Ion	Exp%	Act%
60.90	100	100
95.90	88.00	88.05
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 10:55:47 2019

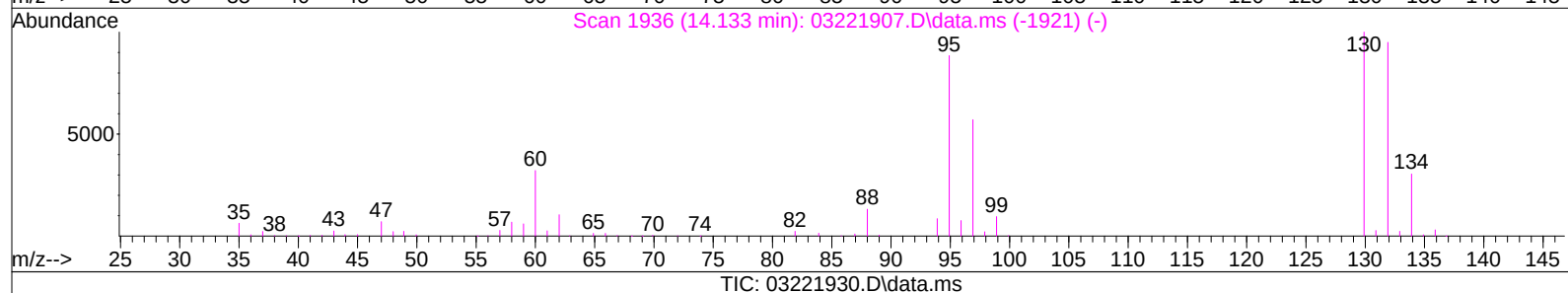
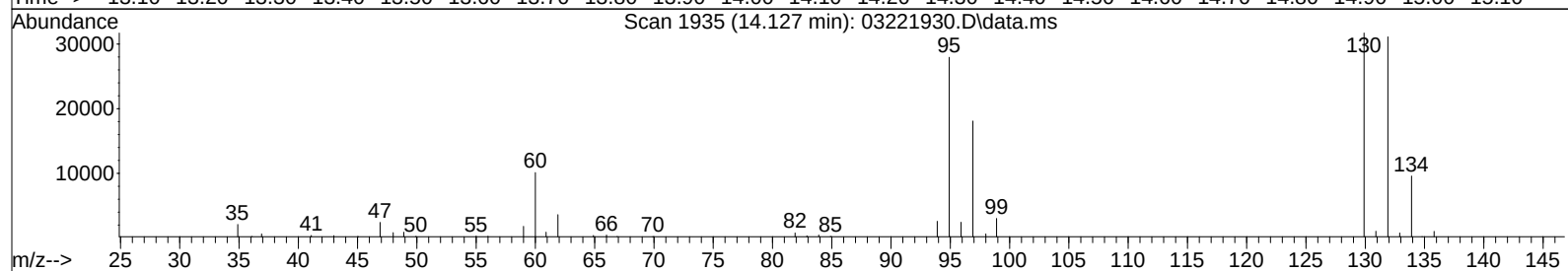
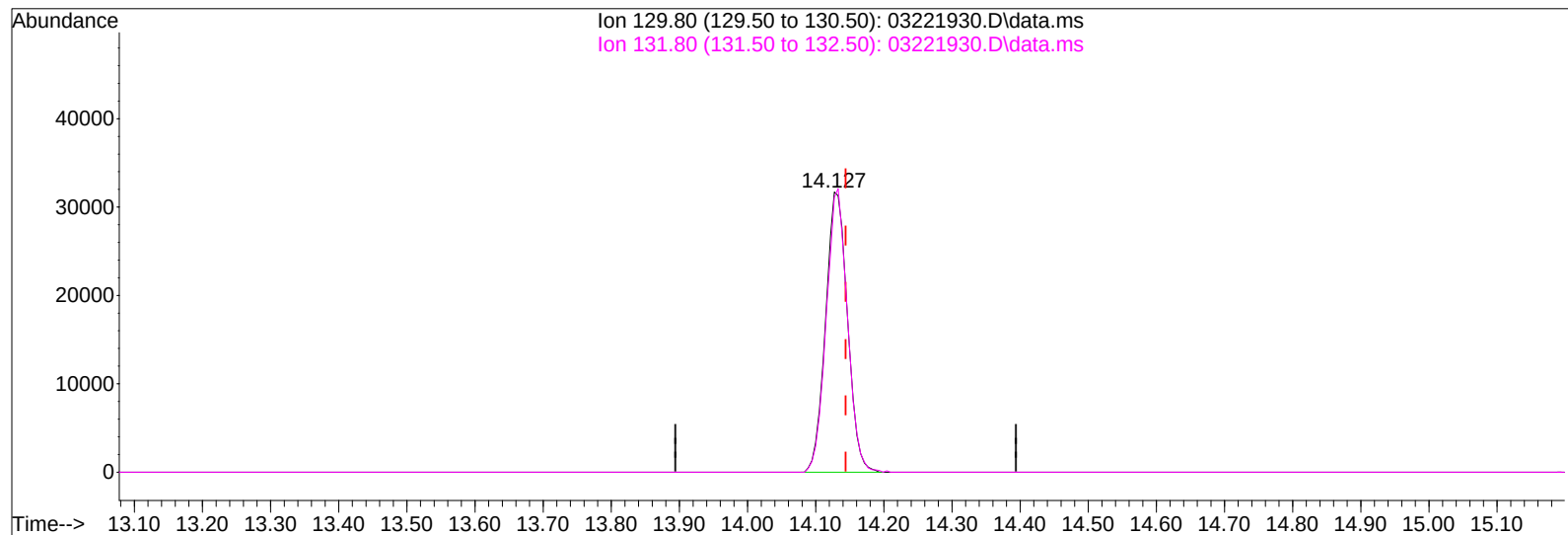
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221930.D\data.ms

(47) Trichloroethene (T)

14.127min (-0.017) 3.02ng

response 70594

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	97.80
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221930.D

Acq On : 22 Mar 2019 20:05

Operator: LH

Sample : P1901513-002 (1000mL)

Misc : S31-02111911

ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 25 10:55:47 2019

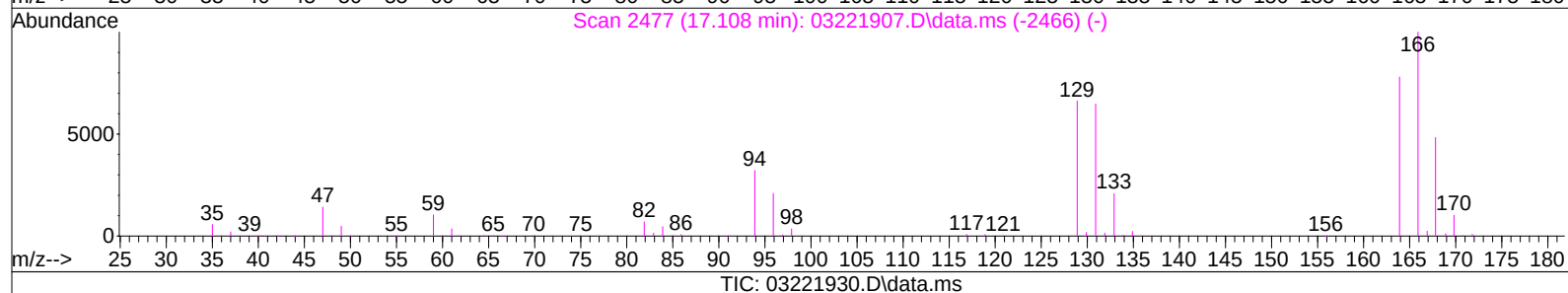
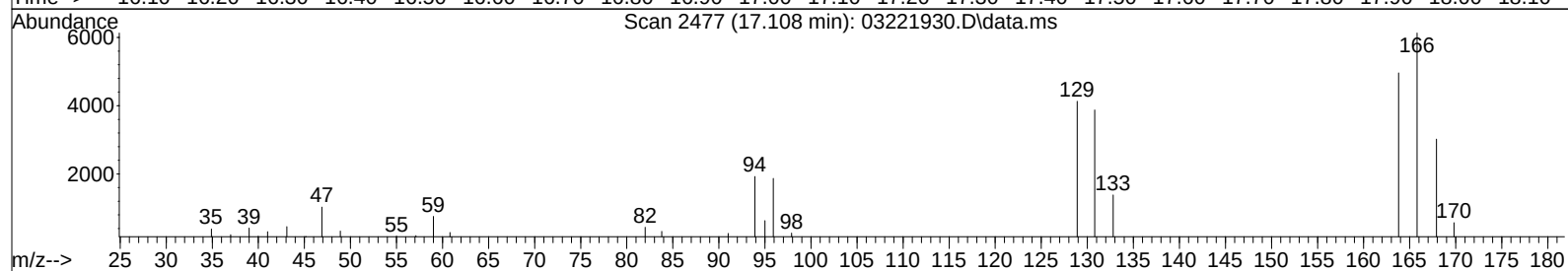
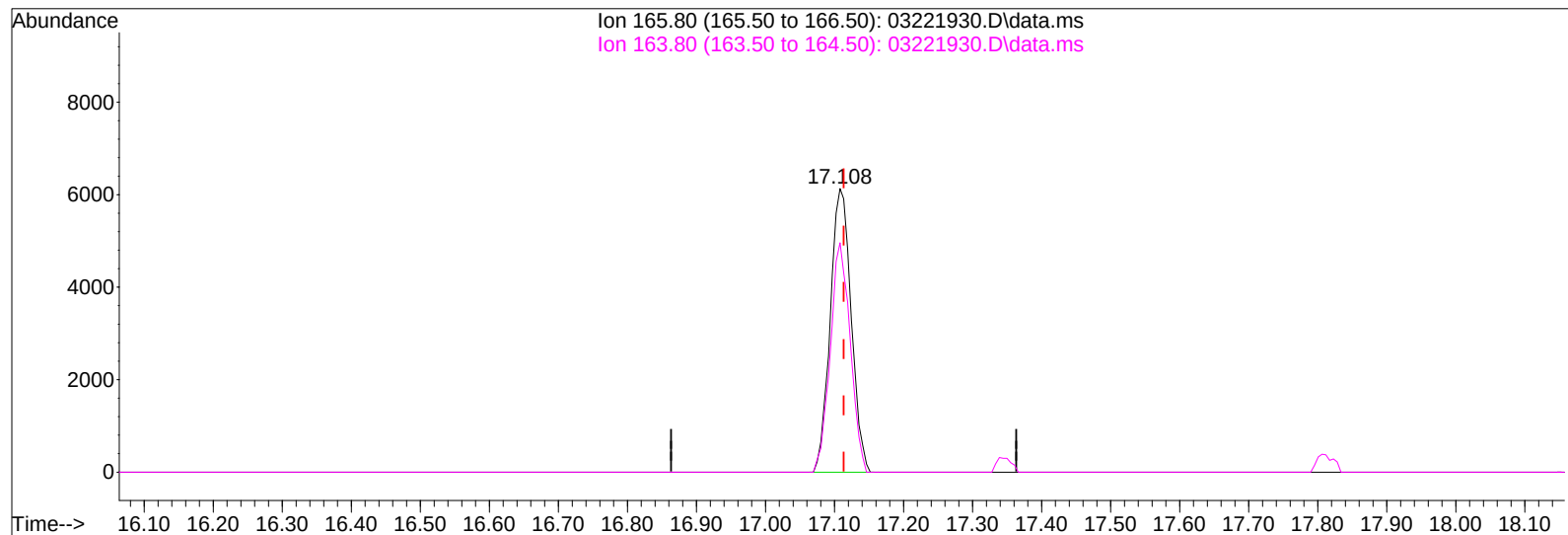
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221930.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.006) 0.50ng

response 12850

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	77.14
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAFR031919-2

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-003

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AC02376

Initial Pressure (psig): -2.75 Final Pressure (psig): 3.75

Container Dilution Factor: 1.54

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.12	0.17	0.12	0.030	0.043	0.029	J
79-01-6	Trichloroethene	4.8	0.17	0.11	0.88	0.032	0.021	
127-18-4	Tetrachloroethene	0.79	0.17	0.11	0.12	0.025	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.

Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 13:49:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/25/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	201571	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	849085	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	347581	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	244387	12.653	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%
57) Toluene-d8 (SS2)	15.87	98	801817	12.610	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.88%
73) Bromofluorobenzene (SS3)	19.08	174	354941	13.197	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.60%

Target Compounds

						Qvalue
2) Propene	4.04	42	30840	1.726	ng	98
3) Dichlorodifluoromethan...	4.21	85	53666	1.545	ng	99
4) Chloromethane	4.53	50	4989	0.183	ng	91
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1676	0.075	ng	86
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.25	54	1317	0.072	ng	# 81
8) Bromomethane	5.71	94	301	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.47	45	3505010	299.164	ng	99
11) Acetonitrile	6.74	41	2729	0.092	ng	# 70
12) Acrolein	6.91	56	3238	0.328	ng	94
13) Acetone	7.10	58	158408	12.241	ng	# 62
14) Trichlorofluoromethane	7.35	101	27304	0.884	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	132403	3.453	ng	95
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	8.57	84	312618	16.635	ng	97
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.99	151	6427	0.327	ng	96
22) Carbon Disulfide	8.86	76	5544	0.083	ng	82
23) trans-1,2-Dichloroethene	9.86	61	619	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	10.26	73	604	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	79686	6.685	ng	95
28) cis-1,2-Dichloroethene	11.15	61	1843	0.076	ng	93
29) Diisopropyl Ether	11.44	87	307	N.D.		
30) Ethyl Acetate	11.44	61	19575	3.232	ng	98
31) n-Hexane	11.41	57	22179	0.807	ng	97
32) Chloroform	11.48	83	8307	0.266	ng	100
34) Tetrahydrofuran (THF)	11.92	72	2769	0.231	ng	97
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	2536	0.119	ng	93
38) 1,1,1-Trichloroethane	12.57	97	1212	N.D.		
39) Isopropyl Acetate	13.01	61	170	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	59171	0.734	ng	100
42) Carbon Tetrachloride	13.20	117	7742	0.303	ng	97
43) Cyclohexane	13.32	84	7331	0.257	ng	95
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.89	63	140	N.D.		
46) Bromodichloromethane	14.09	83	1073	N.D.		
47) Trichloroethene	14.13	130	73126	3.086	ng	99
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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Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 13:49:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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.	d	
51) n-Heptane	14.45	71	13011	0.761	ng	100
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	4610	0.304	ng	# 66
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	397966	5.181	ng	98
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	16.84	43	10582	0.301	ng	88
63) n-Octane	16.95	57	4963	0.350	ng	95
64) Tetrachloroethene	17.11	166	13349	0.510	ng	97
65) Chlorobenzene	17.78	112	1948	N.D.		
66) Ethylbenzene	18.11	91	81418	0.903	ng	98
67) m- & p-Xylenes	18.26	91	194320	2.913	ng	98
68) Bromoform	18.34	173	657	N.D.		
69) Styrene	18.59	104	7734	0.142	ng	99
70) o-Xylene	18.69	91	69273	1.023	ng	97
71) n-Nonane	18.86	43	50806	1.645	ng	98
72) 1,1,2,2-Tetrachloroethane	18.68	83	578	N.D.		
74) Cumene	19.20	105	10254	0.113	ng	95
75) alpha-Pinene	19.54	93	90310	1.986	ng	75
76) n-Propylbenzene	19.64	91	31531	0.312	ng	98
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.76	105	37177	0.450	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	34073	0.476	ng	95
80) alpha-Methylstyrene	19.97	118	800	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	109035	1.526	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	607	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	657	N.D.		
86) 1,4-Dichlorobenzene	20.38	146	98451	2.017	ng	98
87) sec-Butylbenzene	20.42	105	3565	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	20.68	146	709	N.D.		
91) d-Limonene	20.68	68	30157	1.194	ng	89
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	22.17	180	1068	N.D.		
95) Naphthalene	22.28	128	98500	0.911	ng	100
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	0.00	91	0	N.D.	d	

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

Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 13:49:38 2019

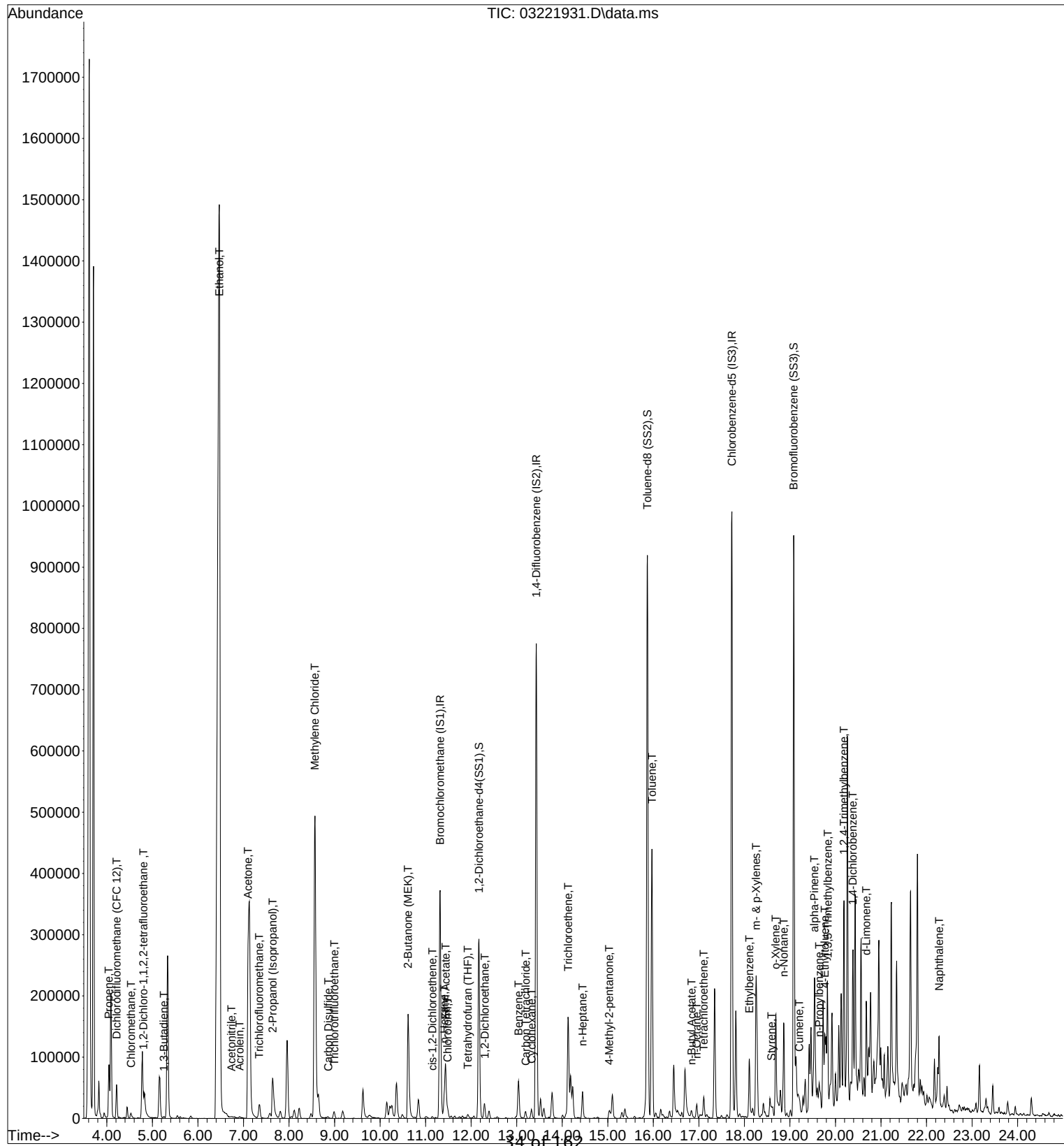
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 10:55:50 2019

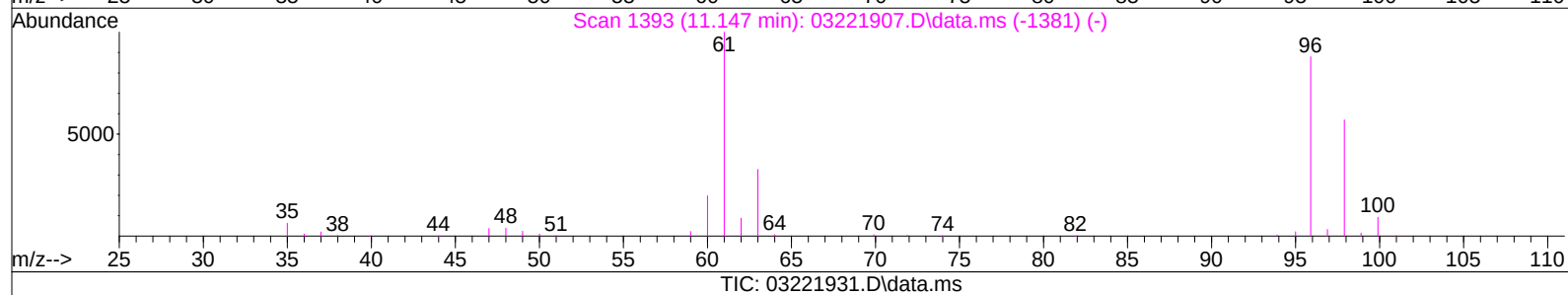
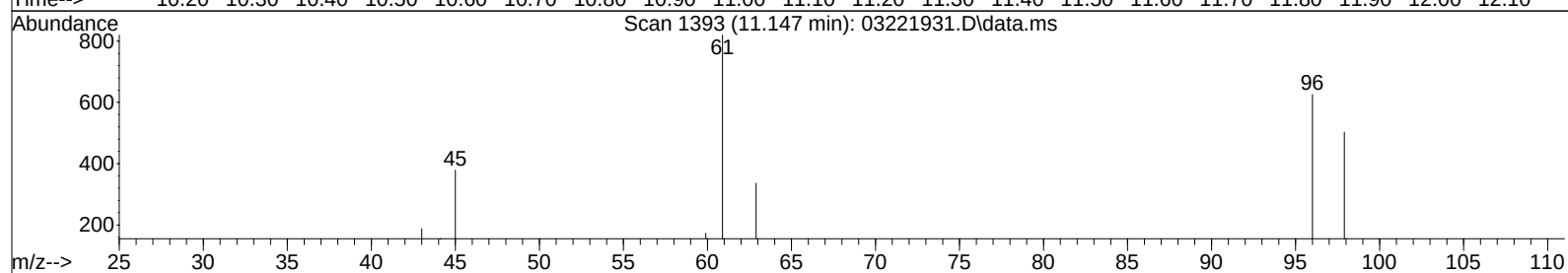
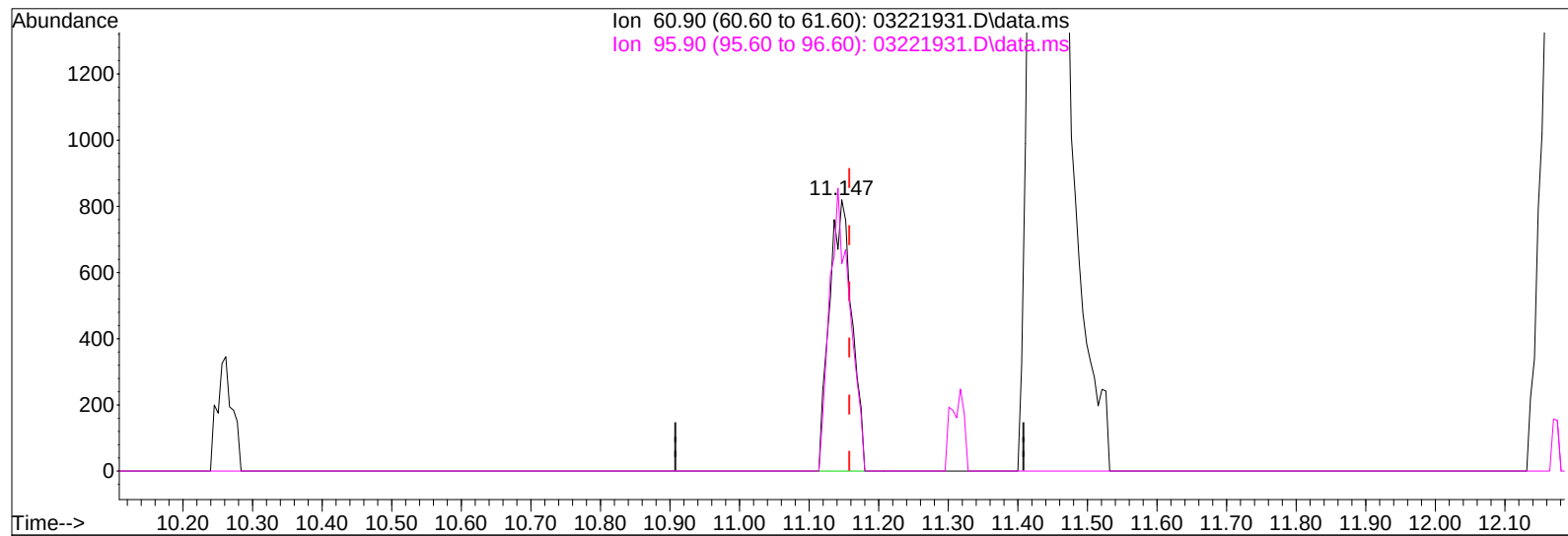
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Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



(28) cis-1,2-Dichloroethene (T)

11.147min (-0.011) 0.08ng

response 1843

Ion	Exp%	Act%
60.90	100	100
95.90	88.00	94.19
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 10:55:50 2019

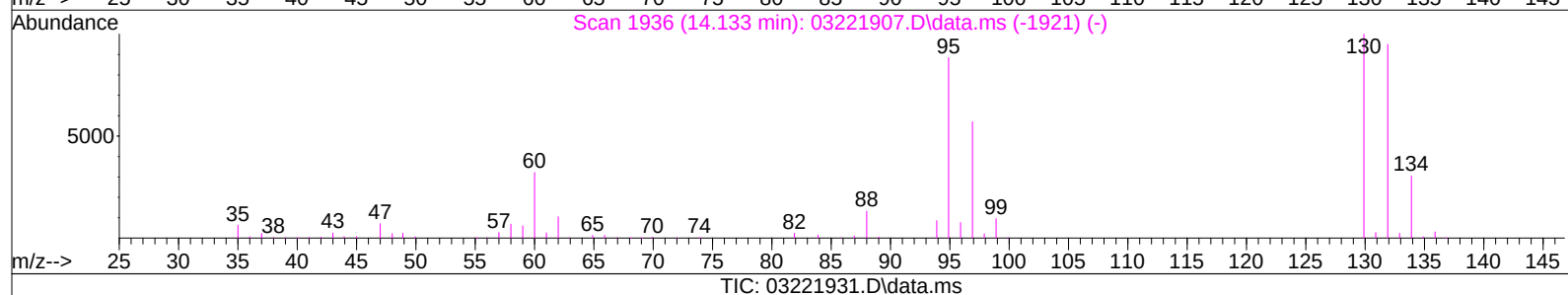
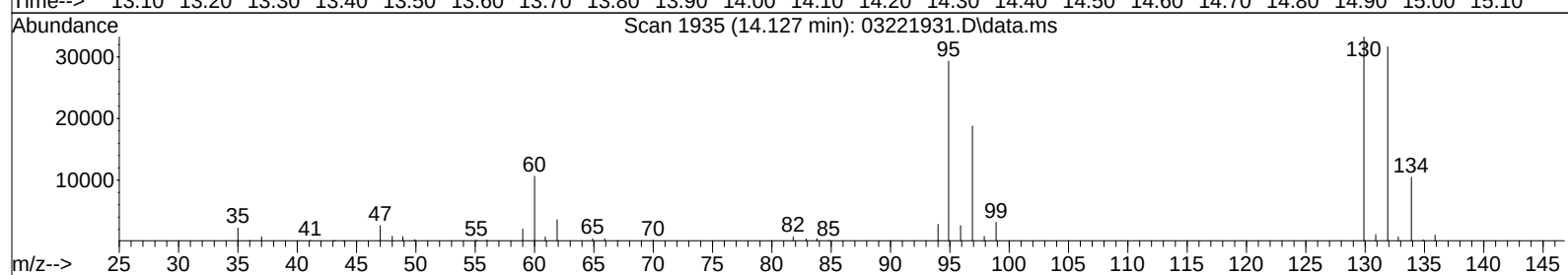
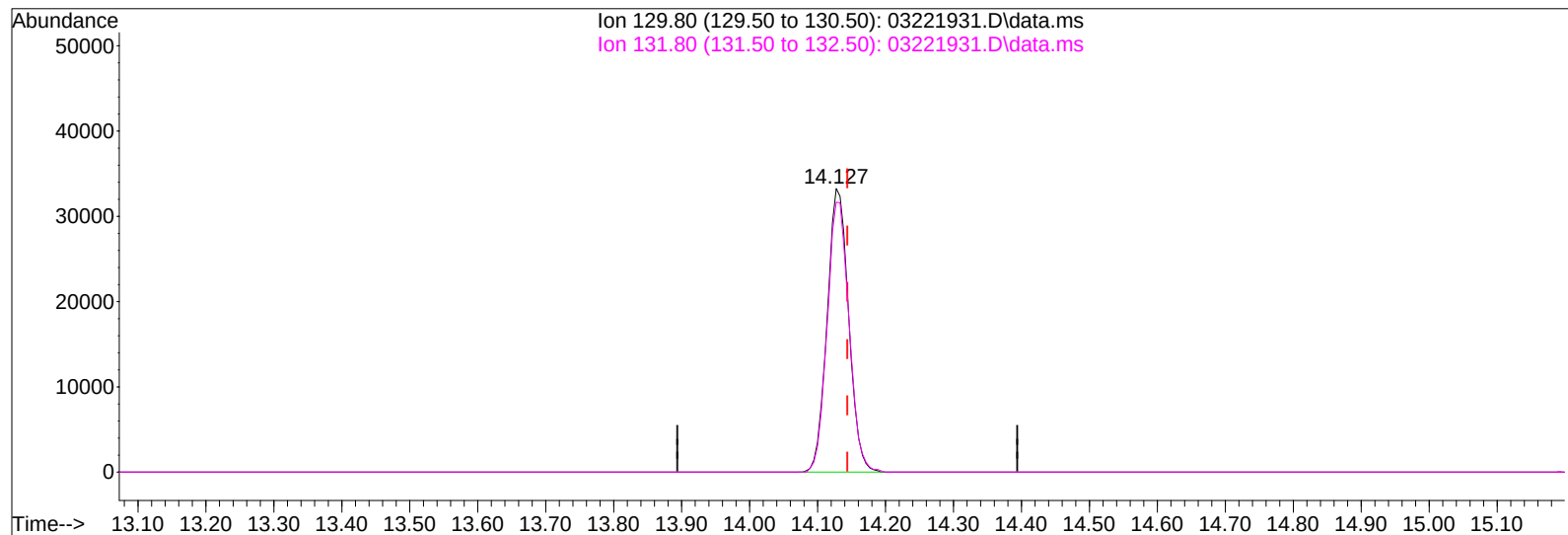
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221931.D\data.ms

(47) Trichloroethene (T)

14.127min (-0.017) 3.09ng

response 73126

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	96.87
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221931.D

Acq On : 22 Mar 2019 20:38

Operator: LH

Sample : P1901513-003 (1000mL)

Misc : S31-02111911

ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 25 10:55:50 2019

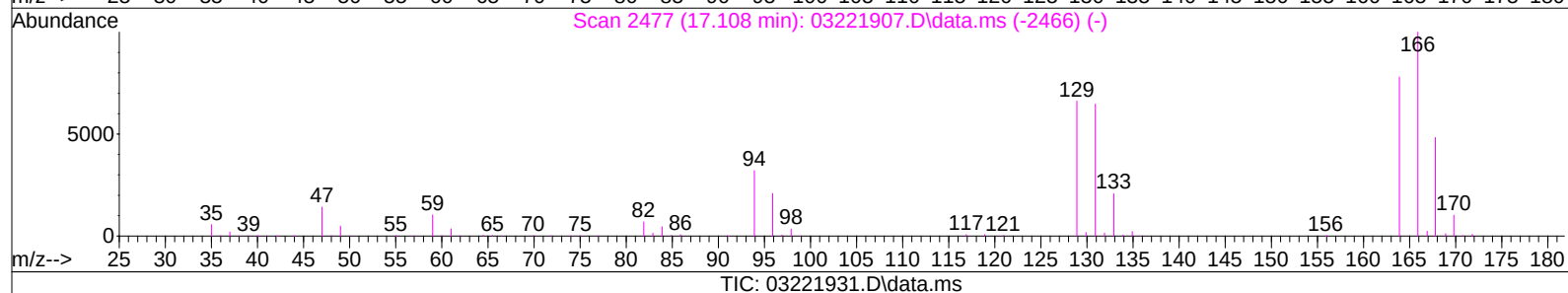
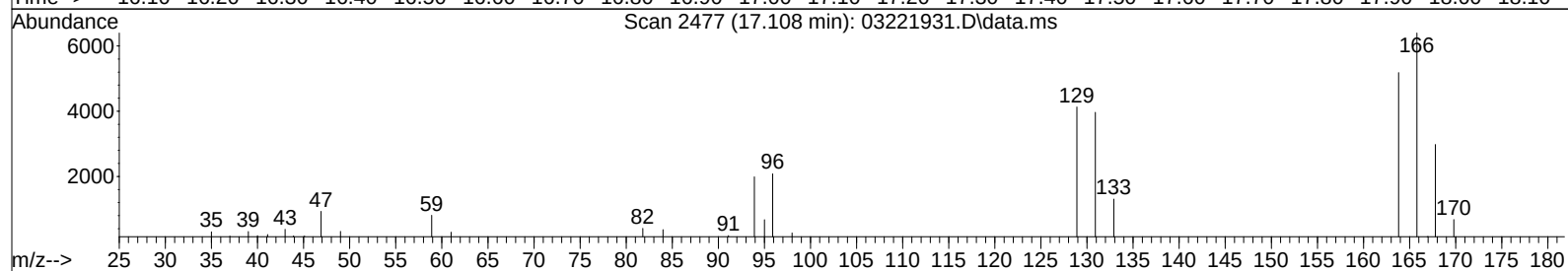
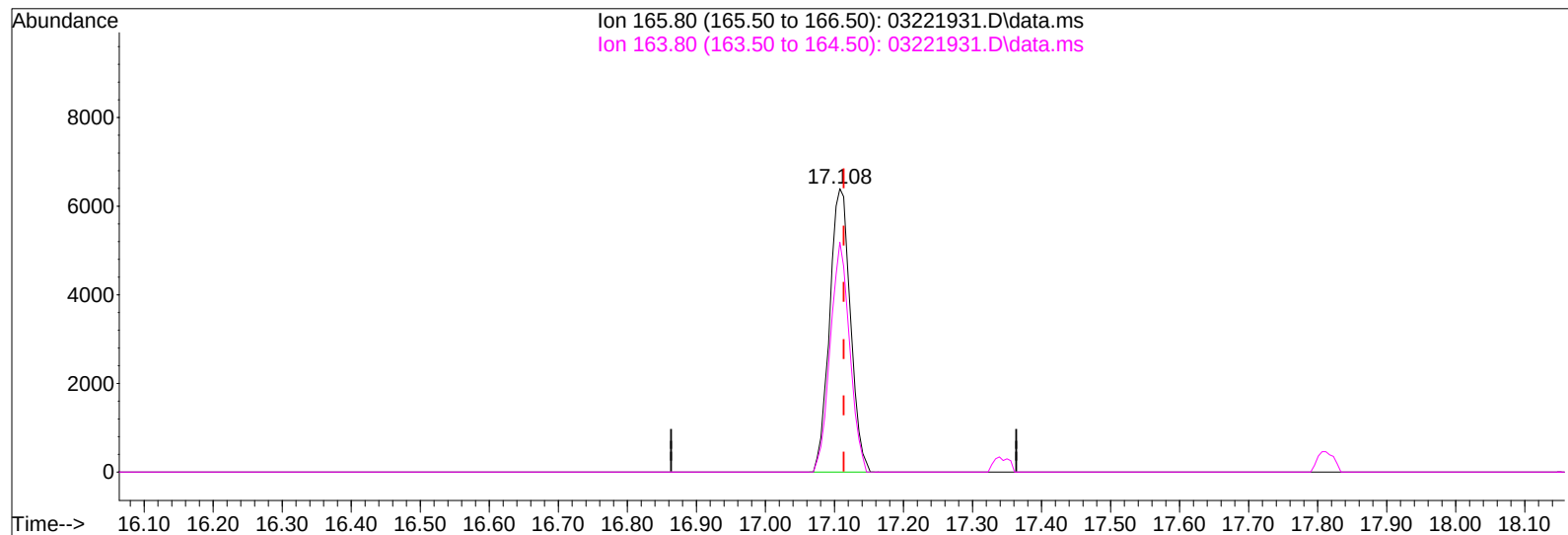
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221931.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.006) 0.51ng

response 13349

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	75.74
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-3

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-004

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC00071

Initial Pressure (psig): -1.51 Final Pressure (psig): 3.78

Container Dilution Factor: 1.40

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.14	0.15	0.11	0.034	0.039	0.026	J
79-01-6	Trichloroethene	4.3	0.15	0.10	0.80	0.029	0.019	
127-18-4	Tetrachloroethene	0.92	0.15	0.097	0.14	0.023	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.

Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 13:51:56 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/25/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	198694	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	838679	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	336793	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	240748	12.645	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%
57) Toluene-d8 (SS2)	15.87	98	790993	12.838	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.72%
73) Bromofluorobenzene (SS3)	19.09	174	342618	13.147	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.20%

Target Compounds

						Qvalue
2) Propene	4.04	42	21241	1.206	ng	96
3) Dichlorodifluoromethan...	4.21	85	59143	1.727	ng	100
4) Chloromethane	4.53	50	5425	0.202	ng	92
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	1822	0.082	ng	96
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.24	54	2341	0.129	ng	# 86
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.41	45	245804	21.284	ng	99
11) Acetonitrile	6.74	41	2365	0.081	ng	# 62
12) Acrolein	6.91	56	5299	0.545	ng	88
13) Acetone	7.09	58	281910	22.099	ng	# 42
14) Trichlorofluoromethane	7.35	101	30147	0.990	ng	99
15) 2-Propanol (Isopropanol)	7.64	45	30338	0.803	ng	79
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	8.57	84	319465	17.245	ng	95
20) 3-Chloro-1-propene (Al...	8.73	41	184	N.D.		
21) Trichlorotrifluoroethane	8.98	151	7047	0.364	ng	98
22) Carbon Disulfide	8.85	76	9438	0.143	ng	93
23) trans-1,2-Dichloroethene	9.86	61	939	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	10.24	73	1179	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	83360	7.095	ng	94
28) cis-1,2-Dichloroethene	11.14	61	2297	0.097	ng	96
29) Diisopropyl Ether	11.42	87	691	N.D.		
30) Ethyl Acetate	11.44	61	22662	3.796	ng	99
31) n-Hexane	11.41	57	52835	1.949	ng	96
32) Chloroform	11.48	83	10123	0.329	ng	98
34) Tetrahydrofuran (THF)	11.91	72	8438	0.714	ng	91
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	2442	0.116	ng	93
38) 1,1,1-Trichloroethane	12.55	97	814	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	107669	1.352	ng	100
42) Carbon Tetrachloride	13.20	117	8378	0.332	ng	99
43) Cyclohexane	13.32	84	14805	0.525	ng	97
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.89	63	269	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.13	130	71637	3.061	ng	98
48) 1,4-Dioxane	14.15	88	113	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 13:51:56 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	1475	0.204	ng	# 50
51) n-Heptane	14.45	71	18408	1.090	ng	100
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	3268	0.218	ng	81
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	688069	9.245	ng	99
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	16.84	43	10556	0.310	ng	92
63) n-Octane	16.95	57	7481	0.544	ng	91
64) Tetrachloroethene	17.11	166	16604	0.654	ng	100
65) Chlorobenzene	17.78	112	2513	N.D.		
66) Ethylbenzene	18.11	91	120849	1.384	ng	99
67) m- & p-Xylenes	18.26	91	303784	4.699	ng	98
68) Bromoform	18.34	173	530	N.D.		
69) Styrene	18.60	104	8416	0.159	ng	97
70) o-Xylene	18.69	91	109639	1.672	ng	98
71) n-Nonane	18.87	43	39304	1.314	ng	99
72) 1,1,2,2-Tetrachloroethane	18.69	83	546	N.D.		
74) Cumene	19.20	105	12163	0.139	ng	98
75) alpha-Pinene	19.54	93	239330	5.433	ng	90
76) n-Propylbenzene	19.64	91	39074	0.399	ng	98
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.77	105	46744	0.584	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	43062	0.621	ng	97
80) alpha-Methylstyrene	19.97	118	493	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	136440	1.971	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.27	91	210	N.D.		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
86) 1,4-Dichlorobenzene	20.38	146	534897	11.312	ng	100
87) sec-Butylbenzene	20.42	105	4300	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	20.68	146	869	N.D.		
91) d-Limonene	20.68	68	20520	0.838	ng	96
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	22.17	180	788	N.D.		
95) Naphthalene	22.28	128	60439	0.577	ng	99
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	0.00	91	0	N.D.	d	

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

Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 13:51:56 2019

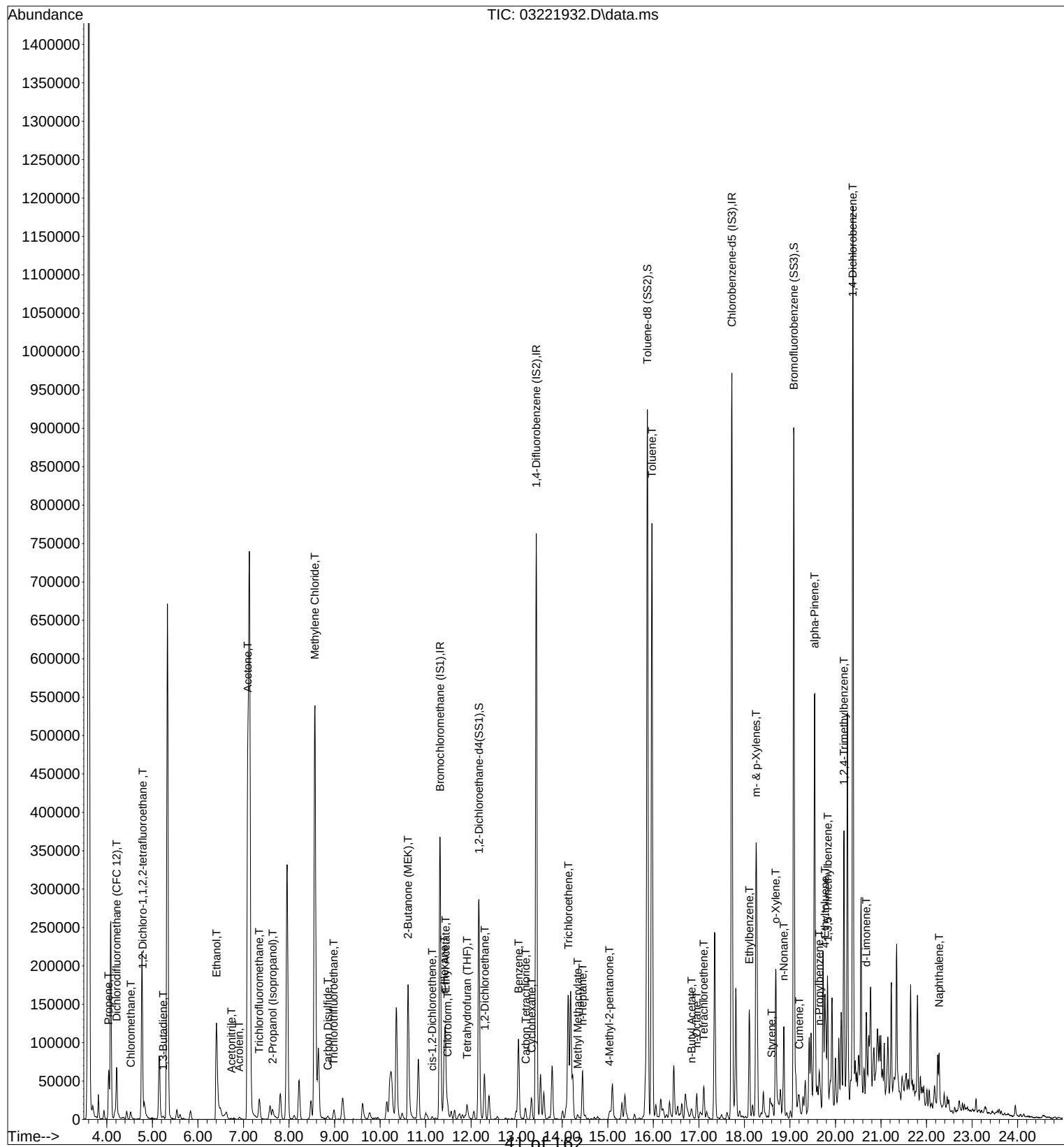
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



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Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 10:55:53 2019

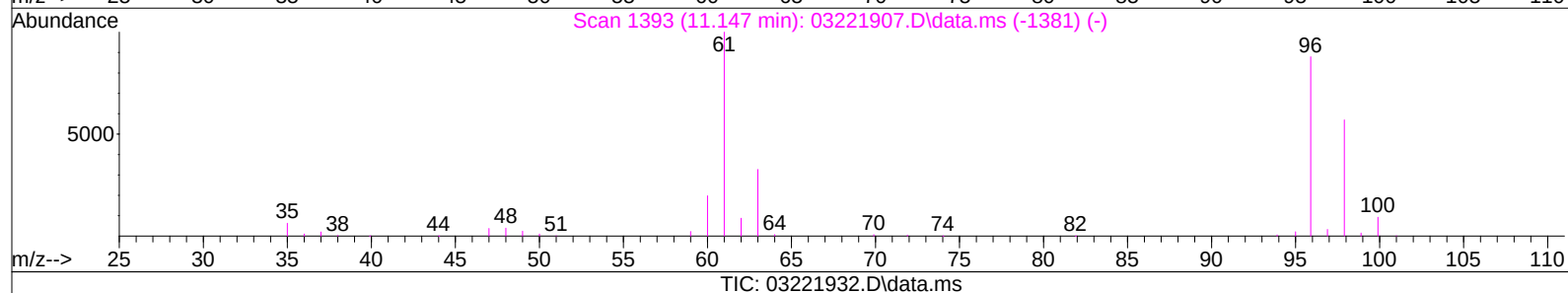
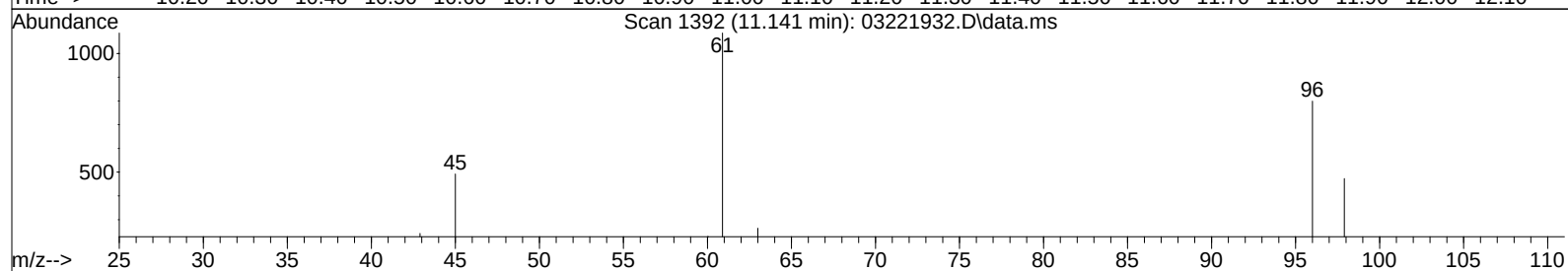
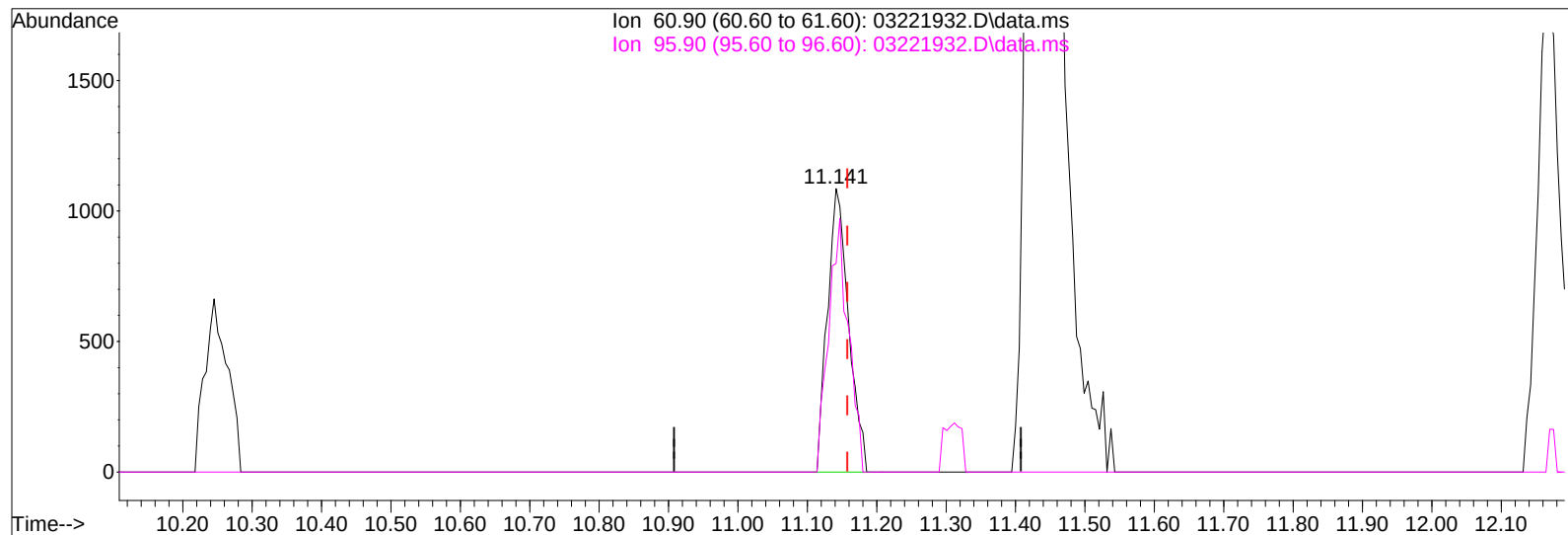
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



(28) cis-1,2-Dichloroethene (T)

11.141min (-0.017) 0.10ng

response 2297

Ion	Exp%	Act%
60.90	100	100
95.90	88.00	84.02
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 10:55:53 2019

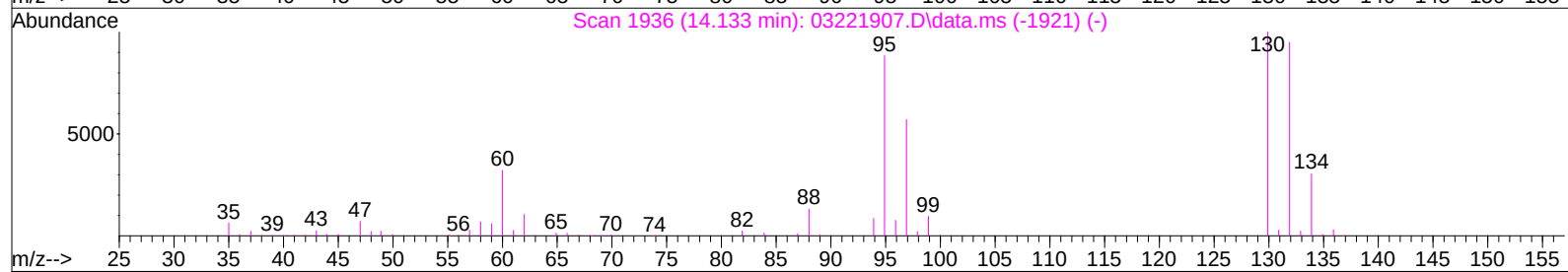
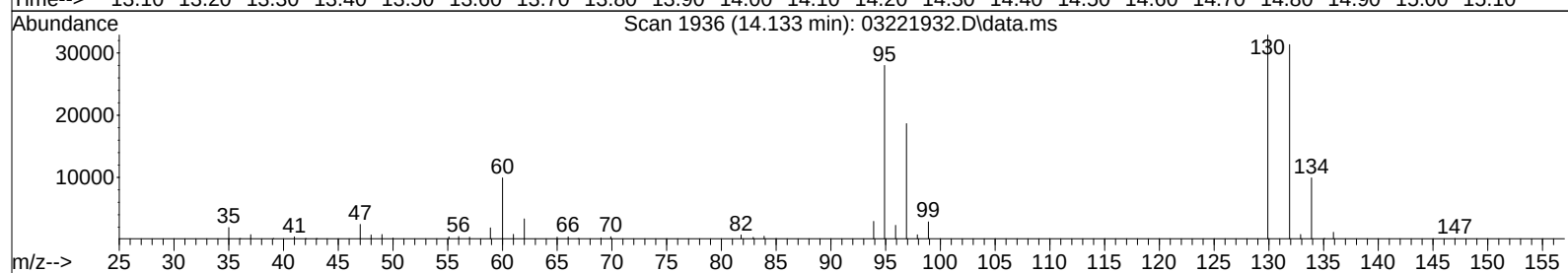
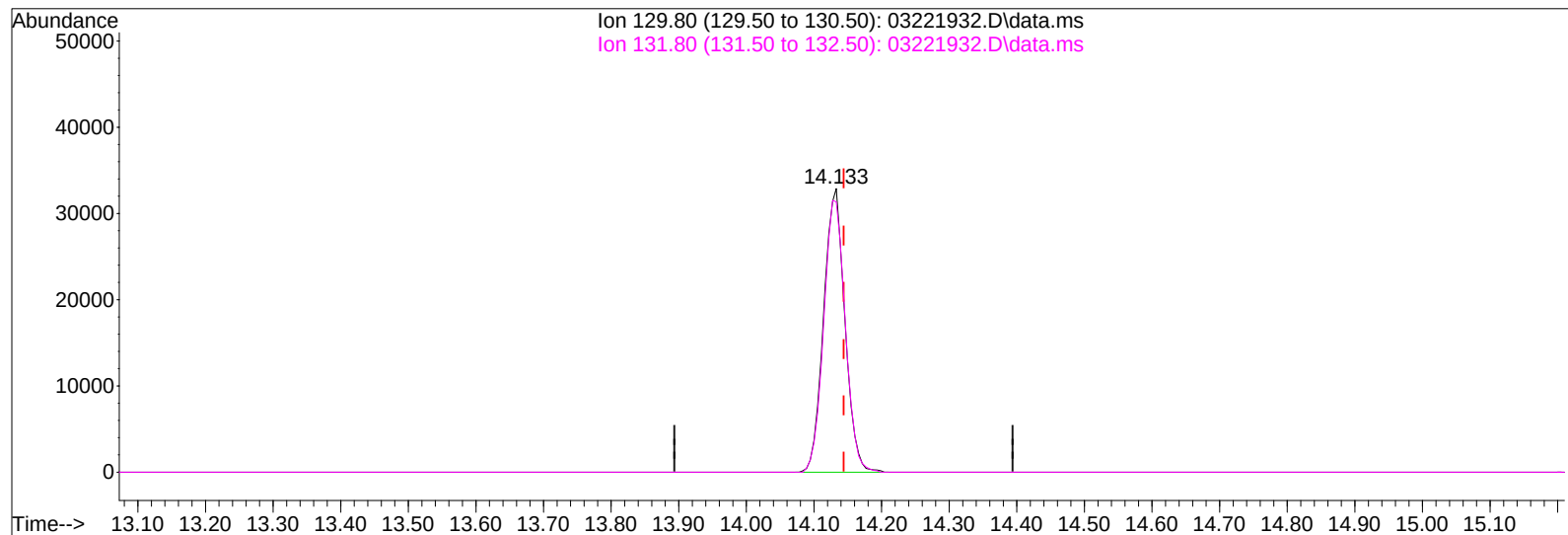
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221932.D\data.ms

(47) Trichloroethene (T)

14.133min (-0.011) 3.06ng

response 71637

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	97.83
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221932.D

Acq On : 22 Mar 2019 21:12

Operator: LH

Sample : P1901513-004 (1000mL)

Misc : S31-02111911

ALS Vial : 9 Sample Multiplier: 1

Quant Time: Mar 25 10:55:53 2019

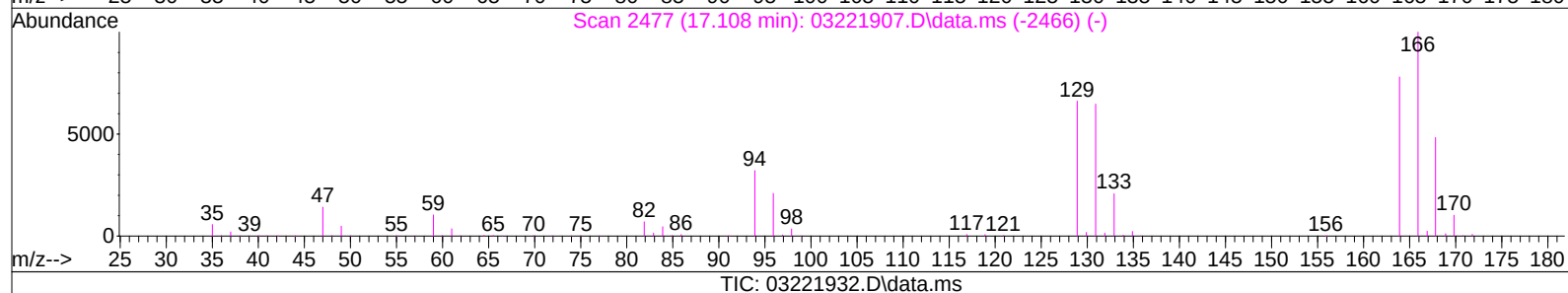
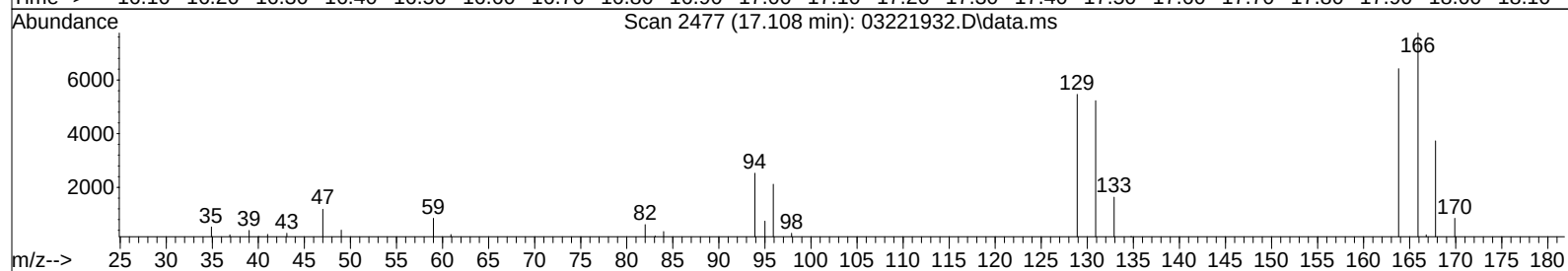
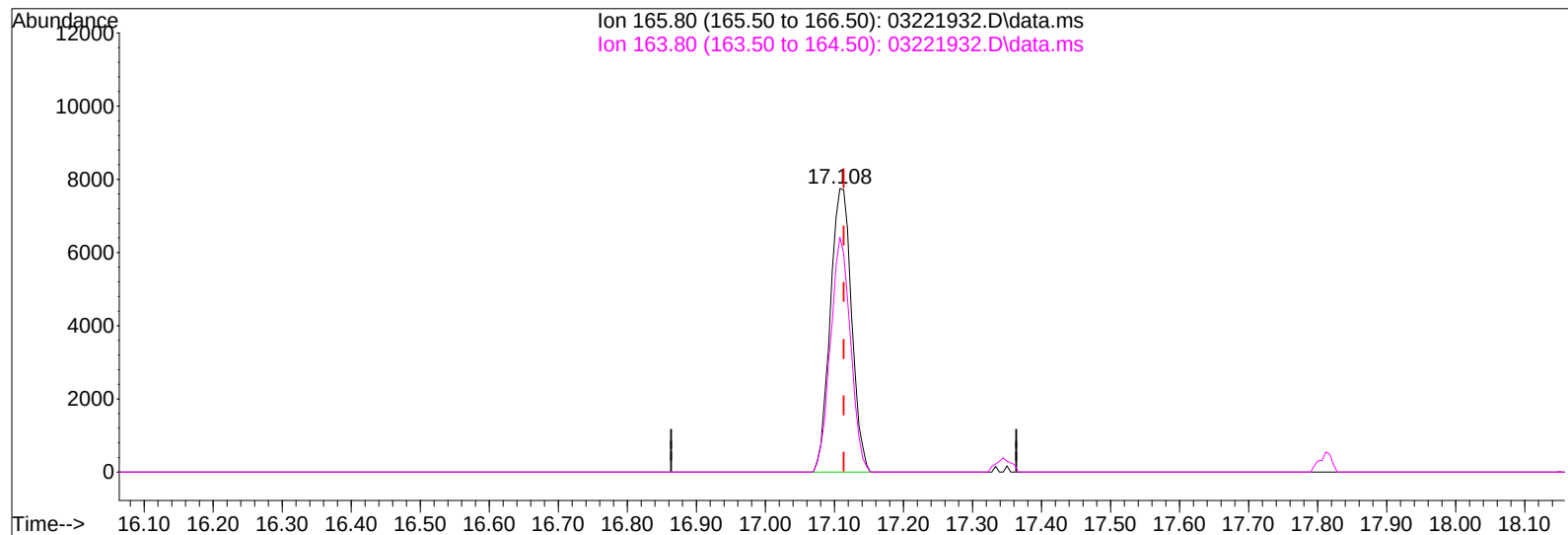
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221932.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.006) 0.65ng

response 16604

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	77.76
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-4

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-005

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: AC02395

Initial Pressure (psig): -2.62 Final Pressure (psig): 3.77

Container Dilution Factor: 1.53

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	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	
79-01-6	Trichloroethene	0.81	0.17	0.11	0.15	0.031	0.021	
127-18-4	Tetrachloroethene	0.81	0.17	0.11	0.12	0.025	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.

Data File: I:\MS16\DATA\2019 03\22\03221934.D

Acq On : 22 Mar 2019 22:19

Operator: LH

Sample : P1901513-005 (1000mL)

Misc : S31-02111911

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 25 13:56:41 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/25/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	265738	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	847418	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	349406	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	244364	9.597	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	76.80%
57) Toluene-d8 (SS2)	15.87	98	811474	12.695	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.60%
73) Bromofluorobenzene (SS3)	19.08	174	352118	13.024	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.16%

Target Compounds

						Qvalue
2) Propene	4.03	42	112156	4.761	ng	99
3) Dichlorodifluoromethan...	4.21	85	59288	1.294	ng	100
4) Chloromethane	4.52	50	6008	0.167	ng	89
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1783	0.060	ng	85
6) Vinyl Chloride	4.96	62	176	N.D.		
7) 1,3-Butadiene	5.25	54	3694	0.152	ng	# 35
8) Bromomethane	5.70	94	795	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.42	45	617042	39.949	ng	99
11) Acetonitrile	6.73	41	10625	0.273	ng	93
12) Acrolein	6.92	56	4791	0.369	ng	93
13) Acetone	7.10	58	819147	48.013	ng	# 1
14) Trichlorofluoromethane	7.36	101	25695	0.631	ng	98
15) 2-Propanol (Isopropanol)	7.61	45	458491	9.070	ng	97
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	8.60	84	49812	2.011	ng	100
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.99	151	6653	0.257	ng	95
22) Carbon Disulfide	8.86	76	375252	4.254	ng	100
23) trans-1,2-Dichloroethene	9.87	61	711	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.	d	
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.	d	
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	289682	18.434	ng	93
28) cis-1,2-Dichloroethene	11.16	61	1121	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.	d	
30) Ethyl Acetate	11.44	61	33005	4.134	ng	# 76
31) n-Hexane	11.41	57	770842	21.266	ng	98
32) Chloroform	11.49	83	5662	0.137	ng	80
34) Tetrahydrofuran (THF)	11.92	72	3290	0.208	ng	94
35) Ethyl tert-Butyl Ether	12.04	87	476	N.D.		
36) 1,2-Dichloroethane	0.00	62	0	N.D.	d	
38) 1,1,1-Trichloroethane	12.57	97	844	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.	d	
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	525423	6.529	ng	98
42) Carbon Tetrachloride	13.20	117	8569	0.336	ng	98
43) Cyclohexane	13.33	84	204736	7.187	ng	98
44) tert-Amyl Methyl Ether	13.68	73	1199	N.D.		
45) 1,2-Dichloropropane	13.89	63	389	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.13	130	12502	0.529	ng	98
48) 1,4-Dioxane	14.14	88	630	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2019 03\22\03221934.D

Acq On : 22 Mar 2019 22:19

Operator: LH

Sample : P1901513-005 (1000mL)

Misc : S31-02111911

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 25 13:56:41 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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.	d	
51) n-Heptane	14.45	71	371206	21.754	ng	99
52) cis-1,3-Dichloropropene	15.00	75	605	N.D.		
53) 4-Methyl-2-pentanone	15.02	58	57564	3.802	ng	96
54) trans-1,3-Dichloropropene	15.53	75	764	N.D.		
55) 1,1,2-Trichloroethane	15.69	97	386	N.D.		
58) Toluene	15.98	91	14600777	189.099	ng	99
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	16.40	129	307	N.D.		
61) 1,2-Dibromoethane	16.64	107	859	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D.	d	
63) n-Octane	16.95	57	141458	9.918	ng	98
64) Tetrachloroethene	17.11	166	13968	0.530	ng	100
65) Chlorobenzene	0.00	112	0	N.D.	d	
66) Ethylbenzene	18.11	91	1199799	13.241	ng	100
67) m- & p-Xylenes	18.26	91	3428110	51.114	ng	99
68) Bromoform	18.35	173	730	N.D.		
69) Styrene	18.59	104	10813	0.197	ng	85
70) o-Xylene	18.69	91	1359749	19.983	ng	99
71) n-Nonane	18.87	43	315068	10.150	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	998	N.D.		
74) Cumene	19.20	105	314687	3.460	ng	100
75) alpha-Pinene	19.54	93	92595	2.026	ng	80
76) n-Propylbenzene	19.64	91	1504289	14.811	ng	100
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.77	105	1869079	22.507	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	1606372	22.327	ng	100
80) alpha-Methylstyrene	0.00	118	0	N.D.	d	
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	4847402	67.480	ng	88
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	2608	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	4391	0.092	ng	99
86) 1,4-Dichlorobenzene	20.39	146	9806	0.200	ng	98
87) sec-Butylbenzene	0.00	105	0	N.D.	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	20.68	146	4316	0.095	ng	98
91) d-Limonene	20.68	68	17756	0.699	ng	86
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	d	
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	22.17	180	6569	0.176	ng	97
95) Naphthalene	22.28	128	140201	1.289	ng	96
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.59	225	780	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.	d	

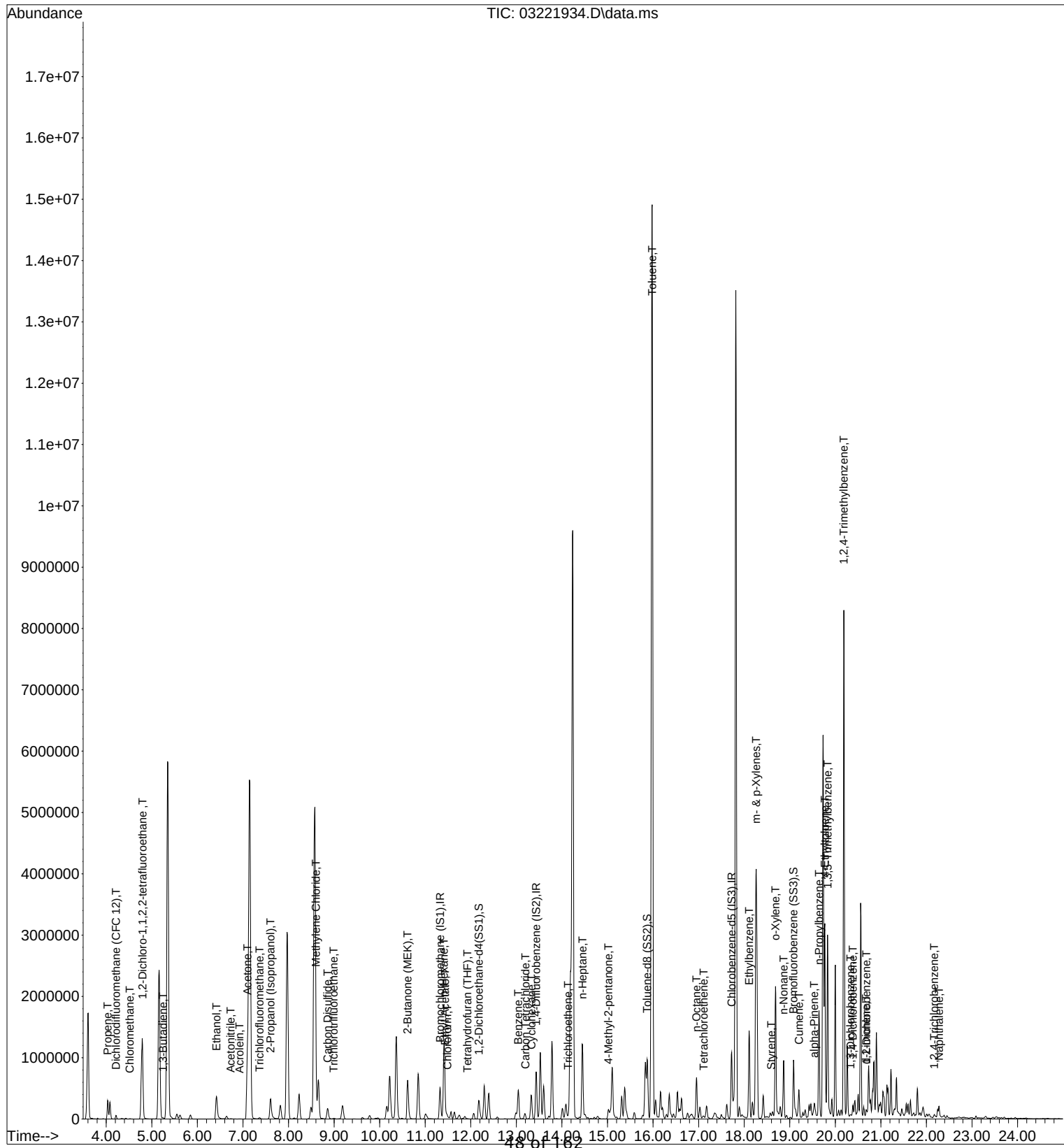
(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS16\DATA\2019 03\22\03221934.D

Acq On : 22 Mar 2019 22:19
Sample : P1901513-005 (1000mL)
Misc : S31-02111911
ALS Vial : 10 Sample Multiplier: 1

Operator: LH

Quant Time: Mar 25 13:56:41 2019
Quant Method : I:\MS16\METHODS\R16032219.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 22 11:09:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221934.D

Acq On : 22 Mar 2019 22:19

Operator: LH

Sample : P1901513-005 (1000mL)

Misc : S31-02111911

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 25 10:55:59 2019

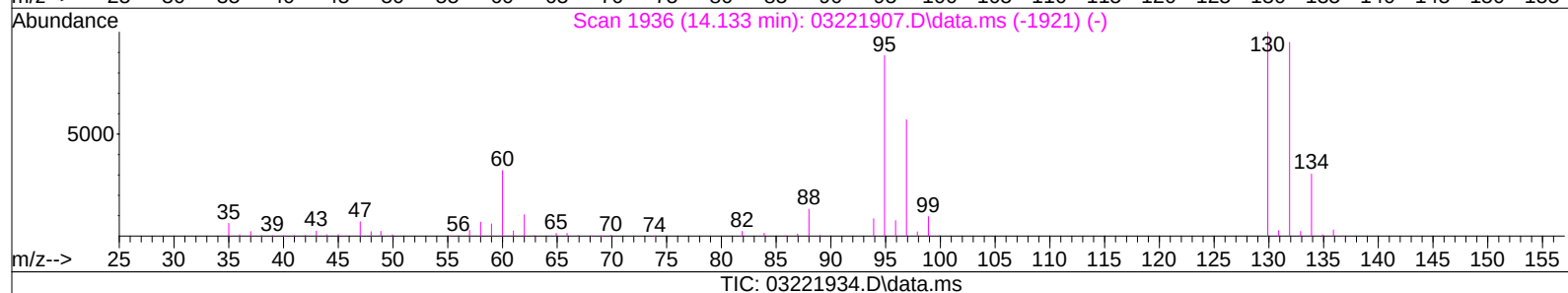
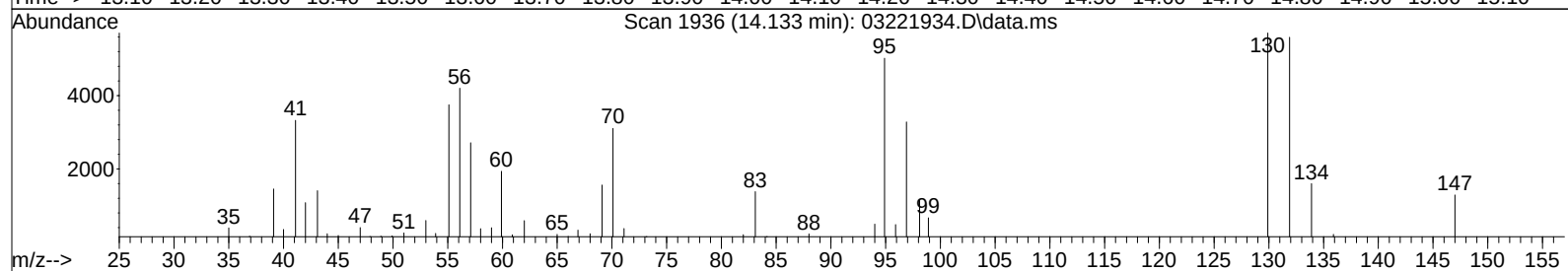
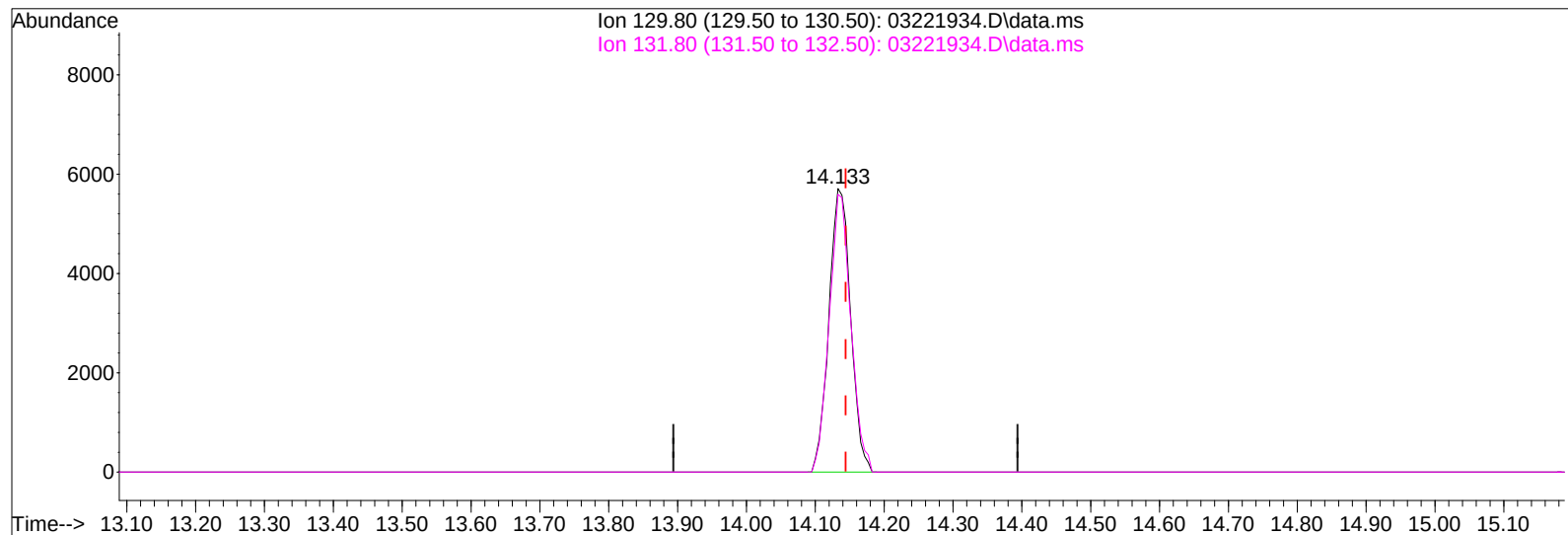
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221934.D\data.ms

(47) Trichloroethene (T)

14.133min (-0.011) 0.53ng

response 12502

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	97.91
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221934.D

Acq On : 22 Mar 2019 22:19

Operator: LH

Sample : P1901513-005 (1000mL)

Misc : S31-02111911

ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 25 10:55:59 2019

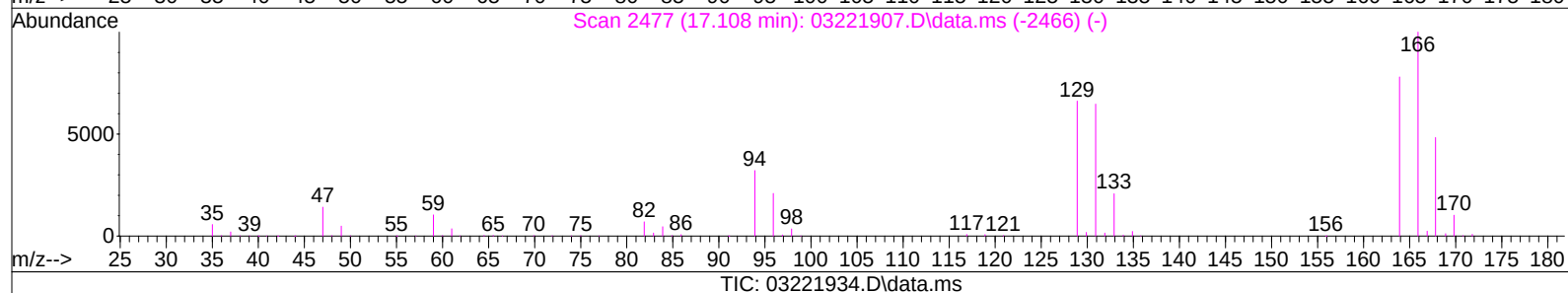
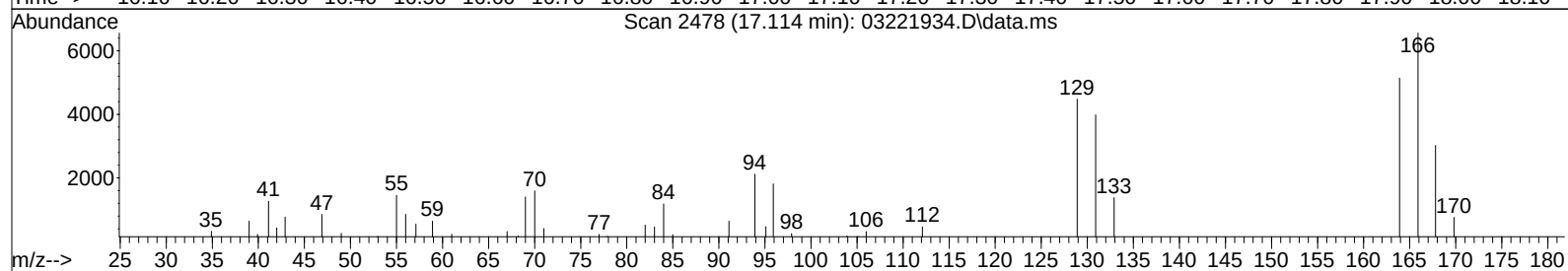
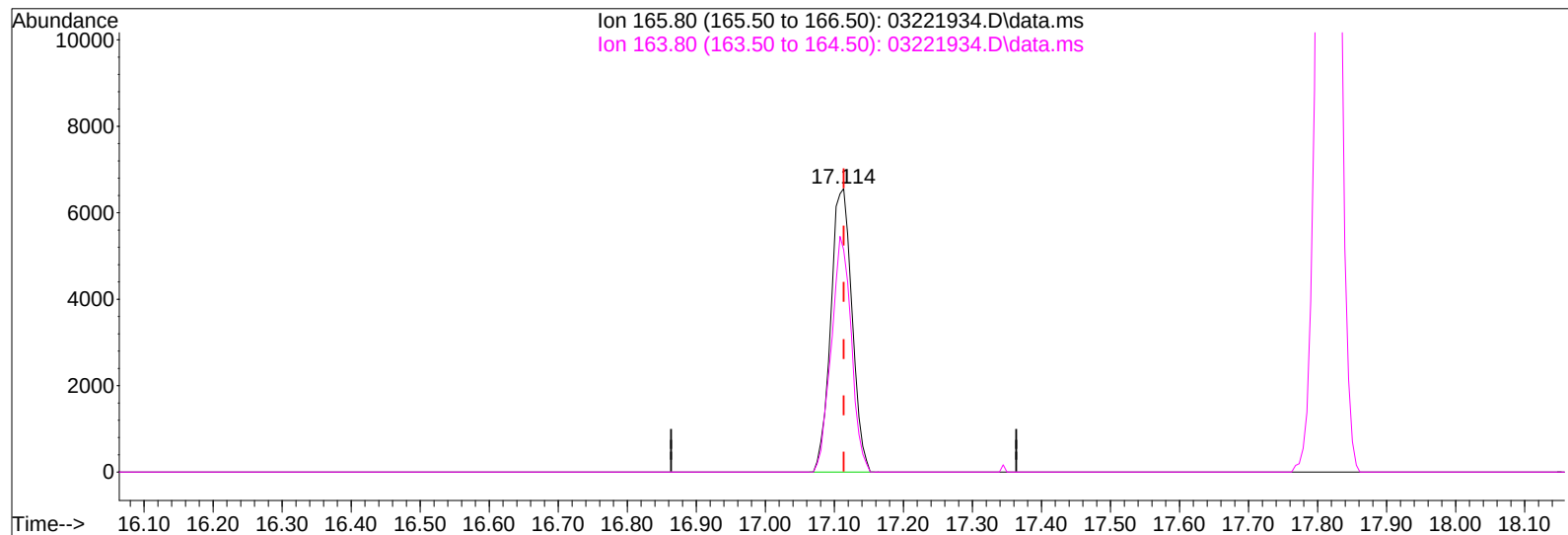
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221934.D\data.ms

(64) Tetrachloroethene (T)

17.114min (+0.000) 0.53ng

response 13968

Ion	Exp%	Act%

165.80	100	100

163.80	78.00	78.34

0.00	0.00	0.00

0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-5

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901513

ALS Sample ID: P1901513-006

Test Code: EPA TO-15

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

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: SSC00054

Date Collected: 3/19/19

Date Received: 3/22/19

Date Analyzed: 3/22/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.61 Final Pressure (psig): 3.85

Container Dilution Factor: 1.42

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.16	0.16	0.11	0.041	0.039	0.027	
79-01-6	Trichloroethene	4.5	0.16	0.10	0.83	0.029	0.019	
127-18-4	Tetrachloroethene	1.2	0.16	0.098	0.18	0.023	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.

Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	213064	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	896281	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	351367	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	253546	12.419	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.36%
57) Toluene-d8 (SS2)	15.87	98	840573	13.077	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.64%
73) Bromofluorobenzene (SS3)	19.09	174	364960	13.424	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	107.36%

Target Compounds

						Qvalue
2) Propene	4.05	42	30132	1.595	ng	95
3) Dichlorodifluoromethan...	4.22	85	60256	1.641	ng	100
4) Chloromethane	4.53	50	6228	0.216	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	1581	0.067	ng	84
6) Vinyl Chloride	4.96	62	176	N.D.		
7) 1,3-Butadiene	5.24	54	1962	0.101	ng	# 81
8) Bromomethane	5.69	94	304	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.41	45	248545	20.070	ng	99
11) Acetonitrile	6.74	41	3371	0.108	ng	# 54
12) Acrolein	6.92	56	5829	0.559	ng	99
13) Acetone	7.10	58	164776	12.046	ng	# 48
14) Trichlorofluoromethane	7.35	101	30619	0.938	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	67416	1.663	ng	92
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	8.57	84	373132	18.784	ng	96
20) 3-Chloro-1-propene (Al...	8.74	41	487	N.D.		
21) Trichlorotrifluoroethane	8.99	151	7314	0.352	ng	100
22) Carbon Disulfide	8.85	76	54762	0.774	ng	99
23) trans-1,2-Dichloroethene	9.87	61	1045	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	10.24	73	1761	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.61	72	105989	8.412	ng	95
28) cis-1,2-Dichloroethene	11.14	61	2905	0.114	ng	100
29) Diisopropyl Ether	11.41	87	420	N.D.		
30) Ethyl Acetate	11.44	61	18052	2.820	ng	96
31) n-Hexane	11.41	57	36840	1.268	ng	96
32) Chloroform	11.49	83	4096	0.124	ng	98
34) Tetrahydrofuran (THF)	11.92	72	3397	0.268	ng	# 73
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.29	62	3561	0.158	ng	98
38) 1,1,1-Trichloroethane	12.55	97	1045	N.D.		
39) Isopropyl Acetate	12.99	61	269	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	79206	0.931	ng	99
42) Carbon Tetrachloride	13.19	117	8660	0.321	ng	98
43) Cyclohexane	13.32	84	12483	0.414	ng	94
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.89	63	288	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.13	130	78416	3.135	ng	99
48) 1,4-Dioxane	14.15	88	321	N.D.		
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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.	d	
51) n-Heptane	14.45	71	19913	1.103	ng	97
52) cis-1,3-Dichloropropene	15.11	75	171	N.D.		
53) 4-Methyl-2-pentanone	15.03	58	7268	0.454	ng	77
54) trans-1,3-Dichloropropene	15.52	75	691	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	850807	10.958	ng	99
59) 2-Hexanone	0.00	43	0	N.D.	d	
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	16.65	107	130	N.D.		
62) n-Butyl Acetate	16.84	43	14720	0.414	ng	84
63) n-Octane	16.95	57	9367	0.653	ng	93
64) Tetrachloroethene	17.11	166	23093	0.872	ng	98
65) Chlorobenzene	17.71	112	669	N.D.		
66) Ethylbenzene	18.11	91	136148	1.494	ng	99
67) m- & p-Xylenes	18.26	91	325502	4.826	ng	99
68) Bromoform	18.34	173	2128	0.100	ng	99
69) Styrene	18.59	104	9481	0.172	ng	90
70) o-Xylene	18.69	91	117068	1.711	ng	100
71) n-Nonane	18.86	43	66907	2.143	ng	98
72) 1,1,2,2-Tetrachloroethane	18.68	83	974	N.D.		
74) Cumene	19.20	105	19301	0.211	ng	84
75) alpha-Pinene	19.54	93	100115	2.178	ng	80
76) n-Propylbenzene	19.64	91	76630	0.750	ng	99
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.76	105	92501	1.108	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	87143	1.204	ng	100
80) alpha-Methylstyrene	19.97	118	1349	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	270211	3.741	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	794	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	1308	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	33151	0.672	ng	100
87) sec-Butylbenzene	0.00	105	0	N.D.	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	20.68	146	1180	N.D.		
91) d-Limonene	20.68	68	19064	0.747	ng	89
92) 1,2-Dibromo-3-Chloropr...	21.06	157	186	N.D.		
93) n-Undecane	0.00	57	0	N.D.	d	
94) 1,2,4-Trichlorobenzene	22.17	180	2042	0.054	ng	95
95) Naphthalene	22.28	128	234257	2.142	ng	100
96) n-Dodecane	0.00	57	0	N.D.	d	
97) Hexachlorobutadiene	22.59	225	111	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.	d	
99) tert-Butylbenzene	0.00	119	0	N.D.	d	
100) n-Butylbenzene	0.00	91	0	N.D.	d	

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

Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

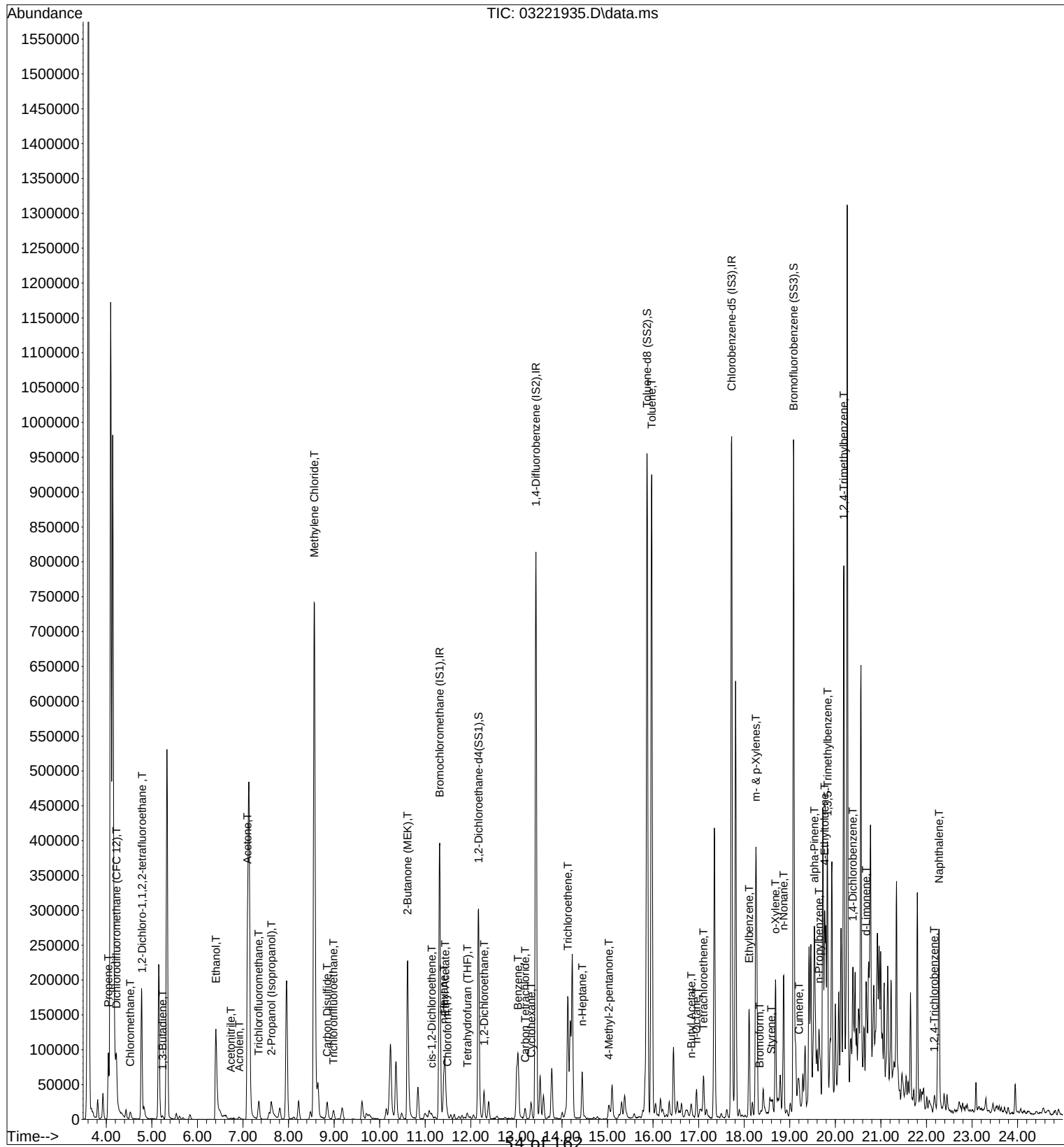
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

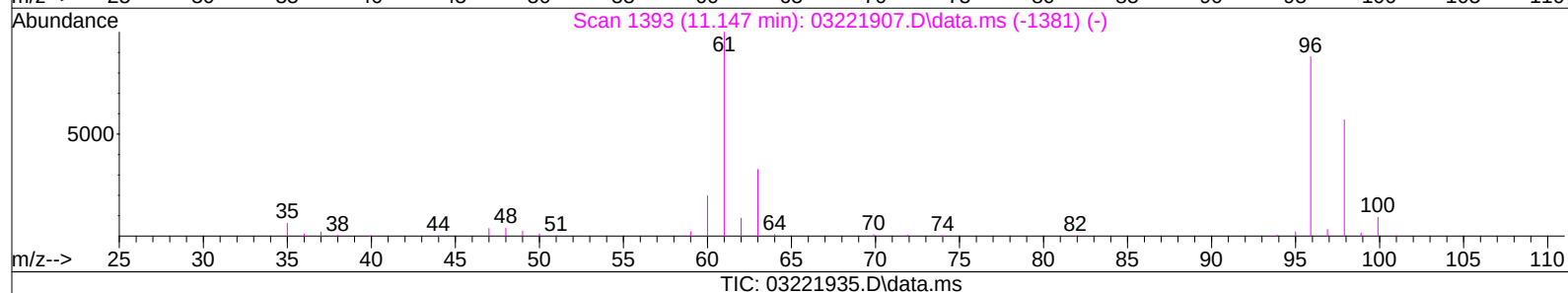
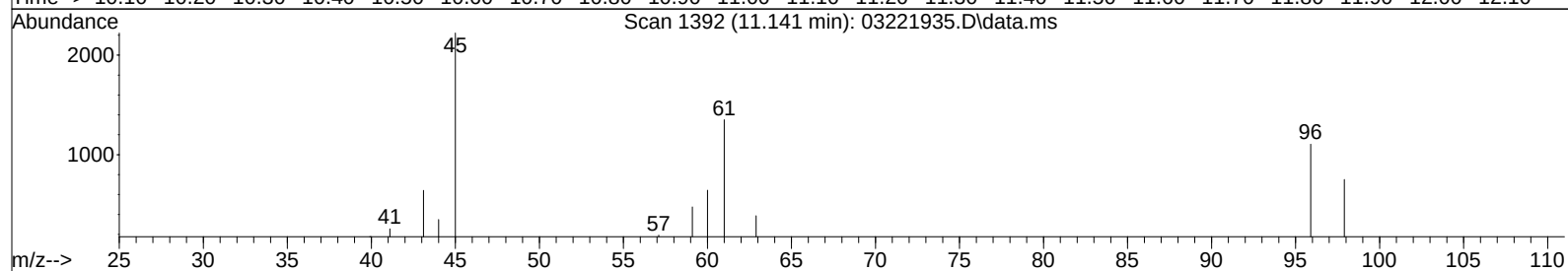
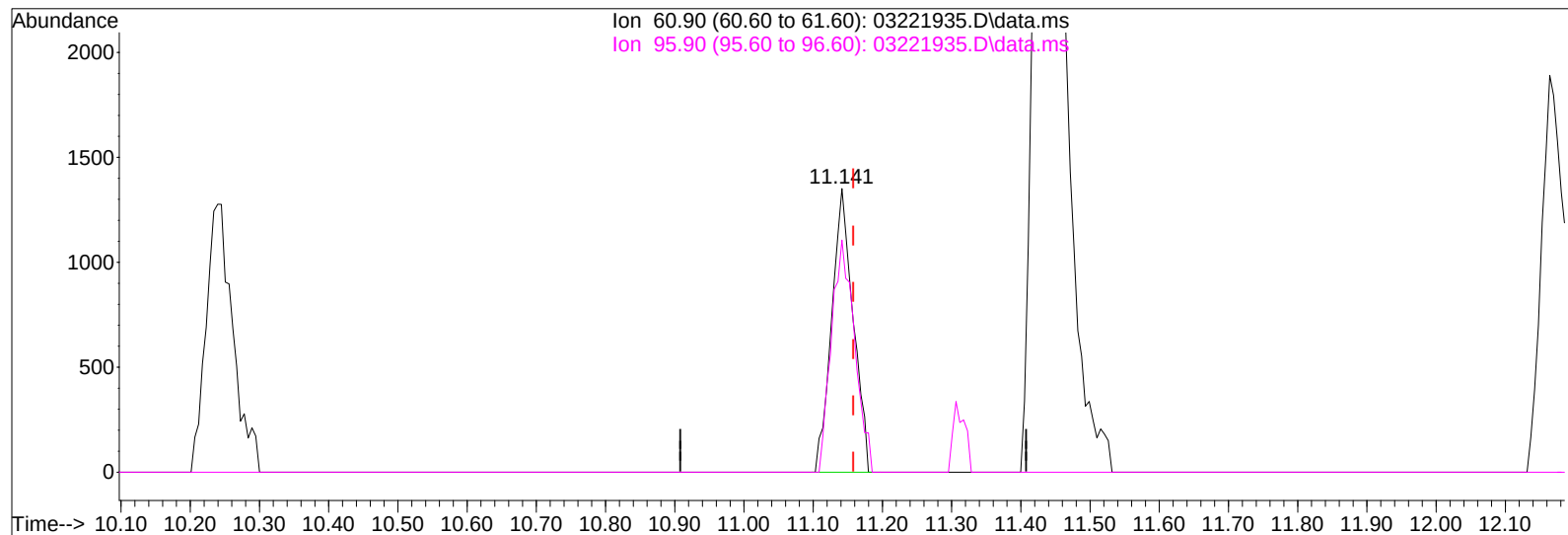
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



(28) cis-1,2-Dichloroethene (T)

11.141min (-0.017) 0.11ng

response 2905

Ion	Exp%	Act%
60.90	100	100
95.90	88.00	88.23
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

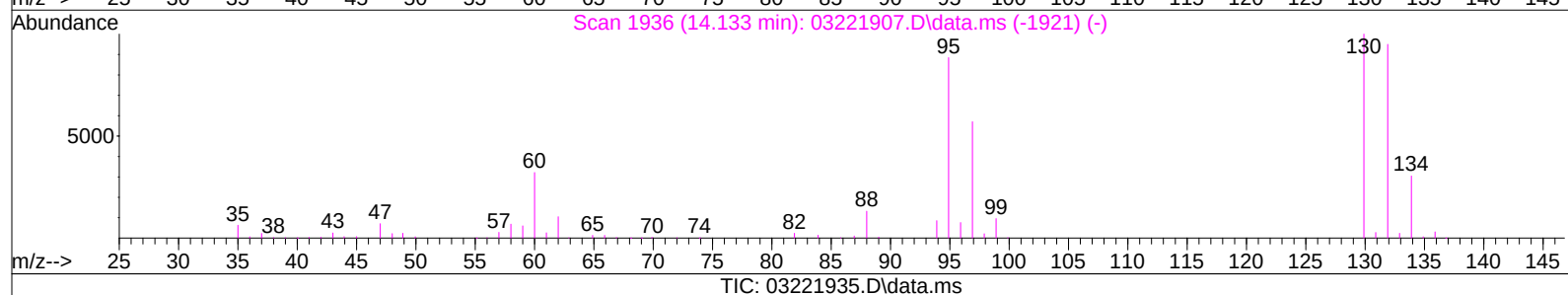
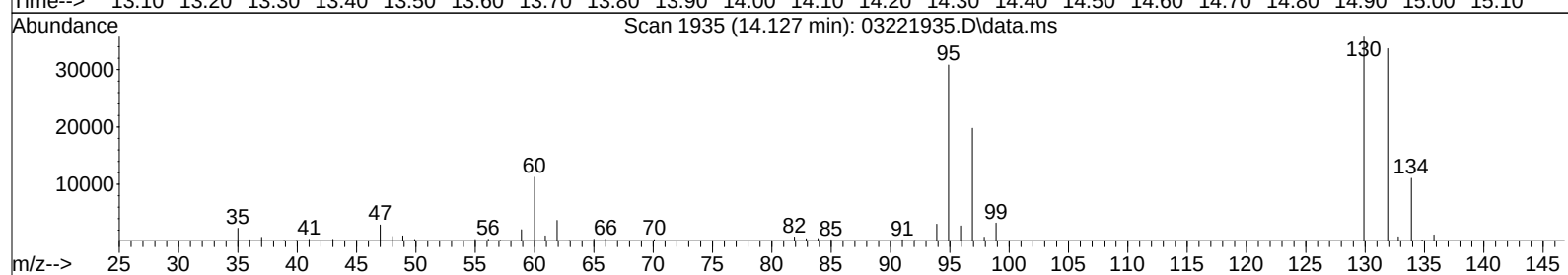
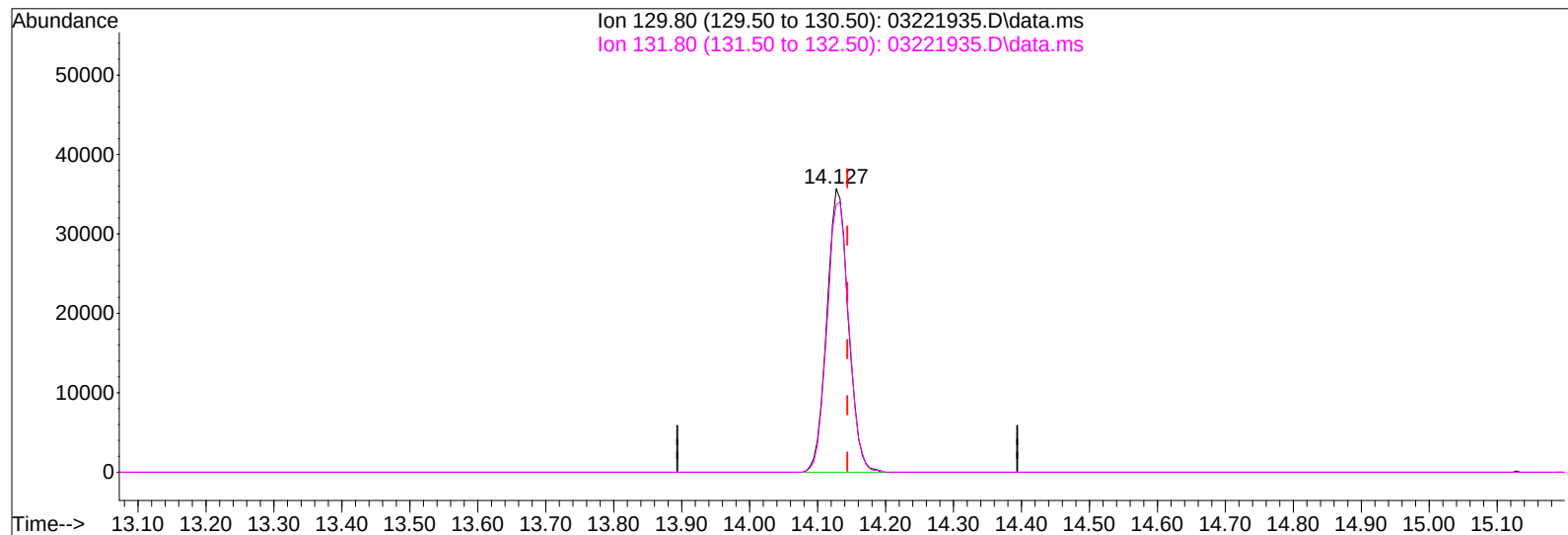
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221935.D\data.ms

(47) Trichloroethene (T)

14.127min (-0.017) 3.14ng

response 78416

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	97.09
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221935.D

Acq On : 22 Mar 2019 22:53

Operator: LH

Sample : P1901513-006 (1000mL)

Misc : S31-02111911

ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 25 13:58:33 2019

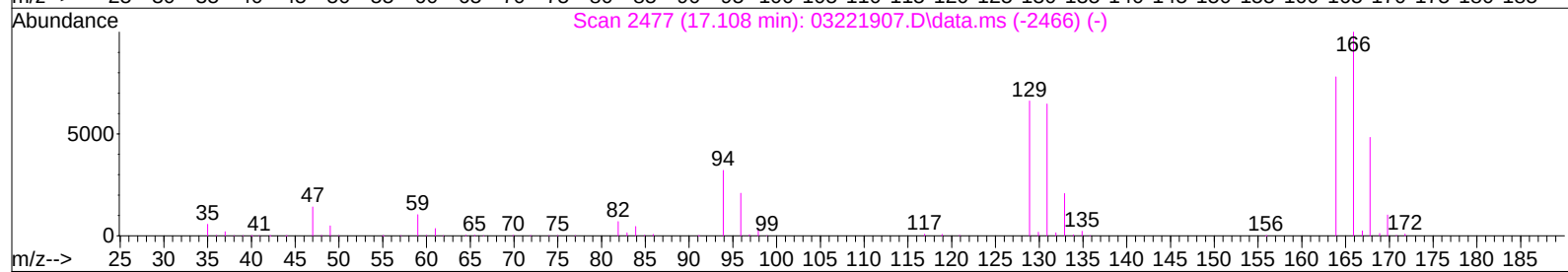
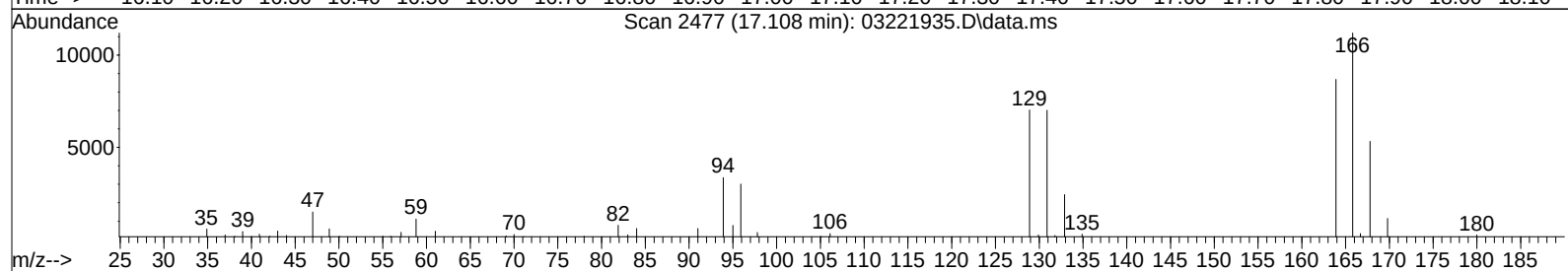
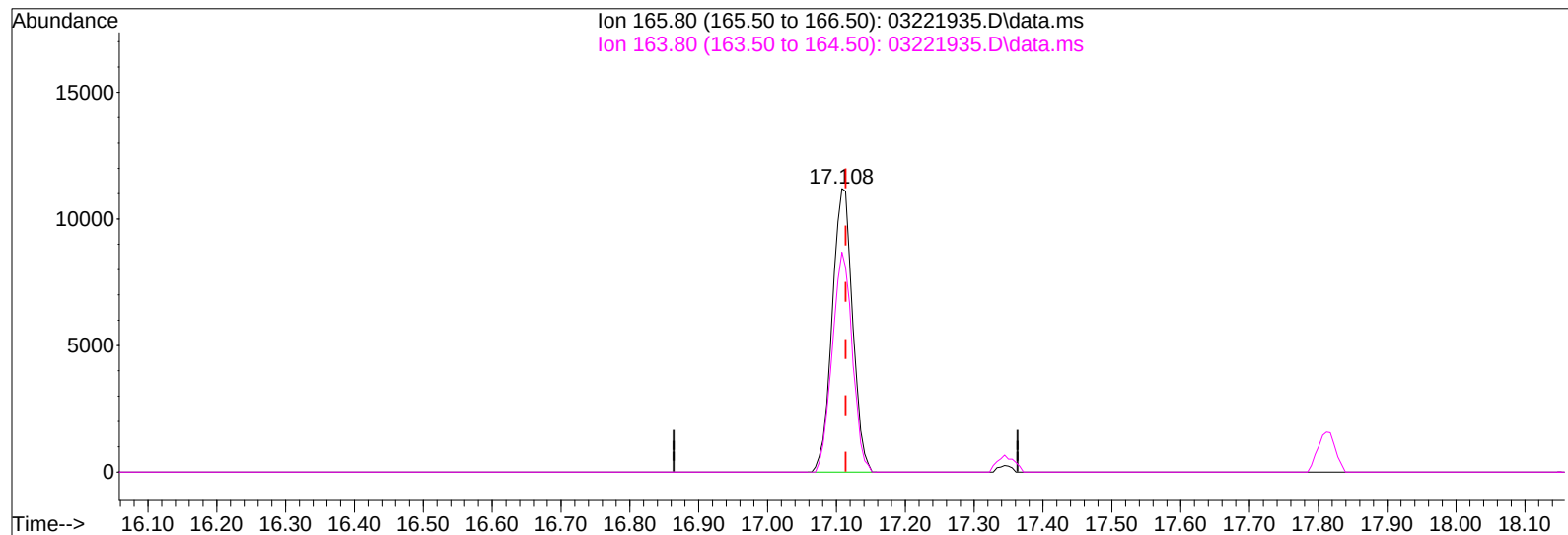
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221935.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.006) 0.87ng

response 23093

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	76.44
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKIAF031919-6

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-007

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Silonite Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SSC00299

Initial Pressure (psig): -1.86 Final Pressure (psig): 3.76

Container Dilution Factor: 1.44

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.11	ND	0.040	0.027	
79-01-6	Trichloroethene	2.2	0.16	0.10	0.40	0.029	0.019	
127-18-4	Tetrachloroethene	0.59	0.16	0.099	0.087	0.023	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.

Data File: I:\MS16\DATA\2019 03\22\03221936.D

Acq On : 22 Mar 2019 23:26

Operator: LH

Sample : P1901513-007 (1000mL)

Misc : S31-02111911

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Mar 25 15:04:57 2019

Quant Method : I:\MS16\METHODS\R16032219.M

LH 3/25/19

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	201297	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	883584	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	359728	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	245664	12.736	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.92%
57) Toluene-d8 (SS2)	15.87	98	848837	12.899	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.20%
73) Bromofluorobenzene (SS3)	19.09	174	366440	13.165	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.28%

Target Compounds

						Qvalue
2) Propene	4.04	42	15204	0.852	ng	92
3) Dichlorodifluoromethan...	4.22	85	60439	1.742	ng	100
4) Chloromethane	4.52	50	5991	0.220	ng	90
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	2025	0.090	ng	84
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.24	54	1069	0.058	ng	# 62
8) Bromomethane	5.70	94	138	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.41	45	87801	7.504	ng	98
11) Acetonitrile	6.75	41	1790	0.061	ng	# 17
12) Acrolein	6.92	56	2615	0.266	ng	90
13) Acetone	7.11	58	74432	5.759	ng	# 51
14) Trichlorofluoromethane	7.35	101	28649	0.929	ng	98
15) 2-Propanol (Isopropanol)	7.64	45	28767	0.751	ng	89
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	8.57	84	129764	6.914	ng	94
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	8.99	151	7030	0.358	ng	95
22) Carbon Disulfide	8.85	76	6769	0.101	ng	91
23) trans-1,2-Dichloroethene	9.87	61	603	N.D.		
24) 1,1-Dichloroethane	0.00	63	0	N.D.		
25) Methyl tert-Butyl Ether	10.26	73	485	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.62	72	36089	3.032	ng	94
28) cis-1,2-Dichloroethene	11.14	61	1023	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.44	61	11141	1.842	ng	99
31) n-Hexane	11.41	57	16204	0.590	ng	99
32) Chloroform	11.49	83	2620	0.084	ng	99
34) Tetrahydrofuran (THF)	11.93	72	1138	0.095	ng	98
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.29	62	1874	0.088	ng	94
38) 1,1,1-Trichloroethane	12.55	97	502	N.D.		
39) Isopropyl Acetate	13.03	61	356	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	55115	0.657	ng	99
42) Carbon Tetrachloride	13.20	117	8112	0.305	ng	98
43) Cyclohexane	13.32	84	5541	0.187	ng	98
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.90	63	309	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	14.13	130	36959	1.499	ng	99
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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Data File: I:\MS16\DATA\2019 03\22\03221936.D

Acq On : 22 Mar 2019 23:26

Operator: LH

Sample : P1901513-007 (1000mL)

Misc : S31-02111911

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Mar 25 15:04:57 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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.	d	
51) n-Heptane	14.45	71	8812	0.495	ng	96
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.04	58	2363	0.150	ng	# 48
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	336348	4.231	ng	99
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	16.84	43	6182	0.170	ng	92
63) n-Octane	16.95	57	4377	0.298	ng	93
64) Tetrachloroethene	17.11	166	11142	0.411	ng	99
65) Chlorobenzene	17.77	112	1974	N.D.		
66) Ethylbenzene	18.11	91	55102	0.591	ng	98
67) m- & p-Xylenes	18.26	91	129048	1.869	ng	96
68) Bromoform	18.34	173	641	N.D.		
69) Styrene	18.59	104	4420	0.078	ng	99
70) o-Xylene	18.69	91	46804	0.668	ng	98
71) n-Nonane	18.87	43	25833	0.808	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	1153	N.D.		
74) Cumene	19.20	105	8188	0.087	ng	74
75) alpha-Pinene	19.54	93	34791	0.739	ng	63
76) n-Propylbenzene	19.64	91	31763	0.304	ng	97
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.76	105	36776	0.430	ng	99
79) 1,3,5-Trimethylbenzene	19.83	105	32788	0.443	ng	96
80) alpha-Methylstyrene	19.97	118	585	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	105557	1.427	ng	89
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.32	91	1216	N.D.		
85) 1,3-Dichlorobenzene	20.32	146	1005	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	10521	0.208	ng	99
87) sec-Butylbenzene	20.42	105	3442	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	20.69	146	743	N.D.		
91) d-Limonene	20.68	68	7882	0.302	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	22.17	180	951	N.D.		
95) Naphthalene	22.28	128	48912	0.437	ng	98
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	0.00	91	0	N.D.	d	

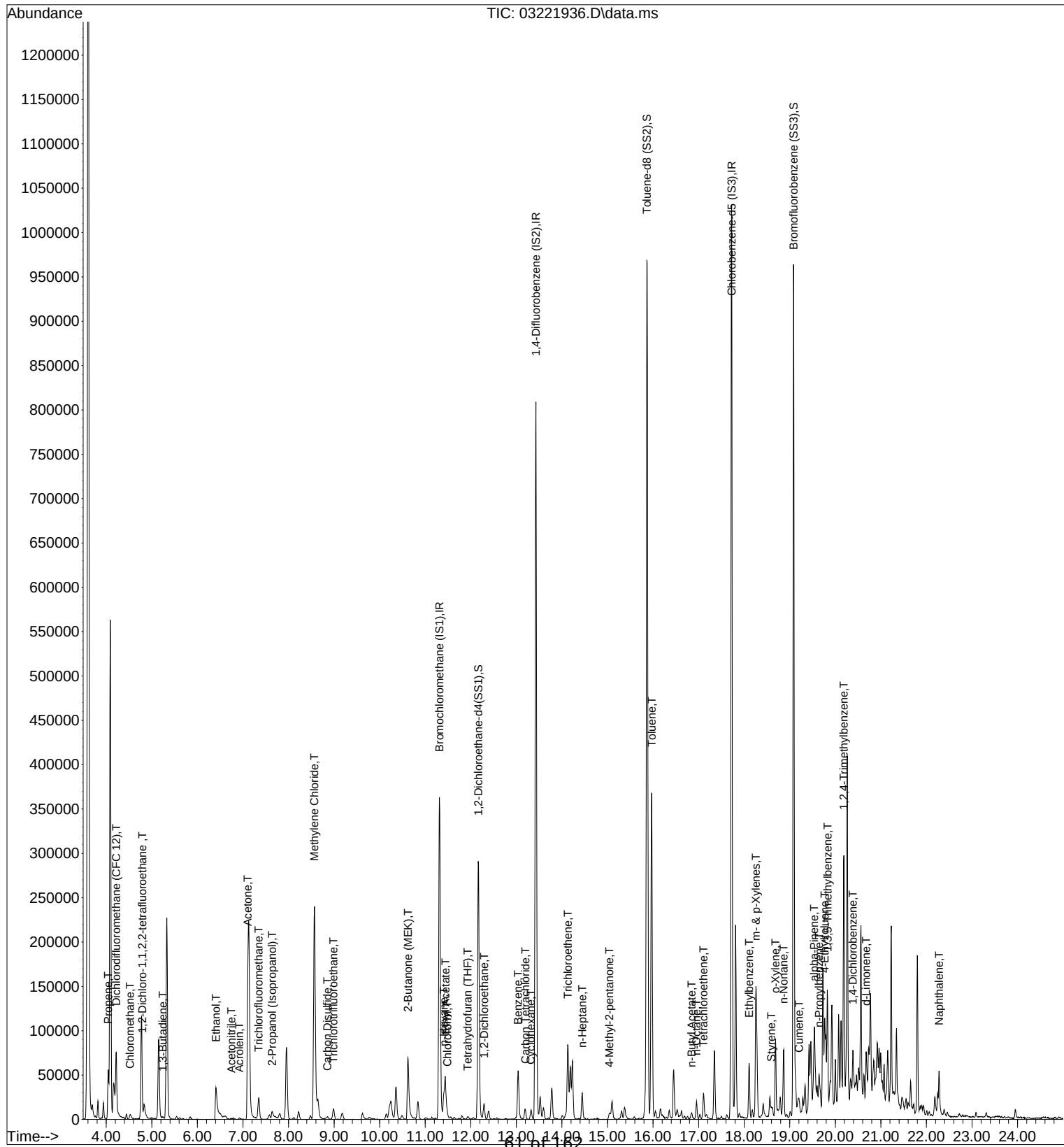
(#)=qualifier out of range (m)=manual integration (+)=signals summed

Data File: I:\MS16\DATA\2019 03\22\03221936.D

Acq On : 22 Mar 2019 23:26
Sample : P1901513-007 (1000mL)
Misc : S31-02111911
ALS Vial : 12 Sample Multiplier

Operator: LH

Quant Time: Mar 25 15:04:57 2019
Quant Method : I:\MS16\METHODS\R16032219.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Mar 22 11:09:04 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221936.D

Acq On : 22 Mar 2019 23:26

Operator: LH

Sample : P1901513-007 (1000mL)

Misc : S31-02111911

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Mar 25 10:56:05 2019

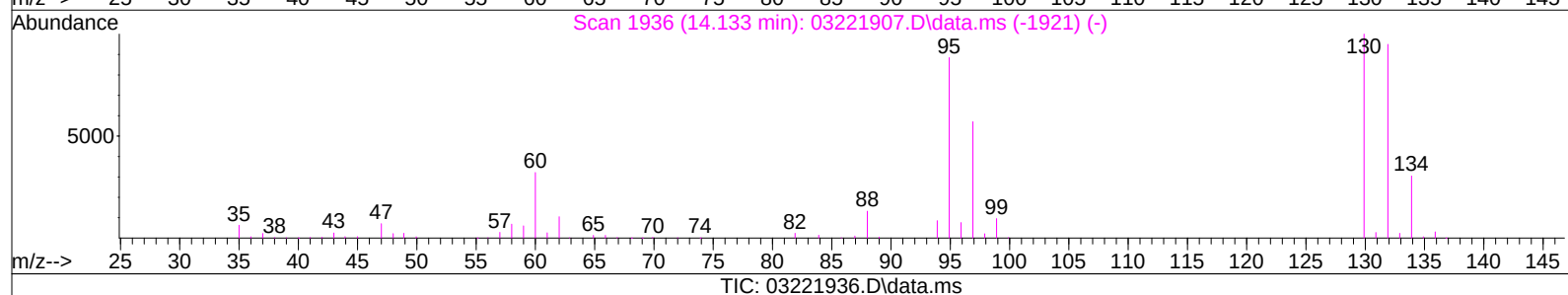
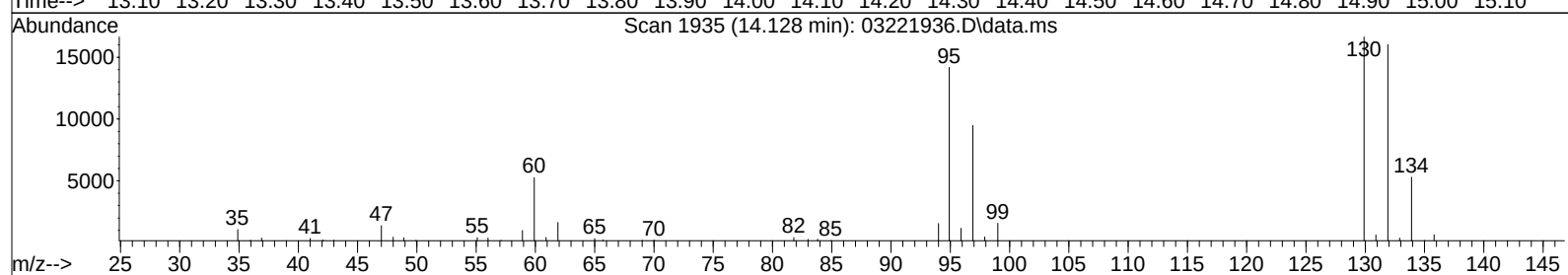
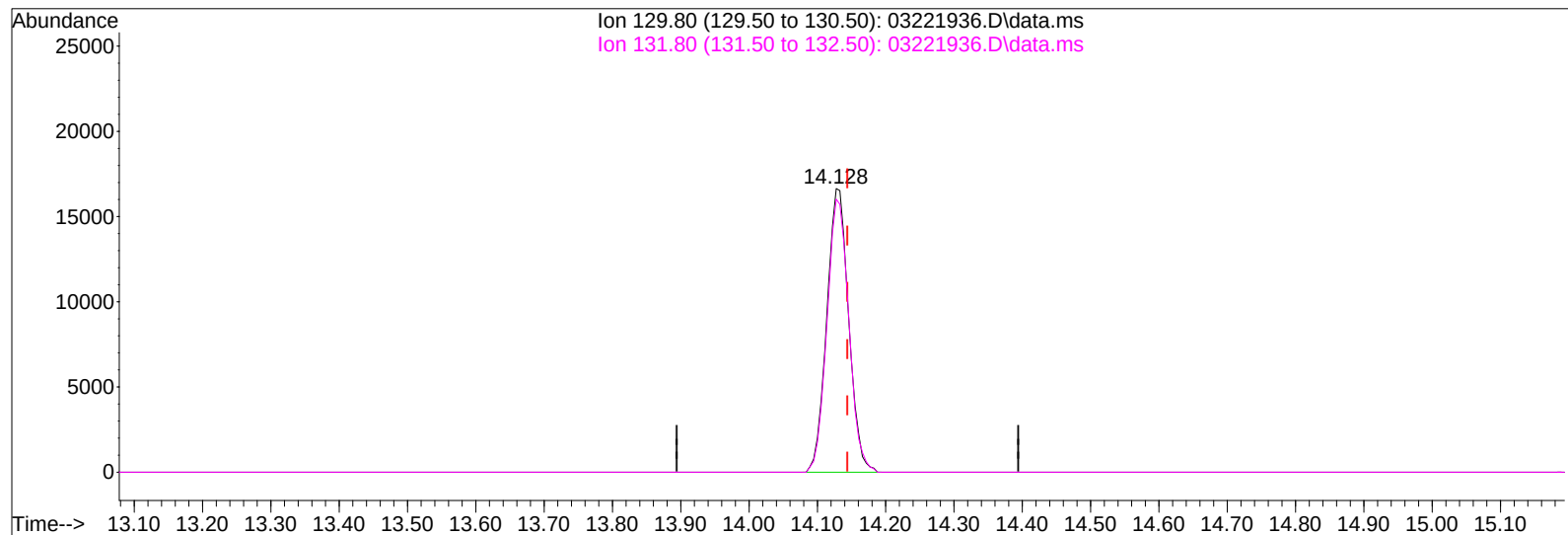
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221936.D\data.ms

(47) Trichloroethene (T)

14.128min (-0.016) 1.50ng

response 36959

Ion	Exp%	Act%
129.80	100	100
131.80	95.70	96.40
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS16\DATA\2019 03\22\03221936.D

Acq On : 22 Mar 2019 23:26

Operator: LH

Sample : P1901513-007 (1000mL)

Misc : S31-02111911

ALS Vial : 12 Sample Multiplier: 1

Quant Time: Mar 25 10:56:05 2019

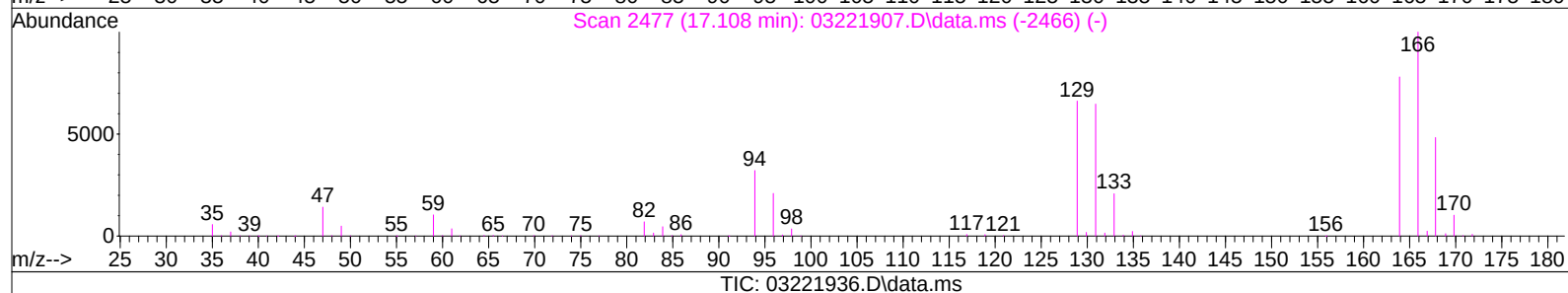
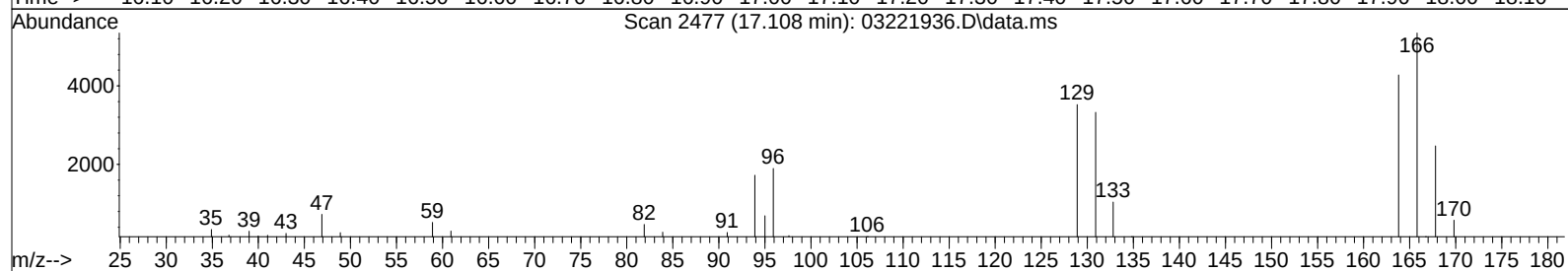
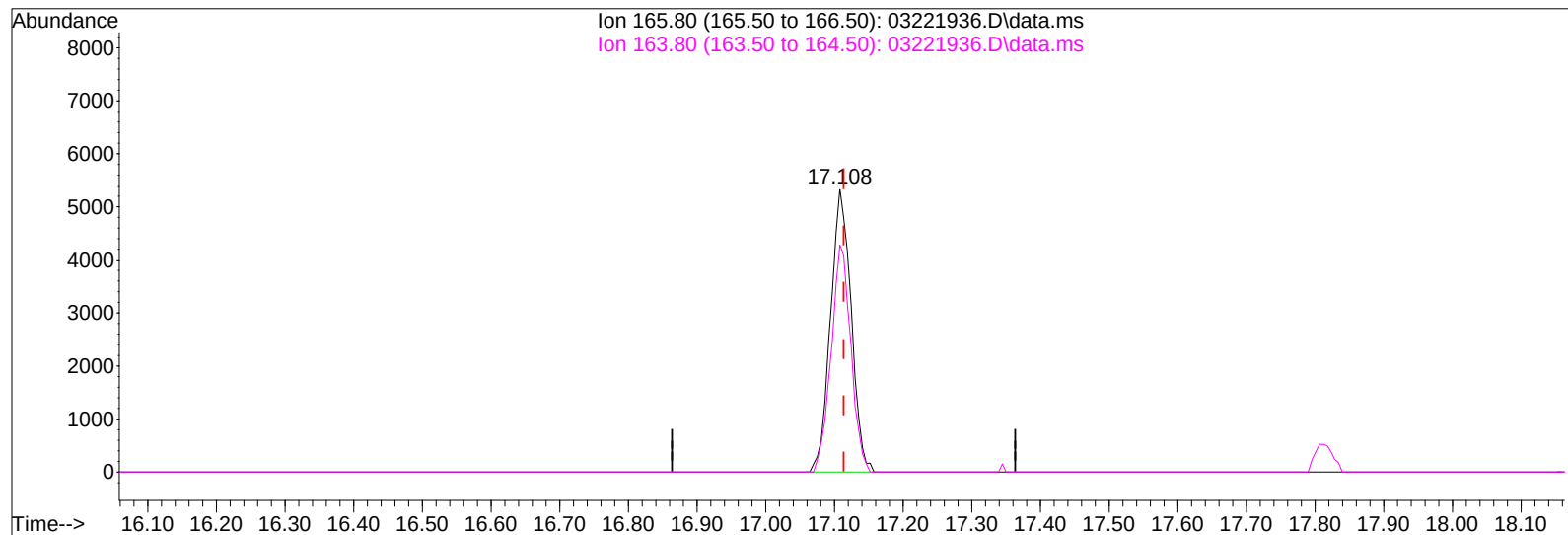
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221936.D\data.ms

(64) Tetrachloroethene (T)

17.108min (-0.005) 0.41ng

response 11142

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	76.93
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKAA031919-1

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-008

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/23/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC01757

Initial Pressure (psig): -1.38 Final Pressure (psig): 3.74

Container Dilution Factor: 1.38

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	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	
79-01-6	Trichloroethene	ND	0.15	0.099	ND	0.028	0.018	
127-18-4	Tetrachloroethene	0.11	0.15	0.095	0.016	0.022	0.014	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.

Data File: I:\MS16\DATA\2019 03\22\03221937.D

Acq On : 23 Mar 2019 00:00

Operator: LH

Sample : P1901513-008 (1000mL)

Misc : S31-02111911

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Mar 25 15:07:14 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	209919	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	865483	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	353381	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	249476	12.403	ng	-0.03
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.20%
57) Toluene-d8 (SS2)	15.87	98	832475	12.877	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.04%
73) Bromofluorobenzene (SS3)	19.09	174	349283	12.774	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.16%

Target Compounds

						Qvalue
2) Propene	4.08	42	7070	0.380	ng	# 33
3) Dichlorodifluoromethan...	4.22	85	62619	1.731	ng	100
4) Chloromethane	4.55	50	6169	0.218	ng	91
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1928	0.082	ng	93
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	5.72	94	516	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.42	45	27130	2.224	ng	99
11) Acetonitrile	6.75	41	5333	0.173	ng	# 41
12) Acrolein	6.95	56	705	0.069	ng	# 37
13) Acetone	7.11	58	81555	6.051	ng	93
14) Trichlorofluoromethane	7.35	101	29381	0.914	ng	100
15) 2-Propanol (Isopropanol)	7.69	45	7525	0.188	ng	73
16) Acrylonitrile	0.00	53	0	N.D.		
17) 1,1-Dichloroethene	0.00	96	0	N.D.		
18) 2-Methyl-2-Propanol (t...	8.66	59	1973	N.D.		
19) Methylene Chloride	8.58	84	4114	0.210	ng	93
20) 3-Chloro-1-propene (Al...	8.67	41	227	N.D.		
21) Trichlorotrifluoroethane	8.99	151	7594	0.371	ng	100
22) Carbon Disulfide	8.87	76	2106	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	10.26	73	189	N.D.		
26) Vinyl Acetate	10.34	86	6543	1.671	ng	# 16
27) 2-Butanone (MEK)	10.62	72	42727	3.442	ng	# 90
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.45	61	5878	0.932	ng	97
31) n-Hexane	11.41	57	3350	0.117	ng	# 88
32) Chloroform	11.48	83	1645	0.051	ng	97
34) Tetrahydrofuran (THF)	11.95	72	643	0.052	ng	# 73
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.30	62	1342	0.061	ng	65
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	13.04	78	24201	0.294	ng	100
42) Carbon Tetrachloride	13.19	117	7348	0.282	ng	99
43) Cyclohexane	13.31	84	904	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	13.88	63	160	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.		
47) Trichloroethene	14.13	130	867	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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Data File: I:\MS16\DATA\2019 03\22\03221937.D

Acq On : 23 Mar 2019 00:00

Operator: LH

Sample : P1901513-008 (1000mL)

Misc : S31-02111911

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Mar 25 15:07:14 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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.	d	
51) n-Heptane	14.45	71	1636	0.094	ng	99
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	15.05	58	1051	0.068	ng	# 1
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	15.97	91	49788	0.638	ng	97
59) 2-Hexanone	16.24	43	4277	0.128	ng	78
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	16.85	43	1542	N.D.		
63) n-Octane	16.95	57	1073	0.074	ng	91
64) Tetrachloroethene	17.11	166	2057	0.077	ng	95
65) Chlorobenzene	17.77	112	454	N.D.		
66) Ethylbenzene	18.11	91	6721	0.073	ng	97
67) m- & p-Xylenes	18.26	91	15444	0.228	ng	95
68) Bromoform	18.35	173	120	N.D.		
69) Styrene	18.60	104	1234	N.D.		
70) o-Xylene	18.69	91	5808	0.084	ng	98
71) n-Nonane	18.87	43	5272	0.168	ng	94
72) 1,1,2,2-Tetrachloroethane	18.69	83	505	N.D.		
74) Cumene	19.21	105	2074	N.D.		
75) alpha-Pinene	19.54	93	2172	N.D.		
76) n-Propylbenzene	19.64	91	7715	0.075	ng	96
77) 3-Ethyltoluene	0.00	105	0	N.D.	d	
78) 4-Ethyltoluene	19.77	105	9923	0.118	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	9349	0.128	ng	95
80) alpha-Methylstyrene	0.00	118	0	N.D.	d	
81) 2-Ethyltoluene	0.00	105	0	N.D.	d	
82) 1,2,4-Trimethylbenzene	20.19	105	28144	0.387	ng	87
83) n-Decane	0.00	57	0	N.D.	d	
84) Benzyl Chloride	20.31	91	145	N.D.		
85) 1,3-Dichlorobenzene	20.33	146	599	N.D.		
86) 1,4-Dichlorobenzene	20.39	146	1154	N.D.		
87) sec-Butylbenzene	20.42	105	1030	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	3585	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.	d	
90) 1,2-Dichlorobenzene	20.68	146	405	N.D.		
91) d-Limonene	20.68	68	2110	0.082	ng	97
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	22.17	180	703	N.D.		
95) Naphthalene	22.28	128	8123	0.074	ng	87
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	20.89	91	2462	N.D.		

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

Data File: I:\MS16\DATA\2019 03\22\03221937.D

Acq On : 23 Mar 2019 00:00

Operator: LH

Sample : P1901513-008 (1000mL)

Misc : S31-02111911

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Mar 25 15:07:14 2019

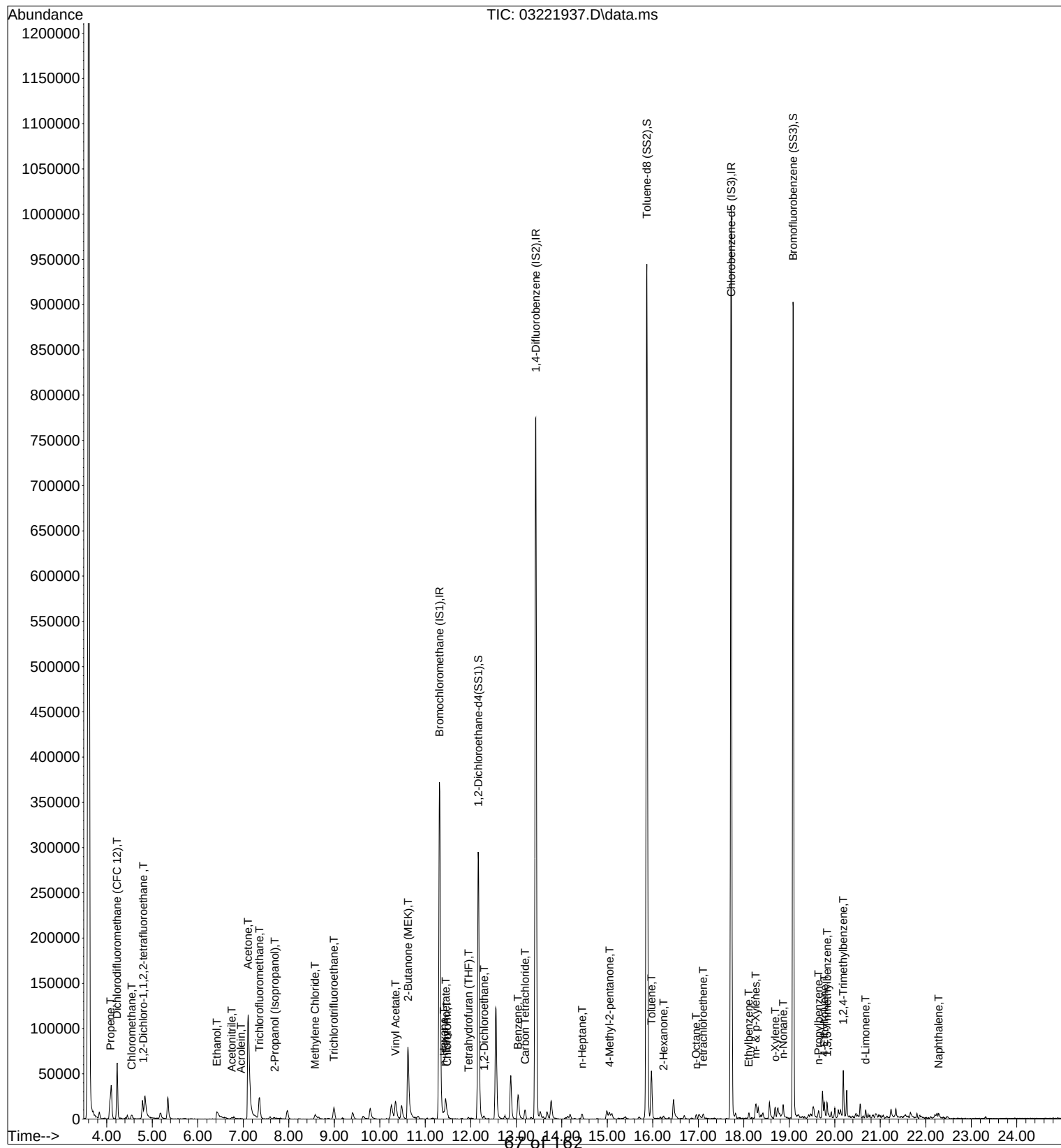
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221937.D

Acq On : 23 Mar 2019 00:00

Operator: LH

Sample : P1901513-008 (1000mL)

Misc : S31-02111911

ALS Vial : 13 Sample Multiplier: 1

Quant Time: Mar 25 10:56:08 2019

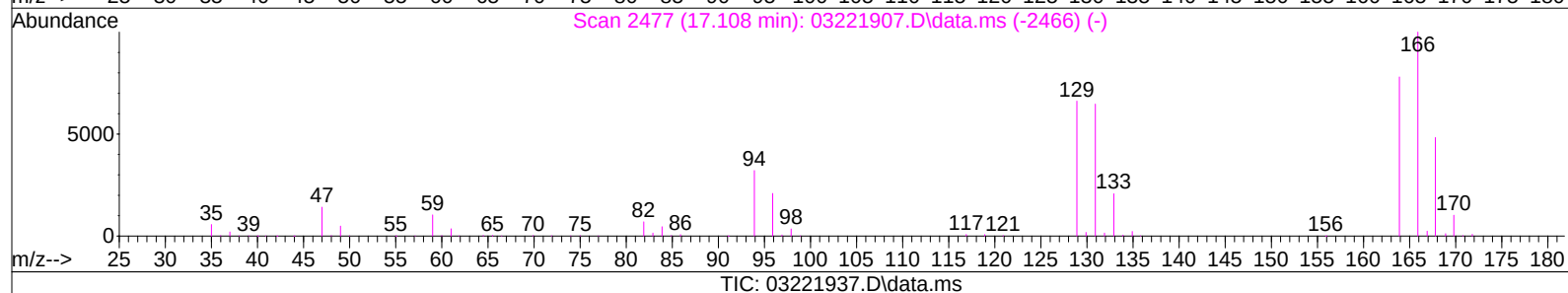
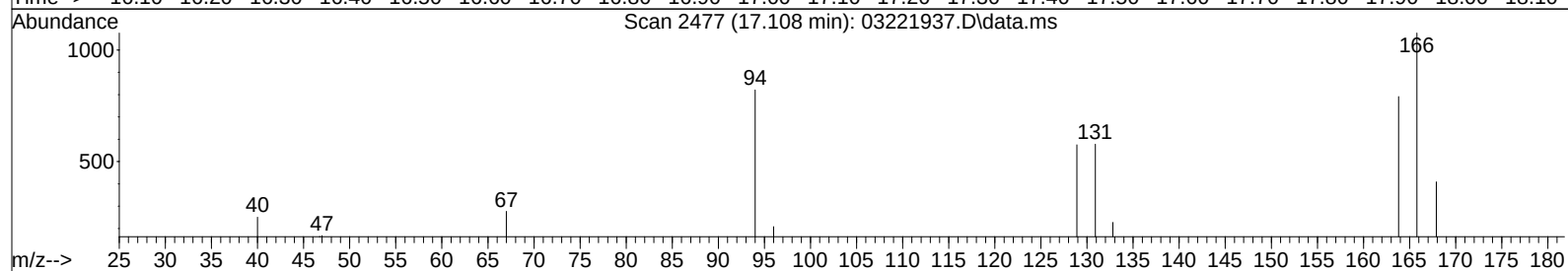
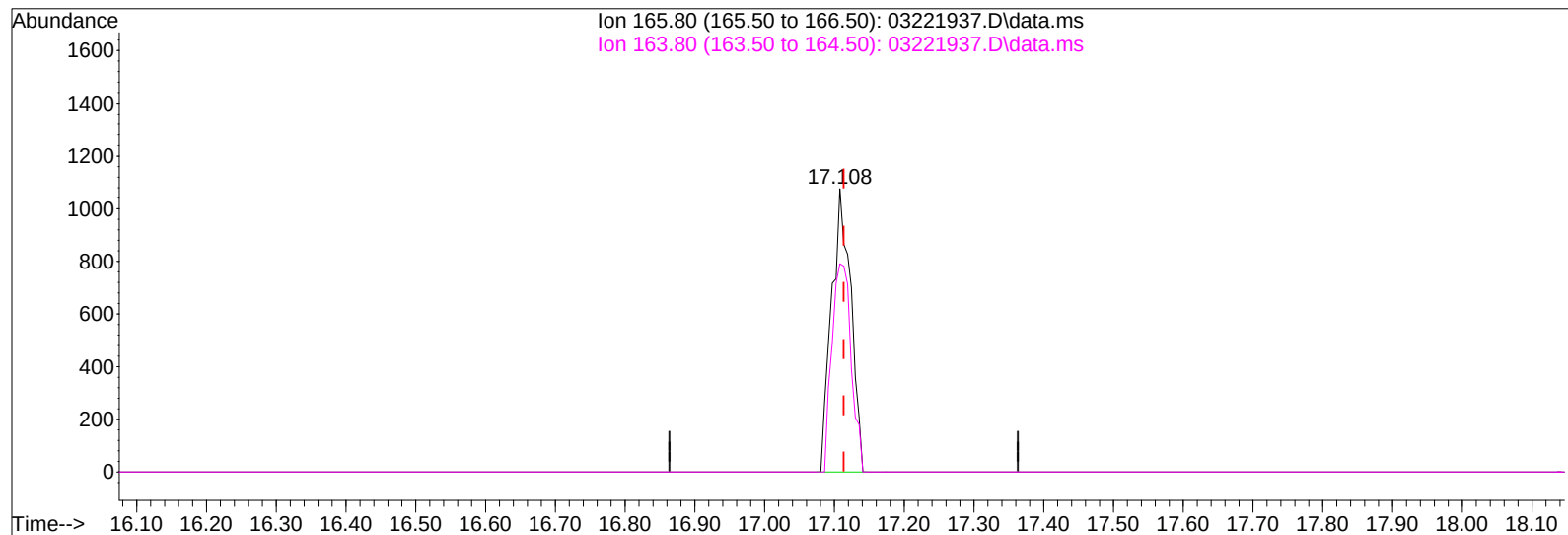
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



(64) Tetrachloroethene (T)

17.108min (-0.006) 0.08ng

response 2057

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	73.65
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: HUCKAA031919-2

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Sample ID: P1901513-009

Test Code: EPA TO-15

Date Collected: 3/19/19

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

Date Received: 3/22/19

Analyst: Lusine Hakobyan

Date Analyzed: 3/23/19

Sample Type: 6.0 L Summa Canister

Volume(s) Analyzed: 1.00 Liter(s)

Test Notes:

Container ID: SC02181

Initial Pressure (psig): -1.40 Final Pressure (psig): 3.89

Container Dilution Factor: 1.40

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.15	0.11	ND	0.039	0.026	
79-01-6	Trichloroethene	ND	0.15	0.10	ND	0.029	0.019	
127-18-4	Tetrachloroethene	0.11	0.15	0.097	0.016	0.023	0.014	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.

Data File: I:\MS16\DATA\2019 03\22\03221939.D

Acq On : 23 Mar 2019 1:07

Operator: LH

Sample : P1901513-009 (1000mL)

Misc : S31-02111911

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Mar 25 15:14:51 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/25/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	195765	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	832341	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	340230	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	235667	12.563	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.48%
57) Toluene-d8 (SS2)	15.87	98	805896	12.948	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.60%
73) Bromofluorobenzene (SS3)	19.09	174	347767	13.210	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.68%

Target Compounds

						Qvalue
2) Propene	4.08	42	5570	0.321	ng	# 29
3) Dichlorodifluoromethan...	4.23	85	58625	1.737	ng	99
4) Chloromethane	4.54	50	6616	0.250	ng	90
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	1658	0.076	ng	76
6) Vinyl Chloride	0.00	62	0	N.D.		
7) 1,3-Butadiene	5.26	54	116	N.D.		
8) Bromomethane	5.71	94	428	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.42	45	31257	2.747	ng	98
11) Acetonitrile	6.74	41	10447	0.364	ng	80
12) Acrolein	6.93	56	1479	0.154	ng	# 69
13) Acetone	7.11	58	65232	5.190	ng	99
14) Trichlorofluoromethane	7.35	101	28253	0.942	ng	99
15) 2-Propanol (Isopropanol)	7.68	45	5303	0.142	ng	60
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...	8.62	59	1217	N.D.		
19) Methylene Chloride	8.58	84	4839	0.265	ng	94
20) 3-Chloro-1-propene (Al...	8.75	41	233	N.D.		
21) Trichlorotrifluoroethane	9.00	151	7917	0.415	ng	99
22) Carbon Disulfide	8.86	76	6482	0.100	ng	96
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.		
24) 1,1-Dichloroethane	10.11	63	107	N.D.		
25) Methyl tert-Butyl Ether	10.26	73	267	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.	d	
27) 2-Butanone (MEK)	10.65	72	5431	0.469	ng	97
28) cis-1,2-Dichloroethene	11.14	61	170	N.D.		
29) Diisopropyl Ether	0.00	87	0	N.D.		
30) Ethyl Acetate	11.45	61	8590	1.460	ng	100
31) n-Hexane	11.42	57	2868	0.107	ng	# 91
32) Chloroform	11.48	83	1866	0.061	ng	99
34) Tetrahydrofuran (THF)	11.94	72	863	0.074	ng	# 86
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	12.29	62	1514	0.073	ng	96
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
39) Isopropyl Acetate	13.02	61	103	N.D.		
40) 1-Butanol	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	23616	0.299	ng	99
42) Carbon Tetrachloride	13.19	117	8245	0.329	ng	97
43) Cyclohexane	13.33	84	1031	N.D.		
44) tert-Amyl Methyl Ether	13.68	73	108	N.D.		
45) 1,2-Dichloropropane	13.90	63	284	N.D.		
46) Bromodichloromethane	14.09	83	198	N.D.		
47) Trichloroethene	14.14	130	485	N.D.		
48) 1,4-Dioxane	14.15	88	1091	0.073	ng	98
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d	

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Data File: I:\MS16\DATA\2019 03\22\03221939.D

Acq On : 23 Mar 2019 1:07

Operator: LH

Sample : P1901513-009 (1000mL)

Misc : S31-02111911

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Mar 25 15:14:51 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.35	100	173	N.D.		
51) n-Heptane	14.44	71	1416	0.084 ng		94
52) cis-1,3-Dichloropropene	15.00	75	394	N.D.		
53) 4-Methyl-2-pentanone	15.06	58	579	N.D.		
54) trans-1,3-Dichloropropene	15.53	75	464	N.D.		
55) 1,1,2-Trichloroethane	15.70	97	130	N.D.		
58) Toluene	15.97	91	43549	0.579 ng		89
59) 2-Hexanone	16.24	43	3692	0.115 ng		79
60) Dibromochloromethane	16.39	129	194	N.D.		
61) 1,2-Dibromoethane	16.65	107	787	N.D.		
62) n-Butyl Acetate	16.85	43	3578	0.104 ng		96
63) n-Octane	16.96	57	1988	0.143 ng	#	77
64) Tetrachloroethene	17.11	166	1941	0.076 ng		96
65) Chlorobenzene	17.77	112	2486	N.D.		
66) Ethylbenzene	18.11	91	8862	0.100 ng		94
67) m- & p-Xylenes	18.26	91	24521	0.375 ng		74
68) Bromoform	18.35	173	546	N.D.		
69) Styrene	18.60	104	3987	0.075 ng	#	70
70) o-Xylene	18.69	91	6176	0.093 ng		84
71) n-Nonane	18.86	43	3902	0.129 ng		84
72) 1,1,2,2-Tetrachloroethane	18.68	83	659	N.D.		
74) Cumene	19.20	105	2582	N.D.		
75) alpha-Pinene	19.54	93	1625	N.D.		
76) n-Propylbenzene	19.64	91	7636	0.077 ng		88
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	19.77	105	8153	0.101 ng		99
79) 1,3,5-Trimethylbenzene	19.84	105	6308	0.090 ng		98
80) alpha-Methylstyrene	0.00	118	0	N.D. d		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	20.19	105	18388	0.263 ng		91
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	20.31	91	2977	0.056 ng		84
85) 1,3-Dichlorobenzene	20.33	146	4274	0.092 ng		100
86) 1,4-Dichlorobenzene	20.39	146	6317	0.132 ng		98
87) sec-Butylbenzene	20.42	105	1933	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	20.68	146	3044	0.069 ng		93
91) d-Limonene	20.68	68	1609	0.065 ng		89
92) 1,2-Dibromo-3-Chloropr...	21.06	157	682	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	22.17	180	6195	0.170 ng		97
95) Naphthalene	22.28	128	27288	0.258 ng		99
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	22.58	225	588	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	20.19	119	3156	N.D.		
100) n-Butylbenzene	0.00	91	0	N.D. d		

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

Data File: I:\MS16\DATA\2019 03\22\03221939.D

Acq On : 23 Mar 2019 1:07

Operator: LH

Sample : P1901513-009 (1000mL)

Misc : S31-02111911

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Mar 25 15:14:51 2019

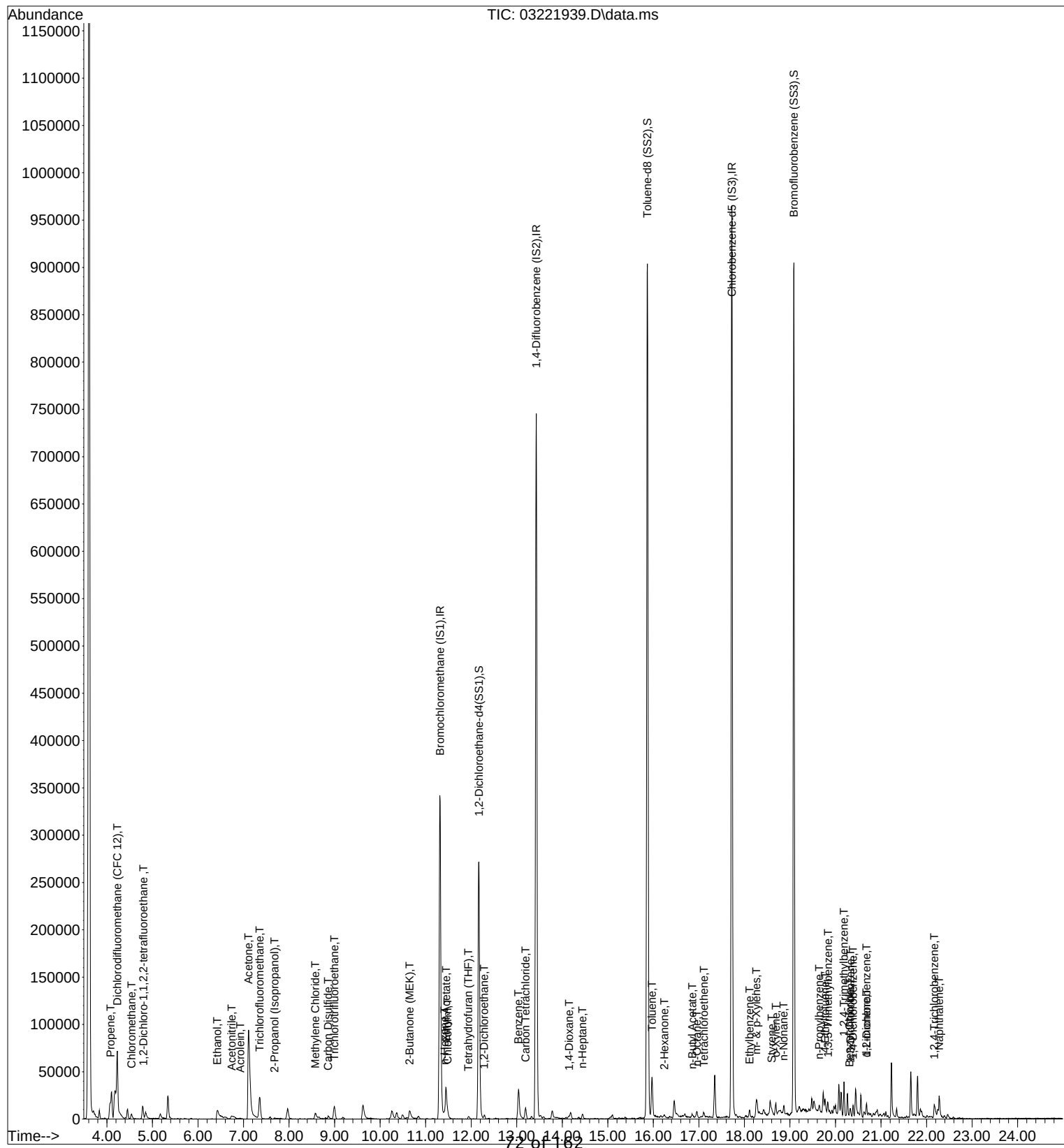
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221939.D

Acq On : 23 Mar 2019 1:07

Operator: LH

Sample : P1901513-009 (1000mL)

Misc : S31-02111911

ALS Vial : 14 Sample Multiplier: 1

Quant Time: Mar 25 10:56:13 2019

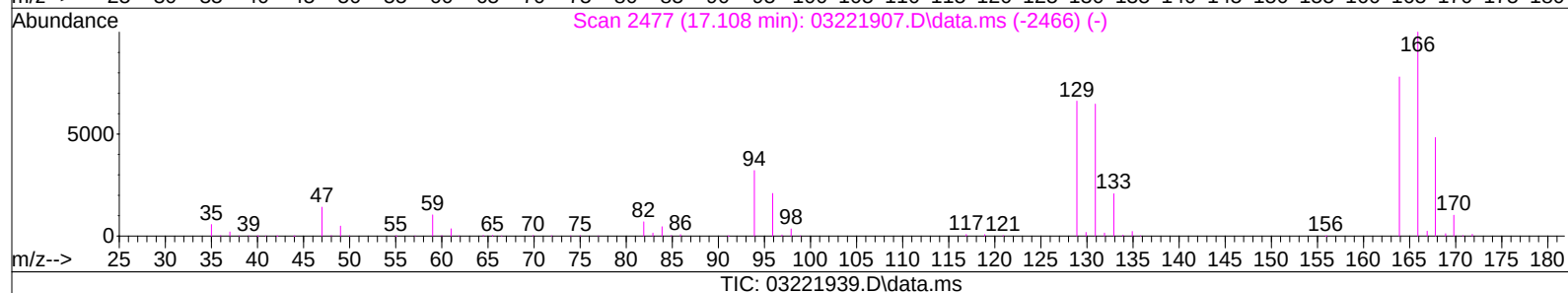
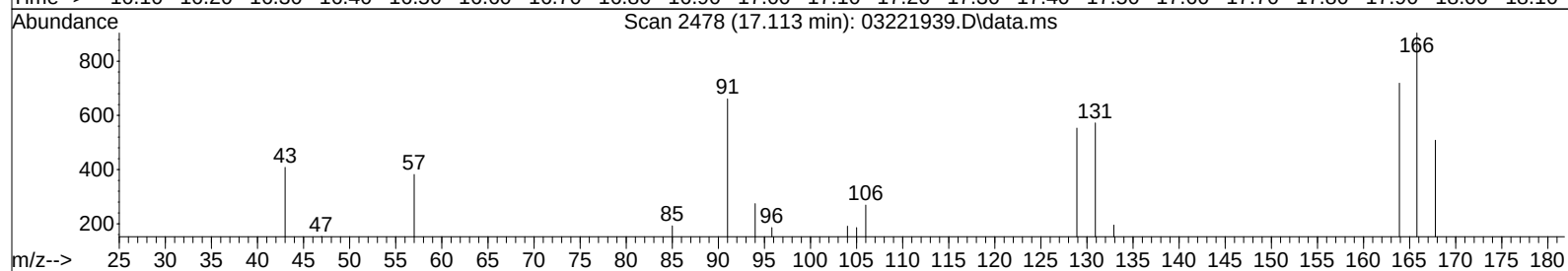
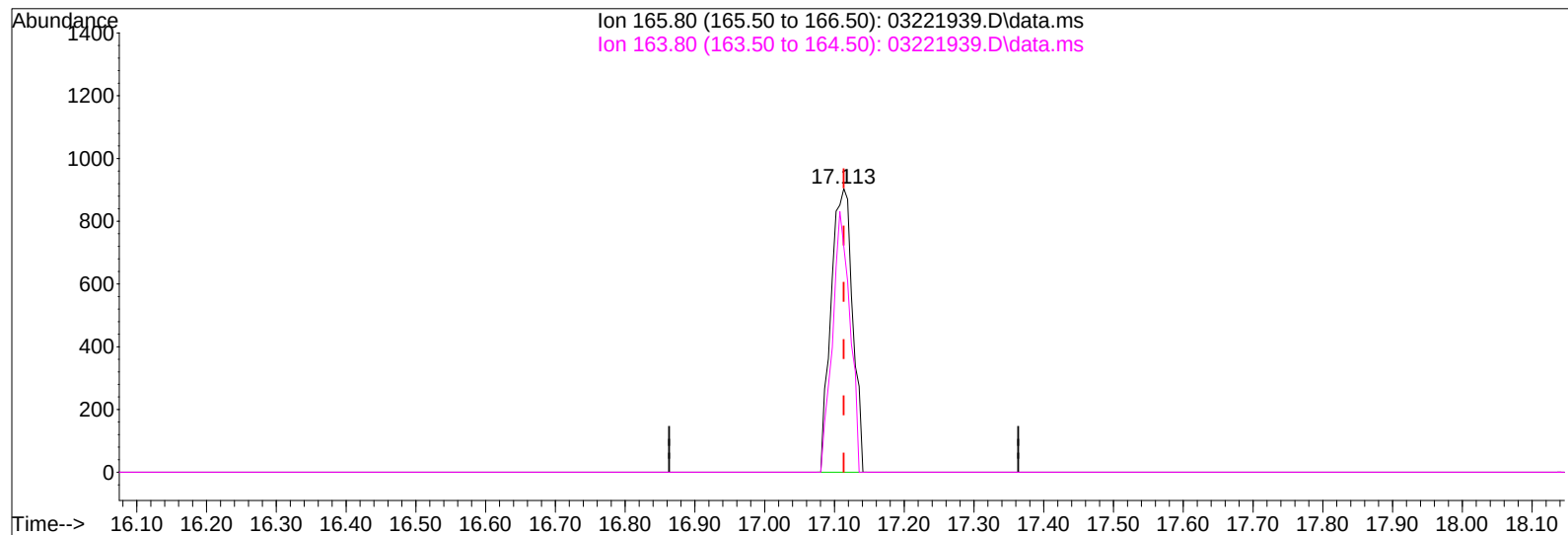
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



TIC: 03221939.D\data.ms

(64) Tetrachloroethene (T)

17.113min (-0.000) 0.08ng

response 1941

Ion	Exp%	Act%
165.80	100	100
163.80	78.00	74.34
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: TripBlank031919

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901513

ALS Sample ID: P1901513-010

Test Code: EPA TO-15

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

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Container ID: AS00312

Date Collected: 3/19/19

Date Received: 3/22/19

Date Analyzed: 3/23/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	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	
79-01-6	Trichloroethene	ND	0.11	0.072	ND	0.020	0.013	
127-18-4	Tetrachloroethene	ND	0.11	0.069	ND	0.016	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.

Data File: I:\MS16\DATA\2019 03\22\03221941.D

Acq On : 23 Mar 2019 2:14

Operator: LH

Sample : P1901513-010 (1000mL)

Misc : S31-02111911

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Mar 25 15:15:26 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	203043	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	856118	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	338244	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	240374	12.355	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	98.88%
57) Toluene-d8 (SS2)	15.87	98	804032	12.994	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.92%
73) Bromofluorobenzene (SS3)	19.09	174	345829	13.213	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.68%

Target Compounds

						Qvalue
2) Propene	4.10	42	342	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	5.75	94	216	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	6.48	45	1924	0.163	ng	# 43
11) Acetonitrile	6.80	41	71	N.D.		
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.20	58	2637	0.202	ng	# 83
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.		
16) Acrylonitrile	0.00	53	0	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	8.88	76	2048	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	0.00	56	0	N.D.	d	
41) Benzene	13.04	78	2099	N.D.		
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	13.42	84	358	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...	14.19	57	958	N.D.		

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Data File: I:\MS16\DATA\2019 03\22\03221941.D

Acq On : 23 Mar 2019 2:14

Operator: LH

Sample : P1901513-010 (1000mL)

Misc : S31-02111911

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Mar 25 15:15:26 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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	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	15.98	91	2757	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	16.95	43	287	N.D.		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.76	112	313	N.D.		
66) Ethylbenzene	18.12	91	621	N.D.		
67) m- & p-Xylenes	18.27	91	1783	N.D.		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.63	104	265	N.D.		
70) o-Xylene	18.70	91	695	N.D.		
71) n-Nonane	18.88	43	155	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.21	105	1155	N.D.		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	19.65	91	771	N.D.		
77) 3-Ethyltoluene	19.74	105	1146	N.D.		
78) 4-Ethyltoluene	19.77	105	753	N.D.		
79) 1,3,5-Trimethylbenzene	19.84	105	818	N.D.		
80) alpha-Methylstyrene	20.13	118	312	N.D.		
81) 2-Ethyltoluene	20.01	105	713	N.D.		
82) 1,2,4-Trimethylbenzene	20.20	105	939	N.D.		
83) n-Decane	20.26	57	204	N.D.		
84) Benzyl Chloride	20.33	91	306	N.D.		
85) 1,3-Dichlorobenzene	20.34	146	708	N.D.		
86) 1,4-Dichlorobenzene	20.40	146	985	N.D.		
87) sec-Butylbenzene	20.43	105	229	N.D.		
88) 4-Isopropyltoluene (p-...	20.56	119	446	N.D.		
89) 1,2,3-Trimethylbenzene	20.57	105	311	N.D.		
90) 1,2-Dichlorobenzene	20.68	146	417	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	21.35	57	278	N.D.		
94) 1,2,4-Trichlorobenzene	22.18	180	809	N.D.		
95) Naphthalene	22.30	128	4491	N.D.		
96) n-Dodecane	22.25	57	286	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	18.44	55	133	N.D.		
99) tert-Butylbenzene	20.20	119	334	N.D.		
100) n-Butylbenzene	20.92	91	471	N.D.		

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

Data File: I:\MS16\DATA\2019 03\22\03221941.D

Acq On : 23 Mar 2019 2:14

Operator: LH

Sample : P1901513-010 (1000mL)

Misc : S31-02111911

ALS Vial : 15 Sample Multiplier: 1

Quant Time: Mar 25 15:15:26 2019

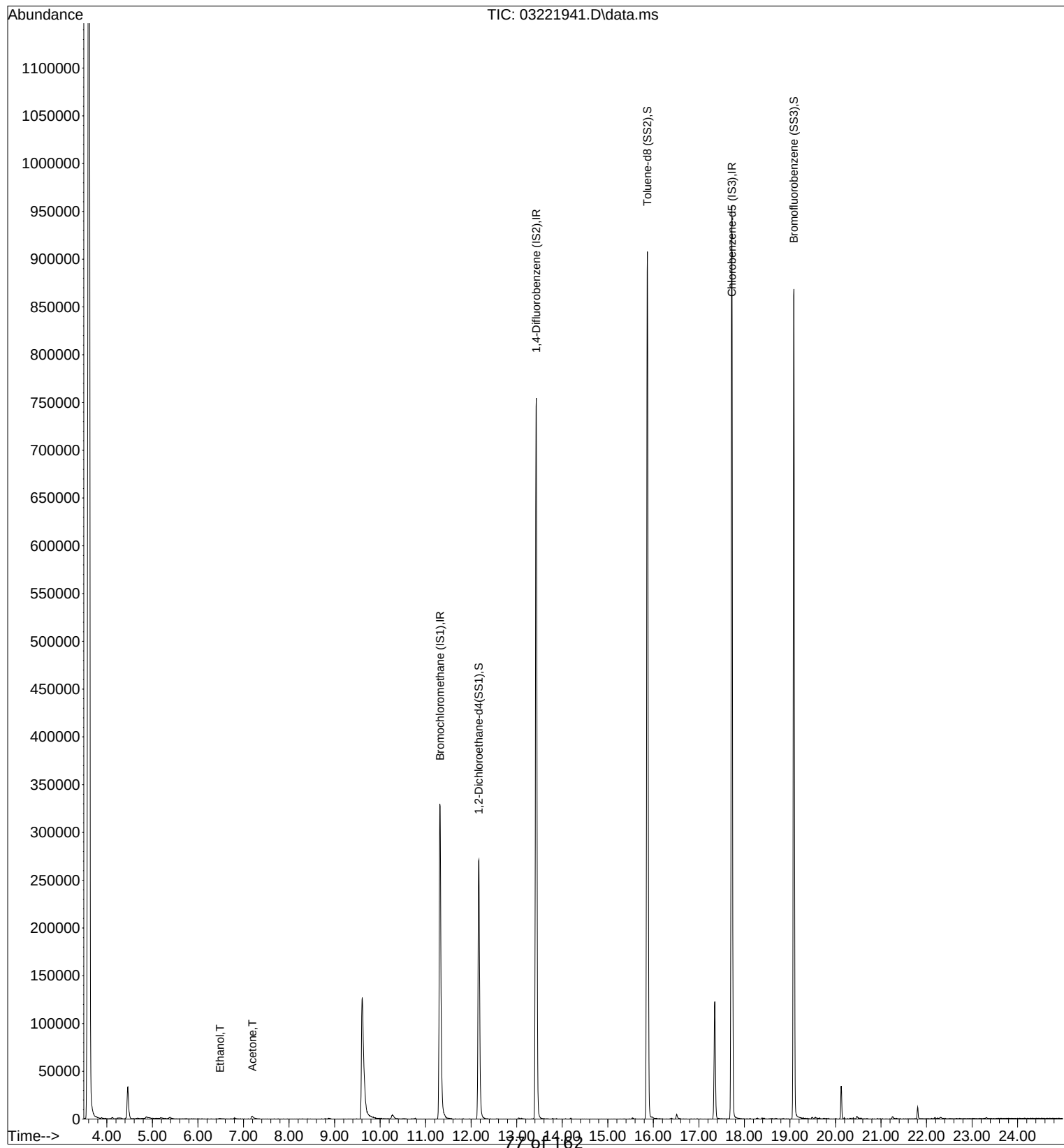
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Method Path : I:\MS16\METHODS\
 Method File : R16032219.M
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Fri Mar 22 11:09:04 2019
 Response Via : Initial Calibration

LH 3/25/19

Calibration Files

0.1 =03221902.D 0.2 =03221903.D 0.5 =03221904.D 1.0 =03221905.D 5.0 =03221906.D 25 =03221907.D
 100 =03221909.D

	Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1) IR	Bromochloromethane...	-----ISTD-----									
2) T	Propene	1.207	1.069	1.080	1.198	1.162	1.045	0.964	1.141	1.108	7.56
3) T	Dichlorodifluo...		2.332	2.294	2.193	2.439	1.997	1.855	1.973	2.155	10.04
4) T	Chloromethane	1.933	1.923	1.898	1.766	1.812	1.599	1.337	1.238	1.688	16.06
5) T	1,2-Dichloro-1...	1.695	1.540	1.440	1.445	1.489	1.314	1.084	1.131	1.392	14.80
6) T	Vinyl Chloride	1.798	1.702	1.778	1.702	1.806	1.576	1.482	1.348	1.649	10.07
7) T	1,3-Butadiene	1.256	1.094	1.148	1.156	1.271	1.143	1.064	0.991	1.141	8.18
8) T	Bromomethane	1.189	1.114	1.137	1.072	1.170	1.040	0.980	1.073	1.097	6.34
9) T	Chloroethane	0.902	0.772	0.768	0.788	0.836	0.738	0.700	0.702	0.776	8.77
10) T	Ethanol	0.829	0.782	0.757	0.722	0.764	0.688	0.644	0.627	0.727	9.62
11) T	Acetonitrile	2.035	1.856	1.876	1.831	1.903	1.741	1.690	1.723	1.832	6.16
12) T	Acrolein	0.480	0.490	0.650	0.657	0.732	0.645	0.613	0.624	0.611	14.00
13) T	Acetone	1.029	0.905	0.908	0.843	0.825	0.695	0.628	0.587	0.803	19.02
14) T	Trichlorofluor...	2.208	2.024	1.994	1.920	2.028	1.765	1.680	1.699	1.915	9.69
15) T	2-Propanol (Is...	2.618	2.542	2.532	2.350	2.737	2.409	2.142	1.693	2.378	13.89
16) T	Acrylonitrile	0.861	1.053	1.245	1.299	1.470	1.358	1.307	1.318	1.239	15.54
17) T	1,1-Dichloroet...	1.244	1.166	1.166	1.110	1.201	1.056	1.109	1.018	1.134	6.62
18) T	2-Methyl-2-Pro...	2.677	2.530	2.571	2.460	2.759	2.450	2.443	1.873	2.471	10.80
19) T	Methylene Chlo...	1.368	1.204	1.193	1.147	1.221	1.068	1.112	1.010	1.165	9.35
20) T	3-Chloro-1-pro...	1.510	1.368	1.387	1.331	1.455	1.289	1.362	1.237	1.367	6.35
21) T	Trichlorotrifl...	1.439	1.282	1.280	1.184	1.266	1.100	1.148	1.054	1.219	10.11
22) T	Carbon Disulfide		4.460	4.291	4.089	4.437	3.915	4.163	3.695	4.150	6.70
23) T	trans-1,2-Dich...	1.461	1.464	1.542	1.499	1.632	1.430	1.492	1.530	1.506	4.17
24) T	1,1-Dichloroet...	2.129	1.943	1.963	1.906	2.013	1.752	1.828	1.869	1.925	6.02
25) T	Methyl tert-Bu...	3.409	3.267	3.238	3.098	3.329	2.913	3.000	3.039	3.162	5.52
26) T	Vinyl Acetate	0.192	0.207	0.226	0.227	0.274	0.248	0.254	0.239	0.233	11.29
27) T	2-Butanone (MEK)	0.678	0.631	0.775	0.756	0.817	0.724	0.768	0.763	0.739	8.03
28) T	cis-1,2-Dichlo...	1.624	1.504	1.506	1.469	1.570	1.493	1.438	1.365	1.496	5.25
29) T	Diisopropyl Ether	1.258	1.114	0.914	0.937	0.949	0.877	0.833	0.765	0.956	16.58
30) T	Ethyl Acetate	0.362	0.356	0.393	0.389	0.425	0.397	0.361	0.321	0.376	8.46
31) T	n-Hexane	2.020	1.754	1.818	1.767	1.784	1.603	1.517	1.379	1.705	11.65
32) T	Chloroform	2.121	1.989	1.998	1.906	2.034	1.914	1.791	1.752	1.938	6.37
33) S	1,2-Dichloroet...	1.234	1.214	1.235	1.234	1.233	1.123	1.096	1.214	1.198	4.65
34) T	Tetrahydrofura...	0.879	0.704	0.739	0.728	0.779	0.736	0.661	0.720	0.743	8.61
35) T	Ethyl tert-But...	1.445	1.319	1.347	1.305	1.402	1.259	1.183	1.302	1.320	6.15
36) T	1,2-Dichloroet...	1.455	1.305	1.376	1.312	1.413	1.230	1.179	1.280	1.319	7.02

37) IR	1,4-Difluorobenzen...	-----ISTD-----									
38) T	1,1,1-Trichlor...	0.422	0.400	0.410	0.392	0.419	0.408	0.397	0.385	0.404	3.22
39) T	Isopropyl Acetate	0.177	0.167	0.172	0.169	0.180	0.169	0.160	0.152	0.168	5.28
40) T	1-Butanol			0.211	0.232	0.264	0.264	0.255	0.238	0.244	8.49
41) T	Benzene	1.579	1.335	1.231	1.123	1.154	1.086	1.032	0.957	1.187	16.53
42) T	Carbon Tetrach...	0.398	0.364	0.365	0.352	0.387	0.387	0.381	0.375	0.376	4.08
43) T	Cyclohexane	0.477	0.432	0.440	0.418	0.436	0.411	0.390	0.357	0.420	8.56
44) T	tert-Amyl Meth...	0.804	0.730	0.724	0.704	0.753	0.736	0.724	0.680	0.732	4.97
45) T	1,2-Dichloropr...	0.293	0.269	0.266	0.253	0.267	0.258	0.251	0.223	0.260	7.59
46) T	Bromodichlorom...	0.374	0.340	0.354	0.338	0.377	0.367	0.356	0.320	0.353	5.51
47) T	Trichloroethene	0.439	0.368	0.352	0.338	0.348	0.336	0.325	0.286	0.349	12.49
48) T	1,4-Dioxane	0.243	0.212	0.225	0.220	0.233	0.235	0.225	0.196	0.224	6.54
49) T	2,2,4-Trimethy...	1.263	1.159	1.120	1.047	1.100	1.032	0.980	0.833	1.067	12.00
50) T	Methyl Methacr...	0.095	0.099	0.109	0.108	0.121	0.117	0.112	0.099	0.108	8.39
51) T	n-Heptane	0.296	0.246	0.263	0.256	0.263	0.244	0.237	0.209	0.252	9.97
52) T	cis-1,3-Dichlo...	0.404	0.385	0.400	0.402	0.402	0.445	0.435	0.387	0.419	8.67
53) T	4-Methyl-2-pen...	0.190	0.203	0.225	0.224	0.274	0.241	0.231	0.199	0.223	12.00
54) T	trans-1,3-Dich...	0.299	0.290	0.331	0.336	0.446	0.407	0.403	0.369	0.360	15.45

55)	T	1,1,2-Trichlor...	0.313	0.269	0.281	0.272	0.318	0.276	0.269	0.241	0.280	8.83
56)	IR	Chlorobenzene-d5 (...	-----ISTD-----									
57)	S	Toluene-d8 (SS2)	2.342	2.327	2.325	2.328	2.570	2.123	2.142	2.136	2.287	6.58
58)	T	Toluene		2.997	2.953	2.803	3.206	2.492	2.610	2.276	2.762	11.67
59)	T	2-Hexanone	0.978	1.031	1.247	1.243	1.449	1.182	1.253	1.041	1.178	13.18
60)	T	Dibromochlorom...	0.837	0.780	0.797	0.797	0.963	0.809	0.878	0.763	0.828	7.83
61)	T	1,2-Dibromoethane	0.799	0.744	0.775	0.783	0.913	0.746	0.795	0.695	0.781	8.09
62)	T	n-Butyl Acetate	1.022	1.064	1.244	1.310	1.591	1.315	1.417	1.158	1.265	14.79
63)	T	n-Octane	0.578	0.542	0.556	0.522	0.531	0.457	0.496	0.399	0.510	11.40
64)	T	Tetrachloroethene	1.114	0.987	0.980	0.935	0.965	0.901	0.893	0.761	0.942	10.67
65)	T	Chlorobenzene	2.388	2.115	2.075	1.987	2.084	1.983	1.907	1.781	2.040	8.70
66)	T	Ethylbenzene	3.783	3.228	3.331	3.202	3.380	3.172	3.040	2.797	3.242	8.77
67)	T	m- & p-Xylenes	2.737	2.463	2.496	2.409	2.507	2.404	2.202	1.977	2.399	9.40
68)	T	Bromoform	0.719	0.685	0.714	0.709	0.840	0.838	0.812	0.769	0.761	8.21
69)	T	Styrene	2.028	1.797	1.957	1.964	2.148	2.072	1.961	1.794	1.965	6.28
70)	T	o-Xylene	2.786	2.506	2.538	2.483	2.573	2.417	2.213	1.958	2.434	10.27
71)	T	n-Nonane	1.279	1.207	1.210	1.134	1.174	1.067	0.994	0.819	1.111	13.30
72)	T	1,1,2,2-Tetrac...	1.307	1.186	1.264	1.220	1.317	1.261	1.143	0.988	1.211	8.87
73)	S	Bromofluoroben...	0.969	0.979	0.991	0.997	0.991	0.955	0.940	0.916	0.967	2.93
74)	T	Cumene	3.891	3.276	3.375	3.237	3.417	3.164	3.006	2.661	3.253	10.83
75)	T	alpha-Pinene	1.821	1.612	1.698	1.637	1.765	1.518	1.614	1.414	1.635	7.98
76)	T	n-Propylbenzene		3.869	3.915	3.853	3.980	3.354	3.423	3.039	3.633	9.91
77)	T	3-Ethyltoluene	3.739	3.129	3.323	3.258	3.416	2.882	3.194	2.581	3.191	10.88
78)	T	4-Ethyltoluene	3.396	3.204	3.239	3.043	3.200	2.731	2.620	2.334	2.971	12.40
79)	T	1,3,5-Trimethy...		2.853	2.824	2.738	2.801	2.375	2.426	2.000	2.574	12.38
80)	T	alpha-Methylst...	1.384	1.336	1.449	1.467	1.613	1.379	1.418	1.152	1.400	9.30
81)	T	2-Ethyltoluene		3.347	3.428	3.238	3.315	2.780	2.800	2.281	3.027	13.88
82)	T	1,2,4-Trimethy...	2.970	2.710	2.761	2.737	2.821	2.336	2.353	1.871	2.570	13.94
83)	T	n-Decane	1.431	1.338	1.377	1.344	1.357	1.112	1.090	0.840	1.236	16.41
84)	T	Benzyl Chloride				1.569	2.129	2.075	2.189	1.805	1.953	13.32
85)	T	1,3-Dichlorobe...	1.940	1.799	1.864	1.779	1.836	1.554	1.571	1.267	1.701	13.03
86)	T	1,4-Dichlorobe...	2.119	1.878	1.886	1.821	1.893	1.563	1.581	1.301	1.755	14.64
87)	T	sec-Butylbenzene		3.830	3.830	3.734	3.809	3.171	3.130	2.496	3.429	15.00
88)	T	4-Isopropyltol...	3.806	3.490	3.630	3.544	3.650	2.996	2.972	2.263	3.294	15.64
89)	T	1,2,3-Trimethy...		2.862	2.854	2.757	2.851	2.338	2.372	1.835	2.553	15.26
90)	T	1,2-Dichlorobe...	1.921	1.784	1.794	1.724	1.767	1.455	1.432	1.140	1.627	15.97
91)	T	d-Limonene	0.959	0.882	1.017	1.006	1.075	0.867	0.839	0.621	0.908	15.64
92)	T	1,2-Dibromo-3-...	0.430	0.532	0.591	0.603	0.692	0.616	0.637	0.534	0.579	13.80
93)	T	n-Undecane	1.340	1.357	1.457	1.422	1.517	1.185	1.077	0.891	1.281	16.67
94)	T	1,2,4-Trichlor...	1.440	1.293	1.408	1.401	1.529	1.284	1.215	1.125	1.337	9.84
95)	T	Naphthalene	4.238	3.607	4.160	4.206	4.597	3.726	3.499	3.091	3.890	12.63
96)	T	n-Dodecane	1.296	1.192	1.334	1.397	1.578	1.106	1.003	0.867	1.222	18.65
97)	T	Hexachlorobuta...	1.210	0.987	0.978	0.967	1.001	0.837	0.792	0.776	0.944	15.01
98)	T	Cyclohexanone	0.886	0.874	0.886	0.876	0.942	0.987	0.939	0.858	0.906	4.95
99)	T	tert-Butylbenzene	3.063	2.861	2.850	2.697	2.789	2.325	2.319	1.834	2.592	15.51
100)	T	n-Butylbenzene	2.966	2.846	3.003	2.892	3.081	2.526	2.534	2.017	2.733	12.99

(#) = Out of Range

R16032219.M Mon Mar 25 12:09:49 2019

1ng/L Std. ID:
4ng/L Std. ID: S31-03201908
20ng/L Std. ID: S31-03201907
200ng/L Std. ID: S31-03181909

Dilution Factors:

Primary Source Standards Concentrations (Working & Initial Calibration)

LH 3/25/19

Dilution Factors:										Working STD Conc.(ng/L):												
Compounds	Source Std. mg/m ³	Primary Working Standards					4				4				20				200			
		200ng/L	20ng/L	2ng/L	4ng/L	1ng/L	0.025	0.050	0.125	0.25	0.025	0.050	0.125	0.25	0.025	0.050	0.125	0.25	0.025	0.050	0.125	0.25
Propene	1.031	206.2	20.62	2.062	4.124	1.031	0.1031	0.2062	0.5155	1.031	0.1031	0.2062	0.5155	1.031	0.1031	0.2062	0.5155	1.031	0.1031	0.2062	0.5155	1.031
Dichlorodifluoromethane	1.045	209.0	20.90	2.090	4.180	1.045	0.1045	0.2090	0.5225	1.045	0.1045	0.2090	0.5225	1.045	0.1045	0.2090	0.5225	1.045	0.1045	0.2090	0.5225	1.045
Chloromethane	1.008	201.6	20.16	2.016	4.032	1.008	0.1008	0.2016	0.5040	1.008	0.1008	0.2016	0.5040	1.008	0.1008	0.2016	0.5040	1.008	0.1008	0.2016	0.5040	1.008
Freon-114	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028
Vinyl Chloride	1.051	210.2	21.02	2.102	4.204	1.051	0.1051	0.2102	0.5255	1.051	0.1051	0.2102	0.5255	1.051	0.1051	0.2102	0.5255	1.051	0.1051	0.2102	0.5255	1.051
1,3-Butadiene	1.049	209.8	20.98	2.098	4.196	1.049	0.1049	0.2098	0.5245	1.049	0.1049	0.2098	0.5245	1.049	0.1049	0.2098	0.5245	1.049	0.1049	0.2098	0.5245	1.049
Bromomethane	1.009	201.8	20.18	2.018	4.036	1.009	0.1009	0.2018	0.5045	1.009	0.1009	0.2018	0.5045	1.009	0.1009	0.2018	0.5045	1.009	0.1009	0.2018	0.5045	1.009
Chloroethane	1.022	204.4	20.44	2.044	4.088	1.022	0.1022	0.2044	0.5110	1.022	0.1022	0.2044	0.5110	1.022	0.1022	0.2044	0.5110	1.022	0.1022	0.2044	0.5110	1.022
Ethanol	5.140	1028.0	102.80	20.560	5.140		0.5140	1.0280	2.5700	5.140	0.5140	1.0280	2.5700	5.140	0.5140	1.0280	2.5700	5.140	0.5140	1.0280	2.5700	5.140
Acetonitrile	1.033	206.6	20.66	2.066	4.132	1.033	0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033
Acrolein	1.028	205.6	20.56	2.056	4.112	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028	0.1028	0.2056	0.5140	1.028
Acetone	5.370	1074.0	107.40	21.480	5.370		0.5370	1.0740	2.6850	5.370	0.5370	1.0740	2.6850	5.370	0.5370	1.0740	2.6850	5.370	0.5370	1.0740	2.6850	5.370
Trichlorofluoromethane	1.060	212.0	21.20	2.120	4.240	1.060	0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060
Isopropanol	2.063	412.6	41.26	8.252	2.063		0.2063	0.4126	1.0315	2.063	0.2063	0.4126	1.0315	2.063	0.2063	0.4126	1.0315	2.063	0.2063	0.4126	1.0315	2.063
Acrylonitrile	1.034	206.8	20.68	2.068	4.136	1.034	0.1034	0.2068	0.5170	1.034	0.1034	0.2068	0.5170	1.034	0.1034	0.2068	0.5170	1.034	0.1034	0.2068	0.5170	1.034
1,1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074		0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074
tert-Butanol	2.144	428.8	42.88	8.576	2.144		0.2144	0.4288	1.0720	2.144	0.2144	0.4288	1.0720	2.144	0.2144	0.4288	1.0720	2.144	0.2144	0.4288	1.0720	2.144
Methylene Chloride	1.070	214.0	21.40	4.280	1.070		0.1070	0.2140	0.5350	1.070	0.1070	0.2140	0.5350	1.070	0.1070	0.2140	0.5350	1.070	0.1070	0.2140	0.5350	1.070
Allyl Chloride	1.067	213.4	21.34	4.268	1.067		0.1067	0.2134	0.5335	1.067	0.1067	0.2134	0.5335	1.067	0.1067	0.2134	0.5335	1.067	0.1067	0.2134	0.5335	1.067
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065		0.1065	0.2130	0.5325	1.065	0.1065	0.2130	0.5325	1.065	0.1065	0.2130	0.5325	1.065	0.1065	0.2130	0.5325	1.065
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075		0.1075	0.2150	0.5375	1.075	0.1075	0.2150	0.5375	1.075	0.1075	0.2150	0.5375	1.075	0.1075	0.2150	0.5375	1.075
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062		0.1062	0.2124	0.5310	1.062	0.1062	0.2124	0.5310	1.062	0.1062	0.2124	0.5310	1.062	0.1062	0.2124	0.5310	1.062
1,1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030		0.1030	0.2060	0.5150	1.030	0.1030	0.2060	0.5150	1.030	0.1030	0.2060	0.5150	1.030	0.1030	0.2060	0.5150	1.030
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089		0.1089	0.2178	0.5445	1.089	0.1089	0.2178	0.5445	1.089	0.1089	0.2178	0.5445	1.089	0.1089	0.2178	0.5445	1.089
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252		0.5252	1.0504	2.6260	5.252	0.5252	1.0504	2.6260	5.252	0.5252	1.0504	2.6260	5.252	0.5252	1.0504	2.6260	5.252
2-Butanone	1.027	205.4	20.54	4.108	1.027		0.1027	0.2054	0.5135	1.027	0.1027	0.2054	0.5135	1.027	0.1027	0.2054	0.5135	1.027	0.1027	0.2054	0.5135	1.027
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054		0.1054	0.2108	0.5270	1.054	0.1054	0.2108	0.5270	1.054	0.1054	0.2108	0.5270	1.054	0.1054	0.2108	0.5270	1.054
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081		0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166		0.2166	0.4332	1.0830	2.166	0.2166	0.4332	1.0830	2.166	0.2166	0.4332	1.0830	2.166	0.2166	0.4332	1.0830	2.166
n-Hexane	1.082	216.4	21.64	4.328	1.082		0.1082	0.2164	0.5410	1.082	0.1082	0.2164	0.5410	1.082	0.1082	0.2164	0.5410	1.082	0.1082	0.2164	0.5410	1.082
Chloroform	1.077	215.4	21.54	4.308	1.077		0.1077	0.2154	0.5385	1.077	0.1077	0.2154	0.5385	1.077	0.1077	0.2154	0.5385	1.077	0.1077	0.2154	0.5385	1.077
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068		0.1068	0.2136	0.5340	1.068	0.1068	0.2136	0.5340	1.068	0.1068	0.2136	0.5340	1.068	0.1068	0.2136	0.5340	1.068
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060		0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060	0.1060	0.2120	0.5300	1.060
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061		0.1061	0.2122	0.5305	1.061	0.1061	0.2122	0.5305	1.061	0.1061	0.2122	0.5305	1.061	0.1061	0.2122	0.5305	1.061
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081		0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081	0.1081	0.2162	0.5405	1.081
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066		0.2066	0.4132	1.0330	2.066	0.2066	0.4132	1.0330	2.066	0.2066	0.4132	1.0330	2.066	0.2066	0.4132	1.0330	2.066
1-Butanol	2.067	413.4	41.34	8.268	2.067		0.2067	0.4134	1.0335	2.067	0.2067	0.4134	1.0335	2.067	0.2067	0.4134	1.0335	2.067	0.2067	0.4134	1.0335	2.067
Benzene	1.033	206.6	20.66	4.132	1.033		0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033	0.1033	0.2066	0.5165	1.033
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036		0.1036	0.2072	0.5180	1.036	0.1036	0.2072	0.5180	1.036	0.1036	0.2072	0.5180	1.036	0.1036	0.2072	0.5180	1.036
Cyclohexane	2.087	417.4	41.74	8.348	2.087		0.2087	0.4174	1.0435	2.087	0.2087	0.4174	1.0435	2.087	0.2087	0.4174	1.0435	2.087	0.2087	0.4174	1.0435	2.087
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074		0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074	0.1074	0.2148	0.5370	1.074
1,2-Dichloropropane	1.073	214.6																				

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-03201908
20ng/L Std. ID: S31-03201907
200ng/L Std. ID: S31-03181909

200ng/L Std. ID: S31-03181909														
Dilution Factors:			5	50	250	1000	Working STD Conc.(ng/L):							
Compounds	Source Std. mg/m³	Primary Working Standards					4	4	4	20	20	200	200	200
		200ng/L	20ng/L	4ng/L	1ng/L									
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120	0.1120	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0	112.0
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0	106.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055	0.1055	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5	105.5
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6	107.6
Toluene	1.052	210.4	21.04	4.208	1.052	0.1052	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2	105.2
2-Hexanone	1.074	214.8	21.48	4.296	1.074	0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4	107.4
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075	0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5	107.5
1,1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6	107.6
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085	0.1085	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5	108.5
n-Octane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6	107.6
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8	105.8
Chlorobenzene	1.066	213.2	21.32	4.264	1.066	0.1066	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6	106.6
Ethylbenzene	1.033	206.6	20.66	4.132	1.033	0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3	103.3
m- & p-Xylene	2.123	424.6	42.46	8.492	2.123	0.2123	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3	106.3
Styrene	1.060	212.0	21.20	4.240	1.060	0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0	106.0
o-Xylene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2	106.2
n-Nonane	1.071	214.2	21.42	4.284	1.071	0.1071	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1	107.1
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4	106.4
Cumene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7	105.7
alpha-Phene	1.035	207.0	20.70	4.140	1.035	0.1035	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5	103.5
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6	107.6
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2	106.2
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061	0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1	106.1
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7	105.7
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058	0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8	105.8
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072	0.1072	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2	107.2
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068	0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8	106.8
n-Decane	1.076	215.2	21.52	4.304	1.076	0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6	107.6
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051	0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1	105.1
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080	0.1080	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0	108.0
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081	0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1	108.1
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063	0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3	106.3
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	104.2
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	104.2
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089	0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9	108.9
d-Limonene	1.010	202.0	20.20	4.040	1.010	0.1010	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0	101.0
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042	0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2	104.2
n-Undecane	1.057	211.4	21.14	4.228	1.057	0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7	105.7
1,1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4	106.4
Naphthalene	1.025	205.0	20.50	4.100	1.025	0.1025	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5	102.5
n-Dodecane	1.031	206.2	20.62	4.124	1.031	0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1	103.1
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053	0.1053	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3	105.3
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041	0.1041	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1	104.1
Cyclohexanone	0.982	196.4	19.64	3.928	0.982	0.0982	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2	98.2
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067	0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7	106.7
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064	0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4	106.4

Method : I:\MS16\METHODS\R16032219.M (RTE Integrator)
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Fri Mar 22 11:09:04 2019
 Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS16\DATA\2019_03\22\03221902.D
2	0.2	0	13	I:\MS16\DATA\2019_03\22\03221903.D
3	0.5	1	13	I:\MS16\DATA\2019_03\22\03221904.D
4	1.0	1	13	I:\MS16\DATA\2019_03\22\03221905.D
5	5.0	5	13	I:\MS16\DATA\2019_03\22\03221906.D
6	25	26	13	I:\MS16\DATA\2019_03\22\03221907.D
7	50	52	13	I:\MS16\DATA\2019_03\22\03221908.D
8	100	103	13	I:\MS16\DATA\2019_03\22\03221909.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Mar 22 10:58 2019	Mar 22 10:54 2019	22 Mar 2019 1:57
2	0.2	Mar 22 10:58 2019	Mar 22 10:54 2019	22 Mar 2019 2:30
3	0.5	Mar 22 10:59 2019	Mar 22 10:54 2019	22 Mar 2019 3:04
4	1.0	Mar 22 10:59 2019	Mar 22 10:55 2019	22 Mar 2019 3:37
5	5.0	Mar 22 10:59 2019	Mar 22 10:55 2019	22 Mar 2019 4:10
6	25	Mar 22 10:59 2019	Mar 22 10:55 2019	22 Mar 2019 4:43
7	50	Mar 22 10:59 2019	Mar 22 10:55 2019	22 Mar 2019 5:16
8	100	Mar 22 10:59 2019	Mar 22 10:55 2019	22 Mar 2019 5:50

R16032219.M

Mon Mar 25 12:10:18 2019

LH 3/25/19

Data File: I:\MS16\DATA\2019 03\22\03221902.D

Acq On : 22 Mar 2019 1:57

Operator: LH

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:52 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	249815	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.43	114	1064446	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	424861	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	308151	12.800	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%
57) Toluene-d8 (SS2)	15.87	98	994974	12.725	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.84%
73) Bromofluorobenzene (SS3)	19.09	174	411816	12.813	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.48%

Target Compounds

						Qvalue
2) Propene	4.09	42	2488	0.099	ng	90
3) Dichlorodifluoromethan...	4.25	85	5271	0.112	ng	97
4) Chloromethane	4.56	50	3894	0.100	ng	89
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	3483	0.119	ng	93
6) Vinyl Chloride	5.01	62	3777	0.102	ng	97
7) 1,3-Butadiene	5.28	54	2633	0.103	ng	97
8) Bromomethane	5.75	94	2398	0.105	ng	95
9) Chloroethane	6.08	64	1843	0.108	ng	87
10) Ethanol	6.46	45	8514	0.449	ng	87
11) Acetonitrile	6.80	41	4201	0.099	ng	# 19
12) Acrolein	6.95	56	987	0.068	ng	# 51
13) Acetone	7.15	58	11042	0.620	ng	95
14) Trichlorofluoromethane	7.37	101	4678	0.118	ng	99
15) 2-Propanol (Isopropanol)	7.71	45	10794	0.181	ng	98
16) Acrylonitrile	7.99	53	1779	0.059	ng	# 62
17) 1,1-Dichloroethene	8.36	96	2671	0.112	ng	97
18) 2-Methyl-2-Propanol (t...	8.59	59	11472	0.202	ng	93
19) Methylene Chloride	8.58	84	2926	0.119	ng	99
20) 3-Chloro-1-propene (Al...	8.75	41	3219	0.106	ng	83
21) Trichlorotrifluoroethane	8.99	151	3063	0.125	ng	99
22) Carbon Disulfide	8.87	76	11235	0.120	ng	91
23) trans-1,2-Dichloroethene	9.88	61	3100	0.096	ng	92
24) 1,1-Dichloroethane	10.12	63	4383	0.108	ng	95
25) Methyl tert-Butyl Ether	10.25	73	7419	0.111	ng	98
26) Vinyl Acetate	10.40	86	2011	0.396	ng	# 32
27) 2-Butanone (MEK)	10.71	72	1391	0.080	ng	# 65
28) cis-1,2-Dichloroethene	11.15	61	3420	0.108	ng	99
29) Diisopropyl Ether	11.44	87	2717	0.134	ng	# 1
30) Ethyl Acetate	11.47	61	1568	0.174	ng	# 75
31) n-Hexane	11.42	57	4367	0.118	ng	96
32) Chloroform	11.48	83	4565	0.113	ng	98
34) Tetrahydrofuran (THF)	11.94	72	1876	0.105	ng	# 84
35) Ethyl tert-Butyl Ether	12.03	87	3061	0.111	ng	100
36) 1,2-Dichloroethane	12.30	62	3086	0.113	ng	92
38) 1,1,1-Trichloroethane	12.56	97	3888	0.112	ng	97
39) Isopropyl Acetate	13.00	61	3113	0.178	ng	# 96
40) 1-Butanol	13.08	56	2823	0.124	ng	# 77
41) Benzene	13.04	78	13886	0.132	ng	98
42) Carbon Tetrachloride	13.20	117	3515	0.111	ng	96
43) Cyclohexane	13.32	84	8477	0.224	ng	96
44) tert-Amyl Methyl Ether	13.68	73	7352	0.111	ng	96
45) 1,2-Dichloropropane	13.90	63	2674	0.111	ng	97
46) Bromodichloromethane	14.09	83	3400	0.108	ng	98
47) Trichloroethene	14.13	130	3967	0.135	ng	99
48) 1,4-Dioxane	14.15	88	2203	0.099	ng	74
49) 2,2,4-Trimethylpentane...	14.19	57	11414	0.115	ng	98

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Data File: I:\MS16\DATA\2019 03\22\03221902.D

Acq On : 22 Mar 2019 1:57

Operator: LH

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:52 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.35	100	1730	0.163	ng	# 87
51) n-Heptane	14.45	71	2711	0.118	ng	96
52) cis-1,3-Dichloropropene	15.01	75	3854	0.104	ng	92
53) 4-Methyl-2-pentanone	15.06	58	1716	0.072	ng	# 73
54) trans-1,3-Dichloropropene	15.52	75	2682	0.085	ng	87
55) 1,1,2-Trichloroethane	15.70	97	2865	0.116	ng	94
58) Toluene	15.98	91	12112	0.120	ng	97
59) 2-Hexanone	16.27	43	3569	0.071	ng	100
60) Dibromochloromethane	16.39	129	3058	0.109	ng	94
61) 1,2-Dibromoethane	16.65	107	2923	0.106	ng	92
62) n-Butyl Acetate	16.87	43	3770	0.068	ng	96
63) n-Octane	16.95	57	2114	0.112	ng	97
64) Tetrachloroethene	17.11	166	4006	0.127	ng	93
65) Chlorobenzene	17.76	112	8652	0.123	ng	99
66) Ethylbenzene	18.11	91	13284	0.117	ng	96
67) m- & p-Xylenes	18.27	91	19751	0.233	ng	99
68) Bromoform	18.35	173	2598	0.101	ng	99
69) Styrene	18.60	104	7305	0.106	ng	95
70) o-Xylene	18.69	91	10057	0.117	ng	95
71) n-Nonane	18.87	43	4656	0.114	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	4727	0.109	ng	99
74) Cumene	19.20	105	13978	0.121	ng	97
75) alpha-Pinene	19.54	93	6406	0.113	ng	97
76) n-Propylbenzene	19.65	91	15844	0.119	ng	98
77) 3-Ethyltoluene	19.73	105	13496	0.121	ng	98
78) 4-Ethyltoluene	19.77	105	12247	0.116	ng	97
79) 1,3,5-Trimethylbenzene	19.84	105	11826	0.126	ng	94
80) alpha-Methylstyrene	19.97	118	4977	0.101	ng	94
81) 2-Ethyltoluene	20.00	105	13439	0.120	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	10782	0.117	ng	99
83) n-Decane	20.26	57	5234	0.117	ng	94
84) Benzyl Chloride	20.31	91	4680	0.073	ng	88
85) 1,3-Dichlorobenzene	20.33	146	7120	0.122	ng	100
86) 1,4-Dichlorobenzene	20.39	146	7786	0.129	ng	97
87) sec-Butylbenzene	20.42	105	14859	0.120	ng	95
88) 4-Isopropyltoluene (p-...	20.56	119	13478	0.116	ng	98
89) 1,2,3-Trimethylbenzene	20.56	105	10837	0.118	ng	100
90) 1,2-Dichlorobenzene	20.69	146	7109	0.127	ng	96
91) d-Limonene	20.68	68	3292	0.100	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.07	157	1523	0.070	ng	# 76
93) n-Undecane	21.35	57	4813	0.105	ng	97
94) 1,2,4-Trichlorobenzene	22.18	180	5206	0.116	ng	# 94
95) Naphthalene	22.30	128	14763	0.105	ng	90
96) n-Dodecane	22.26	57	4541	0.118	ng	93
97) Hexachlorobutadiene	22.59	225	4332	0.141	ng	98
98) Cyclohexanone	18.43	55	2958	0.087	ng	94
99) tert-Butylbenzene	20.19	119	11108	0.122	ng	99
100) n-Butylbenzene	20.92	91	10726	0.109	ng	95

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

Data File: I:\MS16\DATA\2019 03\22\03221902.D

Acq On : 22 Mar 2019 1:57

Operator: LH

Sample : 0.1ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:52 2019

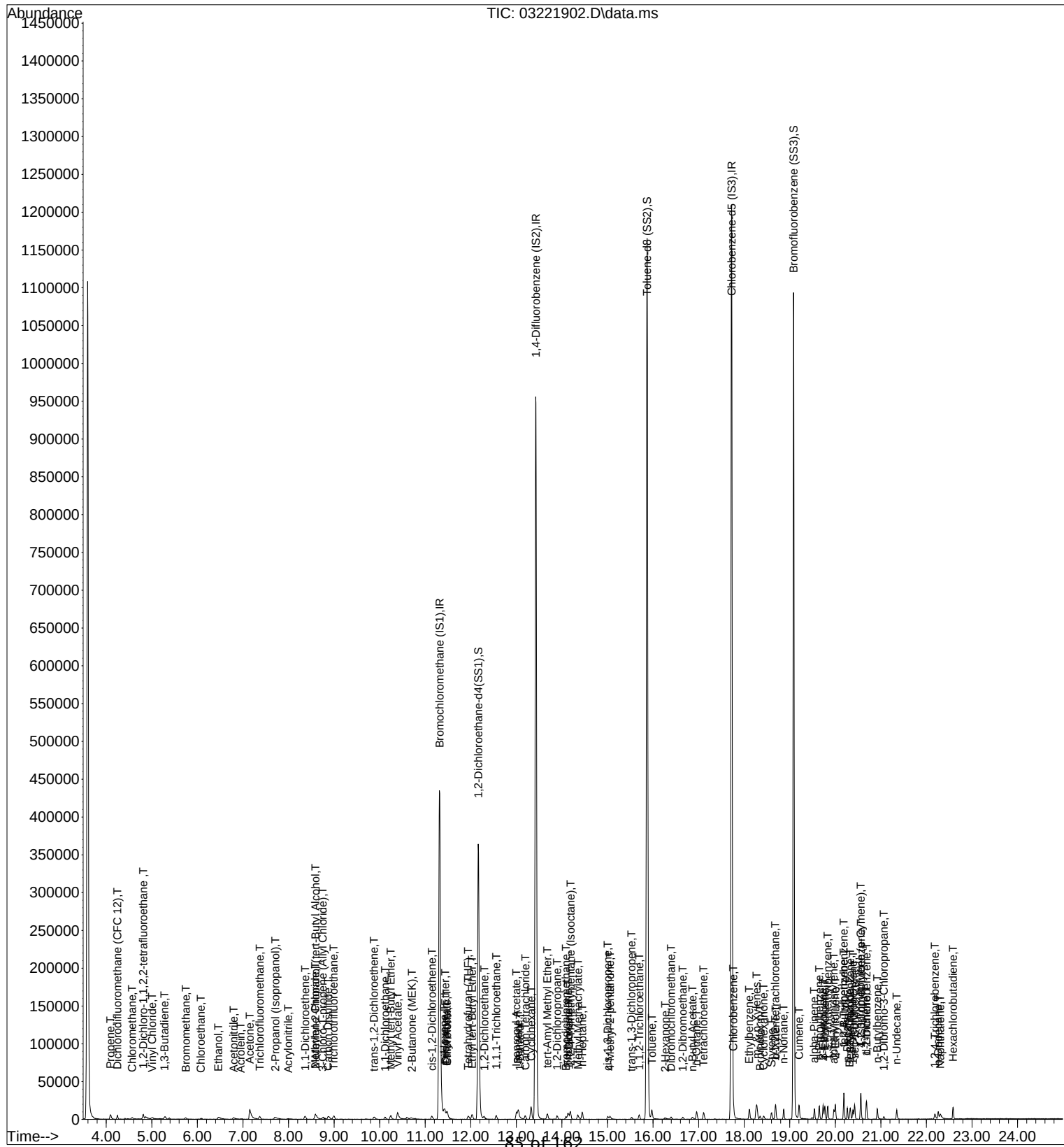
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221903.D

Acq On : 22 Mar 2019 2:30

Operator: LH

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:55 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/22/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	247582	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.43	114	1039124	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	418945	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	300684	12.602	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.80%
57) Toluene-d8 (SS2)	15.87	98	975080	12.647	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%
73) Bromofluorobenzene (SS3)	19.09	174	409988	12.936	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.52%

Target Compounds

						Qvalue
2) Propene	4.09	42	4365	0.175	ng	94
3) Dichlorodifluoromethan...	4.24	85	9652	0.207	ng	98
4) Chloromethane	4.55	50	7680	0.199	ng	94
5) 1,2-Dichloro-1,1,2,2-t...	4.81	135	6270	0.216	ng	98
6) Vinyl Chloride	4.99	62	7086	0.193	ng	99
7) 1,3-Butadiene	5.27	54	4548	0.180	ng	96
8) Bromomethane	5.74	94	4452	0.196	ng	97
9) Chloroethane	6.08	64	3125	0.185	ng	95
10) Ethanol	6.44	45	15920	0.847	ng	91
11) Acetonitrile	6.76	41	7595	0.180	ng	# 50
12) Acrolein	6.95	56	1995	0.139	ng	99
13) Acetone	7.13	58	19252	1.090	ng	94
14) Trichlorofluoromethane	7.36	101	8498	0.216	ng	98
15) 2-Propanol (Isopropanol)	7.68	45	20772	0.351	ng	92
16) Acrylonitrile	7.98	53	4314	0.144	ng	96
17) 1,1-Dichloroethene	8.36	96	4962	0.210	ng	100
18) 2-Methyl-2-Propanol (t...	8.58	59	21489	0.382	ng	97
19) Methylene Chloride	8.58	84	5103	0.210	ng	96
20) 3-Chloro-1-propene (Al...	8.75	41	5784	0.193	ng	86
21) Trichlorotrifluoroethane	9.00	151	5409	0.223	ng	100
22) Carbon Disulfide	8.88	76	18992	0.205	ng	97
23) trans-1,2-Dichloroethene	9.88	61	6161	0.192	ng	97
24) 1,1-Dichloroethane	10.12	63	7926	0.197	ng	93
25) Methyl tert-Butyl Ether	10.23	73	14095	0.214	ng	97
26) Vinyl Acetate	10.38	86	4306	0.856	ng	# 56
27) 2-Butanone (MEK)	10.66	72	2569	0.150	ng	# 74
28) cis-1,2-Dichloroethene	11.14	61	6281	0.200	ng	98
29) Diisopropyl Ether	11.43	87	4769	0.238	ng	# 74
30) Ethyl Acetate	11.46	61	3053	0.342	ng	96
31) n-Hexane	11.41	57	7516	0.205	ng	97
32) Chloroform	11.48	83	8484	0.212	ng	99
34) Tetrahydrofuran (THF)	11.93	72	2980	0.168	ng	# 86
35) Ethyl tert-Butyl Ether	12.03	87	5539	0.202	ng	97
36) 1,2-Dichloroethane	12.29	62	5485	0.202	ng	97
38) 1,1,1-Trichloroethane	12.56	97	7183	0.212	ng	98
39) Isopropyl Acetate	12.99	61	5746	0.337	ng	# 94
40) 1-Butanol	13.06	56	6188	0.279	ng	80
41) Benzene	13.04	78	22930	0.224	ng	99
42) Carbon Tetrachloride	13.20	117	6266	0.203	ng	99
43) Cyclohexane	13.32	84	15003	0.406	ng	95
44) tert-Amyl Methyl Ether	13.68	73	13030	0.201	ng	96
45) 1,2-Dichloropropane	13.90	63	4801	0.204	ng	96
46) Bromodichloromethane	14.08	83	6035	0.197	ng	99
47) Trichloroethene	14.13	130	6490	0.225	ng	100
48) 1,4-Dioxane	14.14	88	3748	0.173	ng	# 63
49) 2,2,4-Trimethylpentane...	14.19	57	20443	0.212	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221903.D

Acq On : 22 Mar 2019 2:30

Operator: LH

Sample : 0.2ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:55 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	3529	0.340	ng	# 83
51) n-Heptane	14.45	71	4409	0.197	ng	93
52) cis-1,3-Dichloropropene	15.01	75	7171	0.197	ng	97
53) 4-Methyl-2-pentanone	15.05	58	3579	0.154	ng	83
54) trans-1,3-Dichloropropene	15.52	75	5088	0.165	ng	100
55) 1,1,2-Trichloroethane	15.69	97	4821	0.201	ng	97
58) Toluene	15.98	91	21133	0.212	ng	97
59) 2-Hexanone	16.24	43	7422	0.149	ng	96
60) Dibromochloromethane	16.40	129	5622	0.203	ng	100
61) 1,2-Dibromoethane	16.65	107	5364	0.198	ng	96
62) n-Butyl Acetate	16.85	43	7735	0.142	ng	96
63) n-Octane	16.95	57	3907	0.210	ng	94
64) Tetrachloroethene	17.11	166	7003	0.224	ng	98
65) Chlorobenzene	17.76	112	15112	0.218	ng	100
66) Ethylbenzene	18.11	91	22355	0.199	ng	99
67) m- & p-Xylenes	18.27	91	35050	0.420	ng	99
68) Bromoform	18.35	173	4879	0.192	ng	97
69) Styrene	18.60	104	12767	0.188	ng	99
70) o-Xylene	18.69	91	17838	0.210	ng	98
71) n-Nonane	18.87	43	8663	0.215	ng	93
72) 1,1,2,2-Tetrachloroethane	18.68	83	8459	0.198	ng	100
74) Cumene	19.20	105	23211	0.204	ng	99
75) alpha-Pinene	19.54	93	11184	0.200	ng	89
76) n-Propylbenzene	19.64	91	27903	0.213	ng	97
77) 3-Ethyltoluene	19.73	105	22277	0.202	ng	99
78) 4-Ethyltoluene	19.77	105	22788	0.218	ng	94
79) 1,3,5-Trimethylbenzene	19.83	105	20212	0.219	ng	98
80) alpha-Methylstyrene	19.97	118	9473	0.196	ng	99
81) 2-Ethyltoluene	20.00	105	24054	0.218	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	19404	0.213	ng	100
83) n-Decane	20.26	57	9647	0.218	ng	96
84) Benzyl Chloride	20.31	91	8701	0.138	ng	91
85) 1,3-Dichlorobenzene	20.33	146	13023	0.226	ng	99
86) 1,4-Dichlorobenzene	20.39	146	13605	0.229	ng	99
87) sec-Butylbenzene	20.42	105	27288	0.223	ng	98
88) 4-Isopropyltoluene (p-...	20.56	119	24374	0.212	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	19987	0.222	ng	98
90) 1,2-Dichlorobenzene	20.68	146	13021	0.236	ng	98
91) d-Limonene	20.68	68	5970	0.183	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.07	157	3714	0.172	ng	96
93) n-Undecane	21.34	57	9614	0.213	ng	95
94) 1,2,4-Trichlorobenzene	22.17	180	9220	0.208	ng	98
95) Naphthalene	22.29	128	24786	0.179	ng	94
96) n-Dodecane	22.25	57	8241	0.217	ng	91
97) Hexachlorobutadiene	22.58	225	6965	0.229	ng	96
98) Cyclohexanone	18.42	55	5752	0.171	ng	94
99) tert-Butylbenzene	20.19	119	20462	0.228	ng	98
100) n-Butylbenzene	20.92	91	20299	0.209	ng	95

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

Data File: I:\MS16\DATA\2019 03\22\03221904.D

Acq On : 22 Mar 2019 3:04

Operator: LH

Sample : 0.5ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:58 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	225329	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.42	114	956338	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	384816	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	278237	12.813	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.48%
57) Toluene-d8 (SS2)	15.87	98	894838	12.636	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.12%
73) Bromofluorobenzene (SS3)	19.09	174	381277	13.097	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.80%

Target Compounds

						Qvalue
2) Propene	4.08	42	10036	0.442	ng	97
3) Dichlorodifluoromethan...	4.23	85	21607	0.508	ng	99
4) Chloromethane	4.54	50	17248	0.491	ng	97
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	13340	0.505	ng	99
6) Vinyl Chloride	4.98	62	16841	0.505	ng	98
7) 1,3-Butadiene	5.25	54	10857	0.473	ng	98
8) Bromomethane	5.72	94	10343	0.500	ng	99
9) Chloroethane	6.06	64	7072	0.459	ng	98
10) Ethanol	6.42	45	35069	2.051	ng	99
11) Acetonitrile	6.73	41	17466	0.454	ng	78
12) Acrolein	6.92	56	6026	0.462	ng	96
13) Acetone	7.11	58	43925	2.732	ng	93
14) Trichlorofluoromethane	7.36	101	19053	0.533	ng	99
15) 2-Propanol (Isopropanol)	7.63	45	47087	0.875	ng	92
16) Acrylonitrile	7.92	53	11607	0.426	ng	99
17) 1,1-Dichloroethene	8.35	96	11283	0.526	ng	100
18) 2-Methyl-2-Propanol (t...	8.54	59	49692	0.971	ng	97
19) Methylene Chloride	8.57	84	11502	0.521	ng	98
20) 3-Chloro-1-propene (Al...	8.74	41	13341	0.488	ng	93
21) Trichlorotrifluoroethane	8.99	151	12288	0.557	ng	98
22) Carbon Disulfide	8.86	76	41572	0.494	ng	99
23) trans-1,2-Dichloroethene	9.87	61	14756	0.506	ng	99
24) 1,1-Dichloroethane	10.11	63	18221	0.498	ng	97
25) Methyl tert-Butyl Ether	10.22	73	31786	0.529	ng	99
26) Vinyl Acetate	10.37	86	10683	2.332	ng	# 70
27) 2-Butanone (MEK)	10.64	72	7178	0.460	ng	95
28) cis-1,2-Dichloroethene	11.14	61	14304	0.500	ng	100
29) Diisopropyl Ether	11.42	87	8906	0.488	ng	# 86
30) Ethyl Acetate	11.44	61	7676	0.944	ng	94
31) n-Hexane	11.41	57	17727	0.531	ng	99
32) Chloroform	11.48	83	19391	0.532	ng	98
34) Tetrahydrofuran (THF)	11.91	72	7116	0.441	ng	# 90
35) Ethyl tert-Butyl Ether	12.02	87	12865	0.516	ng	99
36) 1,2-Dichloroethane	12.29	62	13162	0.533	ng	100
38) 1,1,1-Trichloroethane	12.55	97	16960	0.543	ng	99
39) Isopropyl Acetate	12.99	61	13574	0.866	ng	# 98
40) 1-Butanol	13.04	56	16718	0.818	ng	# 77
41) Benzene	13.04	78	48630	0.516	ng	99
42) Carbon Tetrachloride	13.19	117	14456	0.508	ng	99
43) Cyclohexane	13.32	84	35159	1.034	ng	98
44) tert-Amyl Methyl Ether	13.67	73	29754	0.499	ng	95
45) 1,2-Dichloropropane	13.89	63	10916	0.505	ng	99
46) Bromodichloromethane	14.09	83	14455	0.512	ng	100
47) Trichloroethene	14.13	130	14300	0.540	ng	100
48) 1,4-Dioxane	14.13	88	9167	0.460	ng	# 68
49) 2,2,4-Trimethylpentane...	14.18	57	45462	0.512	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221904.D

Acq On : 22 Mar 2019 3:04

Operator: LH

Sample : 0.5ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201908 (4/18)

ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 22 10:54:58 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

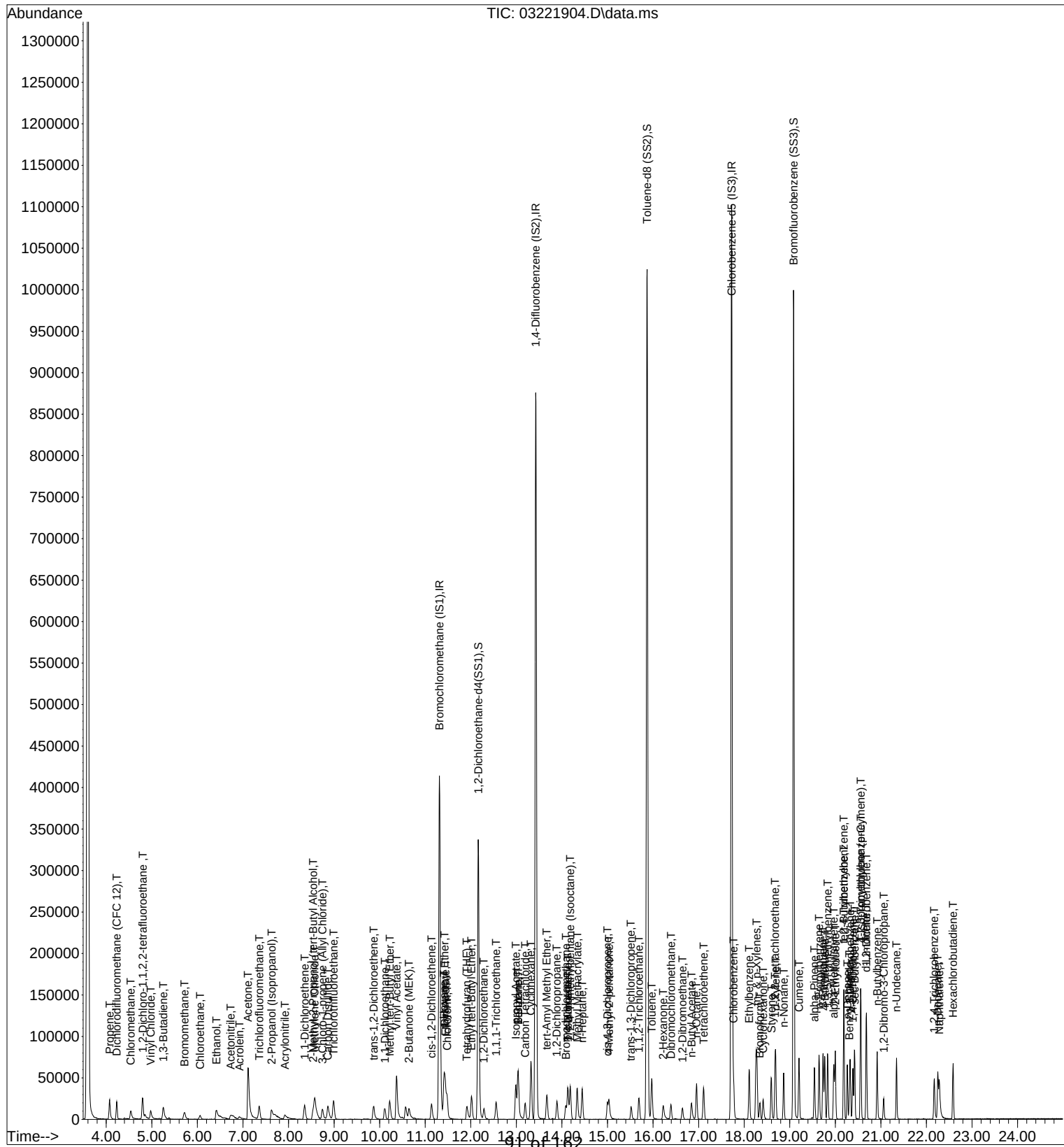
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	8903	0.931	ng	95
51) n-Heptane	14.45	71	10840	0.526	ng	97
52) cis-1,3-Dichloropropene	15.00	75	17151	0.513	ng	99
53) 4-Methyl-2-pentanone	15.03	58	9112	0.427	ng	95
54) trans-1,3-Dichloropropene	15.51	75	13350	0.470	ng	95
55) 1,1,2-Trichloroethane	15.69	97	11586	0.524	ng	99
58) Toluene	15.97	91	47824	0.522	ng	99
59) 2-Hexanone	16.22	43	20622	0.451	ng	93
60) Dibromochloromethane	16.39	129	13187	0.517	ng	99
61) 1,2-Dibromoethane	16.65	107	12831	0.515	ng	98
62) n-Butyl Acetate	16.84	43	20769	0.414	ng	98
63) n-Octane	16.95	57	9217	0.540	ng	94
64) Tetrachloroethene	17.11	166	15961	0.557	ng	100
65) Chlorobenzene	17.76	112	34050	0.535	ng	99
66) Ethylbenzene	18.11	91	52962	0.514	ng	99
67) m- & p-Xylenes	18.27	91	81567	1.064	ng	99
68) Bromoform	18.34	173	11675	0.500	ng	99
69) Styrene	18.60	104	31923	0.511	ng	99
70) o-Xylene	18.69	91	41484	0.532	ng	99
71) n-Nonane	18.87	43	19949	0.540	ng	97
72) 1,1,2,2-Tetrachloroethane	18.68	83	20699	0.527	ng	99
74) Cumene	19.20	105	54909	0.526	ng	99
75) alpha-Pinene	19.54	93	27059	0.527	ng	93
76) n-Propylbenzene	19.64	91	64846	0.539	ng	99
77) 3-Ethyltoluene	19.73	105	54329	0.538	ng	99
78) 4-Ethyltoluene	19.77	105	52903	0.551	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	45947	0.541	ng	100
80) alpha-Methylstyrene	19.97	118	23598	0.530	ng	98
81) 2-Ethyltoluene	20.00	105	56558	0.559	ng	97
82) 1,2,4-Trimethylbenzene	20.19	105	45389	0.542	ng	98
83) n-Decane	20.26	57	22813	0.562	ng	97
84) Benzyl Chloride	20.31	91	22786	0.395	ng	95
85) 1,3-Dichlorobenzene	20.32	146	30984	0.585	ng	99
86) 1,4-Dichlorobenzene	20.39	146	31389	0.575	ng	100
87) sec-Butylbenzene	20.42	105	62675	0.557	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	58230	0.553	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	45774	0.552	ng	100
90) 1,2-Dichlorobenzene	20.68	146	30068	0.594	ng	99
91) d-Limonene	20.68	68	15814	0.529	ng	97
92) 1,2-Dibromo-3-Chloropr...	21.06	157	9475	0.477	ng	96
93) n-Undecane	21.34	57	23709	0.571	ng	97
94) 1,2,4-Trichlorobenzene	22.17	180	23067	0.566	ng	98
95) Naphthalene	22.28	128	65632	0.517	ng	99
96) n-Dodecane	22.25	57	21163	0.606	ng	98
97) Hexachlorobutadiene	22.59	225	15854	0.568	ng	98
98) Cyclohexanone	18.42	55	13386	0.433	ng	98
99) tert-Butylbenzene	20.19	119	46805	0.567	ng	100
100) n-Butylbenzene	20.92	91	49177	0.552	ng	97

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

ALS Vial : 5 Sample Multiplier: 1

DataAcq Meth:T015.M



Data File: I:\MS16\DATA\2019 03\22\03221905.D

Acq On : 22 Mar 2019 3:37

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201907 (4/18)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 22 10:55:01 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.31	130	226460	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	962109	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	386040	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.16	65	279470	12.806	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.48%
57) Toluene-d8 (SS2)	15.87	98	898724	12.650	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.20%
73) Bromofluorobenzene (SS3)	19.08	174	384843	13.178	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	105.44%

Target Compounds

						Qvalue
2) Propene	4.06	42	22376	0.980	ng	99
3) Dichlorodifluoromethan...	4.22	85	41512	0.971	ng	99
4) Chloromethane	4.53	50	32251	0.914	ng	96
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	26917	1.014	ng	99
6) Vinyl Chloride	4.97	62	32399	0.966	ng	99
7) 1,3-Butadiene	5.24	54	21962	0.951	ng	98
8) Bromomethane	5.71	94	19601	0.944	ng	100
9) Chloroethane	6.05	64	14591	0.942	ng	97
10) Ethanol	6.41	45	67274	3.914	ng	100
11) Acetonitrile	6.72	41	34267	0.887	ng	88
12) Acrolein	6.91	56	12228	0.932	ng	100
13) Acetone	7.11	58	81971	5.073	ng	97
14) Trichlorofluoromethane	7.36	101	36863	1.025	ng	99
15) 2-Propanol (Isopropanol)	7.62	45	87846	1.625	ng	93
16) Acrylonitrile	7.90	53	24326	0.888	ng	99
17) 1,1-Dichloroethene	8.35	96	21599	1.001	ng	100
18) 2-Methyl-2-Propanol (t...	8.51	59	95563	1.858	ng	98
19) Methylene Chloride	8.57	84	22233	1.002	ng	98
20) 3-Chloro-1-propene (Al...	8.74	41	25730	0.937	ng	93
21) Trichlorotrifluoroethane	8.99	151	22840	1.031	ng	97
22) Carbon Disulfide	8.86	76	79629	0.942	ng	100
23) trans-1,2-Dichloroethene	9.86	61	28837	0.984	ng	98
24) 1,1-Dichloroethane	10.11	63	35571	0.967	ng	98
25) Methyl tert-Butyl Ether	10.21	73	61115	1.012	ng	99
26) Vinyl Acetate	10.37	86	21581	4.688	ng	# 80
27) 2-Butanone (MEK)	10.63	72	14070	0.898	ng	# 90
28) cis-1,2-Dichloroethene	11.14	61	28047	0.976	ng	98
29) Diisopropyl Ether	11.42	87	18359	1.001	ng	98
30) Ethyl Acetate	11.44	61	15275	1.869	ng	100
31) n-Hexane	11.41	57	34642	1.032	ng	99
32) Chloroform	11.48	83	37194	1.016	ng	100
34) Tetrahydrofuran (THF)	11.91	72	14092	0.870	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	25053	1.000	ng	98
36) 1,2-Dichloroethane	12.29	62	25214	1.017	ng	100
38) 1,1,1-Trichloroethane	12.55	97	32657	1.040	ng	100
39) Isopropyl Acetate	12.98	61	26898	1.705	ng	# 100
40) 1-Butanol	13.02	56	36854	1.793	ng	# 74
41) Benzene	13.04	78	89273	0.941	ng	99
42) Carbon Tetrachloride	13.20	117	28034	0.979	ng	99
43) Cyclohexane	13.32	84	67198	1.964	ng	97
44) tert-Amyl Methyl Ether	13.67	73	58169	0.969	ng	98
45) 1,2-Dichloropropane	13.89	63	20856	0.958	ng	99
46) Bromodichloromethane	14.08	83	27816	0.979	ng	99
47) Trichloroethene	14.13	130	27637	1.037	ng	99
48) 1,4-Dioxane	14.12	88	18036	0.899	ng	99
49) 2,2,4-Trimethylpentane...	14.18	57	85540	0.957	ng	99

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Data File: I:\MS16\DATA\2019 03\22\03221905.D

Acq On : 22 Mar 2019 3:37

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201907 (4/18)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 22 10:55:01 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	17681	1.838	ng	94
51) n-Heptane	14.45	71	21227	1.024	ng	98
52) cis-1,3-Dichloropropene	15.00	75	34671	1.030	ng	99
53) 4-Methyl-2-pentanone	15.03	58	18292	0.852	ng	93
54) trans-1,3-Dichloropropene	15.51	75	27291	0.954	ng	99
55) 1,1,2-Trichloroethane	15.69	97	22556	1.013	ng	100
58) Toluene	15.97	91	91060	0.991	ng	100
59) 2-Hexanone	16.21	43	41212	0.899	ng	97
60) Dibromochloromethane	16.39	129	26462	1.035	ng	99
61) 1,2-Dibromoethane	16.64	107	26028	1.042	ng	99
62) n-Butyl Acetate	16.84	43	43907	0.873	ng	97
63) n-Octane	16.95	57	17359	1.013	ng	98
64) Tetrachloroethene	17.11	166	30553	1.063	ng	99
65) Chlorobenzene	17.76	112	65420	1.024	ng	99
66) Ethylbenzene	18.11	91	102154	0.987	ng	98
67) m- & p-Xylenes	18.27	91	157948	2.053	ng	99
68) Bromoform	18.34	173	23282	0.995	ng	100
69) Styrene	18.59	104	64279	1.025	ng	100
70) o-Xylene	18.69	91	81452	1.041	ng	98
71) n-Nonane	18.87	43	37508	1.012	ng	98
72) 1,1,2,2-Tetrachloroethane	18.68	83	40101	1.017	ng	100
74) Cumene	19.20	105	105681	1.009	ng	99
75) alpha-Pinene	19.54	93	52339	1.016	ng	94
76) n-Propylbenzene	19.64	91	128030	1.060	ng	98
77) 3-Ethyltoluene	19.73	105	106870	1.054	ng	100
78) 4-Ethyltoluene	19.76	105	99715	1.036	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	89381	1.049	ng	98
80) alpha-Methylstyrene	19.97	118	47927	1.074	ng	98
81) 2-Ethyltoluene	20.00	105	107199	1.056	ng	99
82) 1,2,4-Trimethylbenzene	20.19	105	90265	1.074	ng	99
83) n-Decane	20.26	57	44652	1.096	ng	98
84) Benzyl Chloride	20.31	91	50918	0.879	ng	97
85) 1,3-Dichlorobenzene	20.33	146	59321	1.117	ng	100
86) 1,4-Dichlorobenzene	20.39	146	60791	1.109	ng	99
87) sec-Butylbenzene	20.42	105	122580	1.087	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	114044	1.079	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	88728	1.067	ng	100
90) 1,2-Dichlorobenzene	20.68	146	57988	1.142	ng	99
91) d-Limonene	20.68	68	31391	1.046	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	19400	0.974	ng	94
93) n-Undecane	21.34	57	46407	1.113	ng	97
94) 1,2,4-Trichlorobenzene	22.17	180	46025	1.126	ng	99
95) Naphthalene	22.28	128	133153	1.045	ng	98
96) n-Dodecane	22.24	57	44491	1.269	ng	99
97) Hexachlorobutadiene	22.58	225	31461	1.123	ng	99
98) Cyclohexanone	18.41	55	26568	0.856	ng	99
99) tert-Butylbenzene	20.19	119	88870	1.073	ng	100
100) n-Butylbenzene	20.92	91	95045	1.064	ng	99

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

Data File: I:\MS16\DATA\2019 03\22\03221905.D

Acq On : 22 Mar 2019 3:37

Operator: LH

Sample : 1.0ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201907 (4/18)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 22 10:55:01 2019

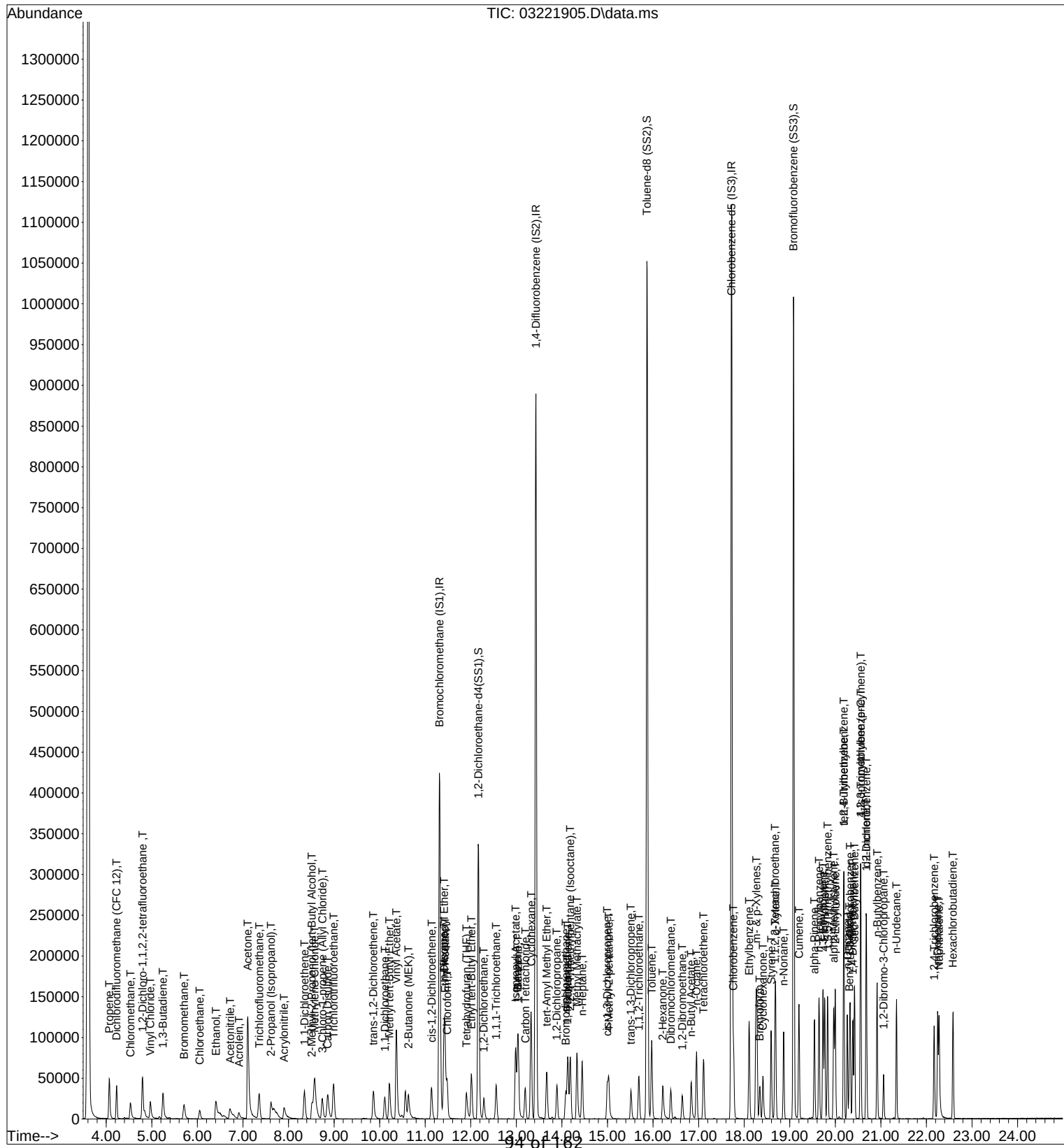
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221906.D

Acq On : 22 Mar 2019 4:10

Operator: LH

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201907 (4/18)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 22 10:55:04 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

LH 3/22/19

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	219938	12.500	ng	-0.01
37) 1,4-Difluorobenzene (IS2)	13.43	114	928440	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	372970	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	271097	12.790	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.32%
57) Toluene-d8 (SS2)	15.87	98	958576	13.966	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	111.76%
73) Bromofluorobenzene (SS3)	19.09	174	369529	13.097	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	104.80%

Target Compounds

						Qvalue
2) Propene	4.05	42	105398	4.752	ng	100
3) Dichlorodifluoromethan...	4.22	85	224207	5.403	ng	100
4) Chloromethane	4.52	50	160713	4.689	ng	99
5) 1,2-Dichloro-1,1,2,2-t...	4.79	135	134652	5.221	ng	100
6) Vinyl Chloride	4.95	62	167030	5.130	ng	99
7) 1,3-Butadiene	5.23	54	117328	5.234	ng	100
8) Bromomethane	5.70	94	103840	5.147	ng	100
9) Chloroethane	6.04	64	75123	4.996	ng	100
10) Ethanol	6.40	45	345453	20.697	ng	100
11) Acetonitrile	6.70	41	172980	4.611	ng	98
12) Acrolein	6.90	56	66198	5.197	ng	99
13) Acetone	7.09	58	389967	24.851	ng	100
14) Trichlorofluoromethane	7.35	101	189122	5.415	ng	100
15) 2-Propanol (Isopropanol)	7.59	45	496748	9.460	ng	98
16) Acrylonitrile	7.89	53	133684	5.027	ng	100
17) 1,1-Dichloroethene	8.35	96	113483	5.418	ng	100
18) 2-Methyl-2-Propanol (t...	8.50	59	520482	10.418	ng	99
19) Methylene Chloride	8.57	84	114943	5.331	ng	100
20) 3-Chloro-1-propene (Al...	8.74	41	136614	5.122	ng	97
21) Trichlorotrifluoroethane	8.99	151	118617	5.513	ng	100
22) Carbon Disulfide	8.85	76	419605	5.109	ng	100
23) trans-1,2-Dichloroethene	9.86	61	152484	5.358	ng	99
24) 1,1-Dichloroethane	10.11	63	182423	5.108	ng	100
25) Methyl tert-Butyl Ether	10.20	73	318897	5.438	ng	100
26) Vinyl Acetate	10.37	86	126601	28.316	ng	# 89
27) 2-Butanone (MEK)	10.62	72	73805	4.849	ng	99
28) cis-1,2-Dichloroethene	11.14	61	145612	5.215	ng	99
29) Diisopropyl Ether	11.42	87	90266	5.066	ng	# 95
30) Ethyl Acetate	11.43	61	80935	10.197	ng	99
31) n-Hexane	11.41	57	169786	5.207	ng	100
32) Chloroform	11.48	83	192766	5.423	ng	100
34) Tetrahydrofuran (THF)	11.89	72	73157	4.649	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	130735	5.372	ng	99
36) 1,2-Dichloroethane	12.29	62	131859	5.474	ng	99
38) 1,1,1-Trichloroethane	12.56	97	168256	5.553	ng	100
39) Isopropyl Acetate	12.98	61	137959	9.065	ng	# 99
40) 1-Butanol	13.00	56	202535	10.208	ng	98
41) Benzene	13.04	78	442754	4.837	ng	100
42) Carbon Tetrachloride	13.20	117	149042	5.394	ng	100
43) Cyclohexane	13.32	84	337944	10.234	ng	99
44) tert-Amyl Methyl Ether	13.67	73	300428	5.189	ng	99
45) 1,2-Dichloropropane	13.89	63	106379	5.065	ng	99
46) Bromodichloromethane	14.08	83	149421	5.448	ng	99
47) Trichloroethene	14.13	130	137305	5.338	ng	99
48) 1,4-Dioxane	14.11	88	91912	4.746	ng	99
49) 2,2,4-Trimethylpentane...	14.18	57	433461	5.025	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221906.D

Acq On : 22 Mar 2019 4:10

Operator: LH

Sample : 5.0ng TO-15 ICAL STD

Misc : S31-02111911/S31-03201907 (4/18)

ALS Vial : 4 Sample Multiplier: 1

Quant Time: Mar 22 10:55:04 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	95682	10.305	ng	98
51) n-Heptane	14.45	71	104963	5.245	ng	99
52) cis-1,3-Dichloropropene	14.99	75	204445	6.295	ng	99
53) 4-Methyl-2-pentanone	15.02	58	107852	5.206	ng	97
54) trans-1,3-Dichloropropene	15.51	75	174762	6.333	ng	100
55) 1,1,2-Trichloroethane	15.69	97	127003	5.913	ng	99
58) Toluene	15.97	91	503130	5.665	ng	99
59) 2-Hexanone	16.21	43	232153	5.243	ng	99
60) Dibromochloromethane	16.39	129	154365	6.248	ng	99
61) 1,2-Dibromoethane	16.64	107	146562	6.075	ng	99
62) n-Butyl Acetate	16.83	43	257474	5.299	ng	99
63) n-Octane	16.95	57	85253	5.150	ng	99
64) Tetrachloroethene	17.11	166	152360	5.485	ng	100
65) Chlorobenzene	17.77	112	331380	5.369	ng	100
66) Ethylbenzene	18.11	91	520830	5.210	ng	99
67) m- & p-Xylenes	18.27	91	793926	10.680	ng	99
68) Bromoform	18.35	173	133160	5.889	ng	100
69) Styrene	18.59	104	339751	5.607	ng	100
70) o-Xylene	18.69	91	407707	5.392	ng	98
71) n-Nonane	18.87	43	187557	5.238	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	209046	5.490	ng	99
74) Cumene	19.20	105	538840	5.326	ng	99
75) alpha-Pinene	19.54	93	272589	5.477	ng	100
76) n-Propylbenzene	19.64	91	638967	5.478	ng	99
77) 3-Ethyltoluene	19.73	105	541294	5.527	ng	100
78) 4-Ethyltoluene	19.77	105	506461	5.445	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	441690	5.364	ng	100
80) alpha-Methylstyrene	19.96	118	254569	5.903	ng	99
81) 2-Ethyltoluene	20.00	105	530149	5.407	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	449532	5.539	ng	100
83) n-Decane	20.26	57	217790	5.532	ng	99
84) Benzyl Chloride	20.31	91	333749	5.965	ng	99
85) 1,3-Dichlorobenzene	20.32	146	295764	5.765	ng	100
86) 1,4-Dichlorobenzene	20.39	146	305211	5.765	ng	100
87) sec-Butylbenzene	20.42	105	604100	5.543	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	567373	5.555	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	443124	5.517	ng	99
90) 1,2-Dichlorobenzene	20.68	146	286998	5.851	ng	99
91) d-Limonene	20.68	68	161943	5.585	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	107573	5.593	ng	98
93) n-Undecane	21.34	57	239287	5.942	ng	98
94) 1,2,4-Trichlorobenzene	22.17	180	242704	6.148	ng	99
95) Naphthalene	22.28	128	702929	5.708	ng	100
96) n-Dodecane	22.24	57	242687	7.164	ng	99
97) Hexachlorobutadiene	22.58	225	157203	5.810	ng	100
98) Cyclohexanone	18.41	55	138065	4.607	ng	99
99) tert-Butylbenzene	20.19	119	444036	5.552	ng	100
100) n-Butylbenzene	20.91	91	489096	5.665	ng	99

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

Data File: I:\MS16\DATA\2019 03\22\03221907.D

Acq On : 22 Mar 2019 4:43

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:07 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	249375	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.43	114	952689	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	423959	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	280099	11.655	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.28%
57) Toluene-d8 (SS2)	15.87	98	900156	11.537	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.32%
73) Bromofluorobenzene (SS3)	19.09	174	404943	12.626	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.04%

Target Compounds

						Qvalue
2) Propene	4.04	42	537315	21.367	ng	100
3) Dichlorodifluoromethan...	4.21	85	1040564	22.114	ng	100
4) Chloromethane	4.52	50	804093	20.693	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	673477	23.033	ng	100
6) Vinyl Chloride	4.96	62	826068	22.375	ng	100
7) 1,3-Butadiene	5.23	54	598049	23.529	ng	100
8) Bromomethane	5.70	94	523583	22.890	ng	100
9) Chloroethane	6.04	64	375992	22.054	ng	100
10) Ethanol	6.44	45	1763643	93.192	ng	100
11) Acetonitrile	6.71	41	896736	21.081	ng	100
12) Acrolein	6.90	56	330582	22.888	ng	100
13) Acetone	7.11	58	1862638	104.686	ng	100
14) Trichlorofluoromethane	7.35	101	933292	23.569	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2478572	41.628	ng	100
16) Acrylonitrile	7.90	53	700468	23.233	ng	100
17) 1,1-Dichloroethene	8.35	96	565911	23.828	ng	100
18) 2-Methyl-2-Propanol (t...	8.51	59	2620310	46.256	ng	100
19) Methylene Chloride	8.58	84	570124	23.323	ng	100
20) 3-Chloro-1-propene (Al...	8.74	41	685719	22.674	ng	100
21) Trichlorotrifluoroethane	8.99	151	584127	23.943	ng	100
22) Carbon Disulfide	8.85	76	2098987	22.539	ng	100
23) trans-1,2-Dichloroethene	9.87	61	757308	23.469	ng	100
24) 1,1-Dichloroethane	10.12	63	900096	22.228	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1582293	23.796	ng	100
26) Vinyl Acetate	10.38	86	649736	128.169	ng	100
27) 2-Butanone (MEK)	10.62	72	371057	21.500	ng	100
28) cis-1,2-Dichloroethene	11.15	61	784660	24.785	ng	100
29) Diisopropyl Ether	11.42	87	472847	23.406	ng	100
30) Ethyl Acetate	11.43	61	428731	47.639	ng	100
31) n-Hexane	11.41	57	864970	23.394	ng	100
32) Chloroform	11.49	83	1028091	25.507	ng	100
34) Tetrahydrofuran (THF)	11.88	72	391886	21.962	ng	100
35) Ethyl tert-Butyl Ether	12.01	87	665459	24.115	ng	100
36) 1,2-Dichloroethane	12.30	62	650699	23.826	ng	100
38) 1,1,1-Trichloroethane	12.57	97	840736	27.041	ng	100
39) Isopropyl Acetate	12.98	61	663342	42.476	ng	# 100
40) 1-Butanol	13.01	56	1038050	50.988	ng	100
41) Benzene	13.04	78	2138337	22.765	ng	100
42) Carbon Tetrachloride	13.20	117	763975	26.948	ng	100
43) Cyclohexane	13.33	84	1632688	48.186	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1505780	25.344	ng	100
45) 1,2-Dichloropropane	13.89	63	526943	24.450	ng	100
46) Bromodichloromethane	14.09	83	747059	26.545	ng	100
47) Trichloroethene	14.13	130	679145	25.730	ng	100
48) 1,4-Dioxane	14.11	88	475482	23.927	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	2085864	23.566	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221907.D

Acq On : 22 Mar 2019 4:43

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:07 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	475247	49.880	ng	100
51) n-Heptane	14.45	71	500083	24.352	ng	100
52) cis-1,3-Dichloropropene	14.99	75	949776	28.499	ng	100
53) 4-Methyl-2-pentanone	15.02	58	485924	22.861	ng	100
54) trans-1,3-Dichloropropene	15.51	75	818470	28.905	ng	100
55) 1,1,2-Trichloroethane	15.69	97	565831	25.673	ng	100
58) Toluene	15.97	91	2222540	22.017	ng	100
59) 2-Hexanone	16.21	43	1076086	21.380	ng	100
60) Dibromochloromethane	16.39	129	737182	26.248	ng	100
61) 1,2-Dibromoethane	16.64	107	680325	24.809	ng	100
62) n-Butyl Acetate	16.83	43	1209728	21.903	ng	100
63) n-Octane	16.95	57	416930	22.156	ng	100
64) Tetrachloroethene	17.11	166	808602	25.609	ng	100
65) Chlorobenzene	17.77	112	1792406	25.546	ng	100
66) Ethylbenzene	18.11	91	2778119	24.449	ng	100
67) m- & p-Xylenes	18.27	91	4326866	51.207	ng	100
68) Bromoform	18.35	173	755028	29.374	ng	100
69) Styrene	18.59	104	1862665	27.042	ng	100
70) o-Xylene	18.69	91	2176650	25.323	ng	100
71) n-Nonane	18.87	43	969175	23.809	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1137943	26.290	ng	100
74) Cumene	19.20	105	2835675	24.658	ng	100
75) alpha-Pinene	19.54	93	1332106	23.545	ng	100
76) n-Propylbenzene	19.64	91	3060439	23.082	ng	100
77) 3-Ethyltoluene	19.73	105	2595454	23.312	ng	100
78) 4-Ethyltoluene	19.77	105	2456507	23.233	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	2128978	22.746	ng	100
80) alpha-Methylstyrene	19.97	118	1236784	25.231	ng	100
81) 2-Ethyltoluene	20.00	105	2526984	22.675	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2115433	22.929	ng	100
83) n-Decane	20.26	57	1014638	22.675	ng	100
84) Benzyl Chloride	20.31	91	1849161	29.072	ng	100
85) 1,3-Dichlorobenzene	20.32	146	1423212	24.403	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1432451	23.803	ng	100
87) sec-Butylbenzene	20.42	105	2857789	23.070	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2646786	22.796	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	2065880	22.627	ng	100
90) 1,2-Dichlorobenzene	20.68	146	1343348	24.092	ng	100
91) d-Limonene	20.68	68	742502	22.527	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	544581	24.907	ng	100
93) n-Undecane	21.34	57	1062491	23.211	ng	100
94) 1,2,4-Trichlorobenzene	22.17	180	1158214	25.812	ng	100
95) Naphthalene	22.28	128	3237950	23.129	ng	100
96) n-Dodecane	22.24	57	966728	25.107	ng	100
97) Hexachlorobutadiene	22.58	225	747356	24.297	ng	100
98) Cyclohexanone	18.41	55	821984	24.129	ng	100
99) tert-Butylbenzene	20.19	119	2103387	23.135	ng	100
100) n-Butylbenzene	20.92	91	2278841	23.221	ng	100

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

Data File: I:\MS16\DATA\2019 03\22\03221907.D

Acq On : 22 Mar 2019 4:43

Operator: LH

Sample : 25ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:07 2019

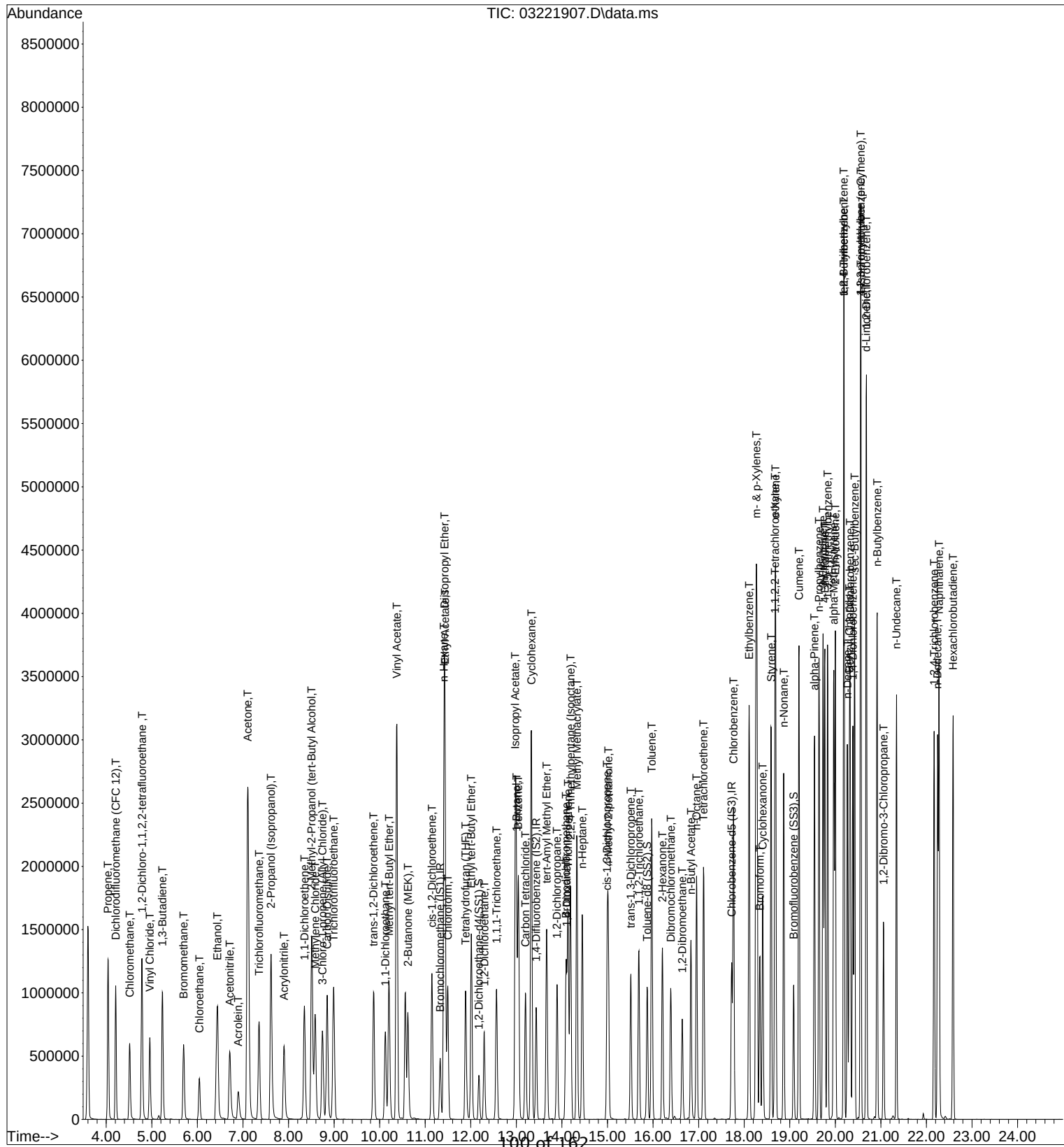
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Data File: I:\MS16\DATA\2019 03\22\03221908.D

Acq On : 22 Mar 2019 5:16

Operator: LH

Sample : 50ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:10 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/22/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	256546	12.500	ng	0.00
37) 1,4-Difluorobenzene (IS2)	13.44	114	960386	12.500	ng	0.00
56) Chlorobenzene-d5 (IS3)	17.72	82	426073	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	281100	11.370	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	90.96%
57) Toluene-d8 (SS2)	15.88	98	912644	11.639	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	93.12%
73) Bromofluorobenzene (SS3)	19.09	174	400668	12.431	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.44%

Target Compounds

						Qvalue
2) Propene	4.04	42	1019583	39.412	ng	99
3) Dichlorodifluoromethan...	4.21	85	1989284	41.095	ng	100
4) Chloromethane	4.52	50	1383251	34.603	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	1143967	38.030	ng	99
6) Vinyl Chloride	4.96	62	1598819	42.096	ng	100
7) 1,3-Butadiene	5.24	54	1145574	43.811	ng	99
8) Bromomethane	5.70	94	1014278	43.104	ng	100
9) Chloroethane	6.05	64	733934	41.845	ng	100
10) Ethanol	6.47	45	3395786	174.419	ng	100
11) Acetonitrile	6.73	41	1791956	40.948	ng	99
12) Acrolein	6.91	56	647131	43.552	ng	100
13) Acetone	7.12	58	3460368	189.047	ng	98
14) Trichlorofluoromethane	7.36	101	1827464	44.861	ng	100
15) 2-Propanol (Isopropanol)	7.64	45	4533723	74.017	ng	99
16) Acrylonitrile	7.91	53	1387230	44.725	ng	100
17) 1,1-Dichloroethene	8.35	96	1222001	50.014	ng	99
18) 2-Methyl-2-Propanol (t...	8.53	59	5374315	92.220	ng	99
19) Methylene Chloride	8.60	84	1220603	48.537	ng	100
20) 3-Chloro-1-propene (Al...	8.75	41	1491196	47.930	ng	99
21) Trichlorotrifluoroethane	8.99	151	1254558	49.986	ng	100
22) Carbon Disulfide	8.85	76	4592305	47.934	ng	100
23) trans-1,2-Dichloroethene	9.87	61	1625852	48.977	ng	100
24) 1,1-Dichloroethane	10.13	63	1932037	46.379	ng	100
25) Methyl tert-Butyl Ether	10.21	73	3352418	49.007	ng	100
26) Vinyl Acetate	10.39	86	1367031	262.126	ng	# 90
27) 2-Butanone (MEK)	10.63	72	809495	45.592	ng	96
28) cis-1,2-Dichloroethene	11.15	61	1555510	47.760	ng	100
29) Diisopropyl Ether	11.42	87	923740	44.447	ng	# 92
30) Ethyl Acetate	11.44	61	802453	86.674	ng	98
31) n-Hexane	11.42	57	1684357	44.281	ng	100
32) Chloroform	11.50	83	1979546	47.739	ng	100
34) Tetrahydrofuran (THF)	11.89	72	724916	39.491	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	1286526	45.318	ng	99
36) 1,2-Dichloroethane	12.30	62	1283828	45.695	ng	100
38) 1,1,1-Trichloroethane	12.57	97	1648159	52.586	ng	100
39) Isopropyl Acetate	12.98	61	1266399	80.441	ng	# 99
40) 1-Butanol	13.02	56	2022551	98.549	ng	99
41) Benzene	13.05	78	4095159	43.248	ng	100
42) Carbon Tetrachloride	13.20	117	1516319	53.057	ng	100
43) Cyclohexane	13.33	84	3124359	91.472	ng	99
44) tert-Amyl Methyl Ether	13.67	73	2989144	49.907	ng	99
45) 1,2-Dichloropropane	13.90	63	1033182	47.555	ng	100
46) Bromodichloromethane	14.09	83	1458565	51.412	ng	100
47) Trichloroethene	14.14	130	1324448	49.776	ng	100
48) 1,4-Dioxane	14.11	88	917953	45.824	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	3895141	44.775	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221908.D

Acq On : 22 Mar 2019 5:16

Operator: LH

Sample : 50ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:10 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	920104	95.796	ng	99
51) n-Heptane	14.45	71	977664	47.227	ng	99
52) cis-1,3-Dichloropropene	15.00	75	1869551	55.648	ng	100
53) 4-Methyl-2-pentanone	15.02	58	940235	43.879	ng	98
54) trans-1,3-Dichloropropene	15.51	75	1633636	57.231	ng	100
55) 1,1,2-Trichloroethane	15.69	97	1113835	50.131	ng	99
58) Toluene	15.98	91	4678852	46.119	ng	100
59) 2-Hexanone	16.21	43	2293946	45.350	ng	98
60) Dibromochloromethane	16.39	129	1609209	57.012	ng	100
61) 1,2-Dibromoethane	16.64	107	1457278	52.877	ng	100
62) n-Butyl Acetate	16.83	43	2621095	47.222	ng	99
63) n-Octane	16.96	57	909534	48.093	ng	100
64) Tetrachloroethene	17.11	166	1609941	50.734	ng	100
65) Chlorobenzene	17.77	112	3465198	49.143	ng	100
66) Ethylbenzene	18.11	91	5352374	46.870	ng	100
67) m- & p-Xylenes	18.27	91	7966754	93.815	ng	99
68) Bromoform	18.35	173	1471946	56.982	ng	100
69) Styrene	18.59	104	3543535	51.190	ng	100
70) o-Xylene	18.69	91	4004996	46.363	ng	99
71) n-Nonane	18.87	43	1815046	44.368	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	2072091	47.633	ng	100
74) Cumene	19.20	105	5415618	46.858	ng	100
75) alpha-Pinene	19.54	93	2846124	50.055	ng	100
76) n-Propylbenzene	19.64	91	6277729	47.113	ng	100
77) 3-Ethyltoluene	19.73	105	5780958	51.667	ng	100
78) 4-Ethyltoluene	19.77	105	4738167	44.590	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	4370341	46.461	ng	100
80) alpha-Methylstyrene	19.97	118	2556193	51.888	ng	100
81) 2-Ethyltoluene	20.00	105	5115381	45.673	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	4282188	46.185	ng	99
83) n-Decane	20.26	57	1998871	44.448	ng	99
84) Benzyl Chloride	20.31	91	3920822	61.337	ng	100
85) 1,3-Dichlorobenzene	20.33	146	2892007	49.342	ng	100
86) 1,4-Dichlorobenzene	20.39	146	2911882	48.146	ng	100
87) sec-Butylbenzene	20.42	105	5671243	45.556	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	5278385	45.235	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	4213018	45.914	ng	99
90) 1,2-Dichlorobenzene	20.68	146	2657403	47.423	ng	100
91) d-Limonene	20.68	68	1444869	43.619	ng	98
92) 1,2-Dibromo-3-Chloropr...	21.06	157	1131092	51.475	ng	99
93) n-Undecane	21.34	57	1940010	42.171	ng	99
94) 1,2,4-Trichlorobenzene	22.17	180	2202451	48.841	ng	100
95) Naphthalene	22.28	128	6112614	43.447	ng	100
96) n-Dodecane	22.24	57	1762610	45.549	ng	99
97) Hexachlorobutadiene	22.59	225	1421289	45.979	ng	100
98) Cyclohexanone	18.41	55	1571195	45.893	ng	99
99) tert-Butylbenzene	20.19	119	4217676	46.160	ng	100
100) n-Butylbenzene	20.92	91	4594325	46.584	ng	99

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

Data File: I:\MS16\DATA\2019 03\22\03221909.D

Acq On : 22 Mar 2019 5:50

Operator: LH

Sample : 100ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:13 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.34	130	249897	12.500	ng	0.02
37) 1,4-Difluorobenzene (IS2)	13.45	114	1032833	12.500	ng	0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	434334	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.19	65	303275	12.593	ng	0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.72%
57) Toluene-d8 (SS2)	15.88	98	927709	11.606	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	92.88%
73) Bromofluorobenzene (SS3)	19.09	174	397796	12.107	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	96.88%

Target Compounds

						Qvalue
2) Propene	4.05	42	2351183	93.302	ng	98
3) Dichlorodifluoromethan...	4.22	85	4122600	87.431	ng	100
4) Chloromethane	4.53	50	2494684	64.066	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.80	135	2324438	79.330	ng	100
6) Vinyl Chloride	4.97	62	2832421	76.560	ng	100
7) 1,3-Butadiene	5.25	54	2078631	81.609	ng	99
8) Bromomethane	5.71	94	2164636	94.438	ng	100
9) Chloroethane	6.05	64	1435287	84.010	ng	100
10) Ethanol	6.52	45	6437959	339.474	ng	100
11) Acetonitrile	6.76	41	3558033	83.469	ng	99
12) Acrolein	6.92	56	1282846	88.633	ng	100
13) Acetone	7.15	58	6305200	353.632	ng	98
14) Trichlorofluoromethane	7.36	101	3601327	90.758	ng	100
15) 2-Propanol (Isopropanol)	7.67	45	6983104	117.038	ng	99
16) Acrylonitrile	7.94	53	2723500	90.142	ng	100
17) 1,1-Dichloroethene	8.36	96	2185731	91.838	ng	100
18) 2-Methyl-2-Propanol (t...	8.56	59	8027308	141.408	ng	99
19) Methylene Chloride	8.60	84	2161304	88.230	ng	99
20) 3-Chloro-1-propene (Al...	8.76	41	2639213	87.087	ng	99
21) Trichlorotrifluoroethane	9.00	151	2243050	91.749	ng	99
22) Carbon Disulfide	8.86	76	7941034	85.093	ng	100
23) trans-1,2-Dichloroethene	9.88	61	3249384	100.489	ng	100
24) 1,1-Dichloroethane	10.14	63	3848969	94.853	ng	100
25) Methyl tert-Butyl Ether	10.21	73	6616633	99.297	ng	100
26) Vinyl Acetate	10.40	86	2506537	493.413	ng	# 74
27) 2-Butanone (MEK)	10.64	72	1567093	90.610	ng	94
28) cis-1,2-Dichloroethene	11.16	61	2876809	90.679	ng	100
29) Diisopropyl Ether	11.43	87	1654230	81.714	ng	# 82
30) Ethyl Acetate	11.45	61	1392036	154.356	ng	95
31) n-Hexane	11.42	57	2983150	80.512	ng	99
32) Chloroform	11.51	83	3771783	93.382	ng	100
34) Tetrahydrofuran (THF)	11.89	72	1537158	85.967	ng	98
35) Ethyl tert-Butyl Ether	12.02	87	2758114	99.741	ng	98
36) 1,2-Dichloroethane	12.31	62	2715227	99.213	ng	100
38) 1,1,1-Trichloroethane	12.57	97	3437881	101.995	ng	100
39) Isopropyl Acetate	12.99	61	2600852	153.617	ng	# 92
40) 1-Butanol	13.03	56	4062560	184.064	ng	97
41) Benzene	13.06	78	8166214	80.193	ng	99
42) Carbon Tetrachloride	13.21	117	3210737	104.464	ng	100
43) Cyclohexane	13.34	84	6156315	167.596	ng	97
44) tert-Amyl Methyl Ether	13.68	73	6034072	93.679	ng	99
45) 1,2-Dichloropropane	13.90	63	1980133	84.748	ng	100
46) Bromodichloromethane	14.09	83	2828034	92.691	ng	100
47) Trichloroethene	14.14	130	2507663	87.633	ng	100
48) 1,4-Dioxane	14.12	88	1723382	79.995	ng	98
49) 2,2,4-Trimethylpentane...	14.19	57	7303027	76.106	ng	99

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Data File: I:\MS16\DATA\2019 03\22\03221909.D

Acq On : 22 Mar 2019 5:50

Operator: LH

Sample : 100ng TO-15 ICAL STD

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 10:55:13 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 10:54:33 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.34	100	1751593	169.573	ng	95
51) n-Heptane	14.46	71	1853878	83.272	ng	99
52) cis-1,3-Dichloropropene	15.00	75	3577864	99.027	ng	100
53) 4-Methyl-2-pentanone	15.03	58	1742937	75.635	ng	96
54) trans-1,3-Dichloropropene	15.52	75	3217418	104.809	ng	100
55) 1,1,2-Trichloroethane	15.69	97	2146280	89.823	ng	100
58) Toluene	15.98	91	8319296	80.443	ng	100
59) 2-Hexanone	16.22	43	3883609	75.316	ng	98
60) Dibromochloromethane	16.39	129	2851654	99.109	ng	99
61) 1,2-Dibromoethane	16.65	107	2599981	92.545	ng	100
62) n-Butyl Acetate	16.84	43	4366904	77.178	ng	99
63) n-Octane	16.96	57	1492650	77.425	ng	98
64) Tetrachloroethene	17.11	166	2795795	86.428	ng	100
65) Chlorobenzene	17.77	112	6598258	91.795	ng	100
66) Ethylbenzene	18.11	91	10038061	86.231	ng	99
67) m- & p-Xylenes	18.28	91	14586675	168.504	ng	99
68) Bromoform	18.35	173	2841207	107.897	ng	99
69) Styrene	18.59	104	6608564	93.651	ng	98
70) o-Xylene	18.70	91	7224973	82.047	ng	98
71) n-Nonane	18.87	43	3046783	73.061	ng	95
72) 1,1,2,2-Tetrachloroethane	18.68	83	3653251	82.384	ng	100
74) Cumene	19.21	105	9771378	82.937	ng	100
75) alpha-Pinene	19.54	93	5085744	87.743	ng	99
76) n-Propylbenzene	19.64	91	11362271	83.649	ng	98
77) 3-Ethyltoluene	19.74	105	9525959	83.518	ng	100
78) 4-Ethyltoluene	19.77	105	8605788	79.448	ng	100
79) 1,3,5-Trimethylbenzene	19.84	105	7346233	76.612	ng	99
80) alpha-Methylstyrene	19.97	118	4236821	84.368	ng	98
81) 2-Ethyltoluene	20.01	105	8497363	74.426	ng	100
82) 1,2,4-Trimethylbenzene	20.20	105	6941775	73.446	ng	98
83) n-Decane	20.27	57	3140313	68.502	ng	97
84) Benzyl Chloride	20.31	91	6592505	101.171	ng	100
85) 1,3-Dichlorobenzene	20.34	146	4755706	79.596	ng	100
86) 1,4-Dichlorobenzene	20.39	146	4884922	79.233	ng	99
87) sec-Butylbenzene	20.42	105	9218530	72.641	ng	99
88) 4-Isopropyltoluene (p-...	20.56	119	8191997	68.869	ng	97
89) 1,2,3-Trimethylbenzene	20.57	105	6642233	71.011	ng	98
90) 1,2-Dichlorobenzene	20.69	146	4314237	75.525	ng	100
91) d-Limonene	20.68	68	2180004	64.559	ng	91
92) 1,2-Dibromo-3-Chloropr...	21.06	157	1931660	86.236	ng	98
93) n-Undecane	21.34	57	3271317	69.757	ng	97
94) 1,2,4-Trichlorobenzene	22.17	180	4161006	90.518	ng	100
95) Naphthalene	22.28	128	11008617	76.758	ng	99
96) n-Dodecane	22.24	57	3107289	78.771	ng	96
97) Hexachlorobutadiene	22.58	225	2839611	90.114	ng	99
98) Cyclohexanone	18.42	55	2927035	83.869	ng	98
99) tert-Butylbenzene	20.19	119	6798556	72.991	ng	100
100) n-Butylbenzene	20.92	91	7455717	74.159	ng	99

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

Data File: I:\MS16\DATA\2019 03\22\03221910.D

Acq On : 22 Mar 2019 6:23

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:11:28 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

LH 3/22/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	235822	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	994078	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	398050	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	288276	12.758	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.08%
57) Toluene-d8 (SS2)	15.87	98	932219	12.802	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.40%
73) Bromofluorobenzene (SS3)	19.09	174	385396	12.513	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.08%

Target Compounds

						Qvalue
2) Propene	4.04	42	491683	23.518	ng	99
3) Dichlorodifluoromethan...	4.21	85	1040110	25.588	ng	100
4) Chloromethane	4.52	50	825535	25.916	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	691159	26.314	ng	100
6) Vinyl Chloride	4.96	62	831258	26.719	ng	100
7) 1,3-Butadiene	5.24	54	563886	26.207	ng	99
8) Bromomethane	5.70	94	581606	28.104	ng	100
9) Chloroethane	6.04	64	412073	28.159	ng	99
10) Ethanol	6.45	45	1920835	140.137	ng	100
11) Acetonitrile	6.71	41	943921	27.312	ng	100
12) Acrolein	6.90	56	350159	30.355	ng	100
13) Acetone	7.11	58	1963890	129.714	ng	99
14) Trichlorofluoromethane	7.36	101	973682	26.953	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2651598	59.107	ng	99
16) Acrylonitrile	7.91	53	739083	31.622	ng	100
17) 1,1-Dichloroethene	8.35	96	597664	27.940	ng	99
18) 2-Methyl-2-Propanol (t...	8.51	59	2814264	60.380	ng	100
19) Methylene Chloride	8.59	84	604624	27.500	ng	100
20) 3-Chloro-1-propene (Al...	8.75	41	751759	29.141	ng	100
21) Trichlorotrifluoroethane	8.99	151	615898	26.781	ng	100
22) Carbon Disulfide	8.85	76	2226060	28.434	ng	100
23) trans-1,2-Dichloroethene	9.87	61	801004	28.189	ng	100
24) 1,1-Dichloroethane	10.12	63	985302	27.125	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1668046	27.965	ng	100
26) Vinyl Acetate	10.38	86	695839	158.174	ng	100
27) 2-Butanone (MEK)	10.62	72	439405	31.509	ng	100
28) cis-1,2-Dichloroethene	11.15	61	759483	26.908	ng	100
29) Diisopropyl Ether	11.42	87	463347	25.693	ng	99
30) Ethyl Acetate	11.44	61	417721	58.955	ng	99
31) n-Hexane	11.41	57	841232	26.151	ng	100
32) Chloroform	11.49	83	992734	27.151	ng	100
34) Tetrahydrofuran (THF)	11.89	72	392137	27.963	ng	100
35) Ethyl tert-Butyl Ether	12.02	87	690595	27.731	ng	100
36) 1,2-Dichloroethane	12.30	62	684531	27.514	ng	100
38) 1,1,1-Trichloroethane	12.57	97	865999	26.940	ng	100
39) Isopropyl Acetate	12.98	61	722429	54.017	ng	# 99
40) 1-Butanol	13.01	56	1211474	62.472	ng	97
41) Benzene	13.04	78	2313382	24.506	ng	100
42) Carbon Tetrachloride	13.20	117	802714	26.836	ng	100
43) Cyclohexane	13.33	84	1731731	51.825	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1679913	28.863	ng	100
45) 1,2-Dichloropropane	13.90	63	645165	31.218	ng	99
46) Bromodichloromethane	14.09	83	888253	31.622	ng	100
47) Trichloroethene	14.13	130	825615	29.763	ng	99
48) 1,4-Dioxane	14.11	88	586597	32.999	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	2531237	29.834	ng	98

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Data File: I:\MS16\DATA\2019 03\22\03221910.D

Acq On : 22 Mar 2019 6:23

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:11:28 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	595446	69.638	ng	100
51) n-Heptane	14.45	71	589617	29.456	ng	100
52) cis-1,3-Dichloropropene	15.00	75	963151	28.927	ng	100
53) 4-Methyl-2-pentanone	15.02	58	537754	30.279	ng	99
54) trans-1,3-Dichloropropene	15.51	75	874200	30.526	ng	100
55) 1,1,2-Trichloroethane	15.69	97	602273	27.039	ng	100
58) Toluene	15.98	91	2376521	27.018	ng	100
59) 2-Hexanone	16.21	43	1188622	31.689	ng	99
60) Dibromochloromethane	16.39	129	773523	29.336	ng	100
61) 1,2-Dibromoethane	16.64	107	725597	29.168	ng	99
62) n-Butyl Acetate	16.83	43	1370114	34.009	ng	100
63) n-Octane	16.95	57	448126	27.580	ng	100
64) Tetrachloroethene	17.11	166	786160	26.206	ng	100
65) Chlorobenzene	17.77	112	1723291	26.527	ng	100
66) Ethylbenzene	18.11	91	2715417	26.305	ng	99
67) m- & p-Xylenes	18.27	91	4078790	53.384	ng	98
68) Bromoform	18.35	173	727369	30.027	ng	100
69) Styrene	18.59	104	1796113	28.702	ng	99
70) o-Xylene	18.69	91	2081278	26.849	ng	98
71) n-Nonane	18.87	43	940078	26.584	ng	100
72) 1,1,2,2-Tetrachloroethane	18.68	83	1050404	27.243	ng	100
74) Cumene	19.20	105	2769478	26.732	ng	100
75) alpha-Pinene	19.54	93	1418766	27.250	ng	99
76) n-Propylbenzene	19.64	91	3266390	28.231	ng	99
77) 3-Ethyltoluene	19.73	105	2659642	26.178	ng	100
78) 4-Ethyltoluene	19.77	105	2718799	28.738	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	2221187	27.100	ng	100
80) alpha-Methylstyrene	19.97	118	1319606	29.607	ng	99
81) 2-Ethyltoluene	20.00	105	2664059	27.638	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2232633	27.282	ng	100
83) n-Decane	20.26	57	1071599	27.225	ng	100
84) Benzyl Chloride	20.31	91	1986492	31.937	ng	100
85) 1,3-Dichlorobenzene	20.32	146	1488529	27.478	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1503302	26.899	ng	100
87) sec-Butylbenzene	20.42	105	3010757	27.576	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2830937	26.991	ng	99
89) 1,2,3-Trimethylbenzene	20.56	105	2262551	27.835	ng	100
90) 1,2-Dichlorobenzene	20.68	146	1404473	27.109	ng	100
91) d-Limonene	20.68	68	808938	27.967	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	583288	31.621	ng	99
93) n-Undecane	21.34	57	1147412	28.134	ng	100
94) 1,2,4-Trichlorobenzene	22.17	180	1262831	29.666	ng	100
95) Naphthalene	22.28	128	3572380	28.836	ng	100
96) n-Dodecane	22.24	57	1168351	30.033	ng	100
97) Hexachlorobutadiene	22.58	225	785181	26.132	ng	100
98) Cyclohexanone	18.41	55	860976	29.843	ng	100
99) tert-Butylbenzene	20.19	119	2225366	26.959	ng	100
100) n-Butylbenzene	20.92	91	2400482	27.582	ng	100

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

Data File: I:\MS16\DATA\2019 03\22\03221910.D

Acq On : 22 Mar 2019 6:23

Operator: LH

Sample : 25ng TO-15 ICV STD

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:11:28 2019

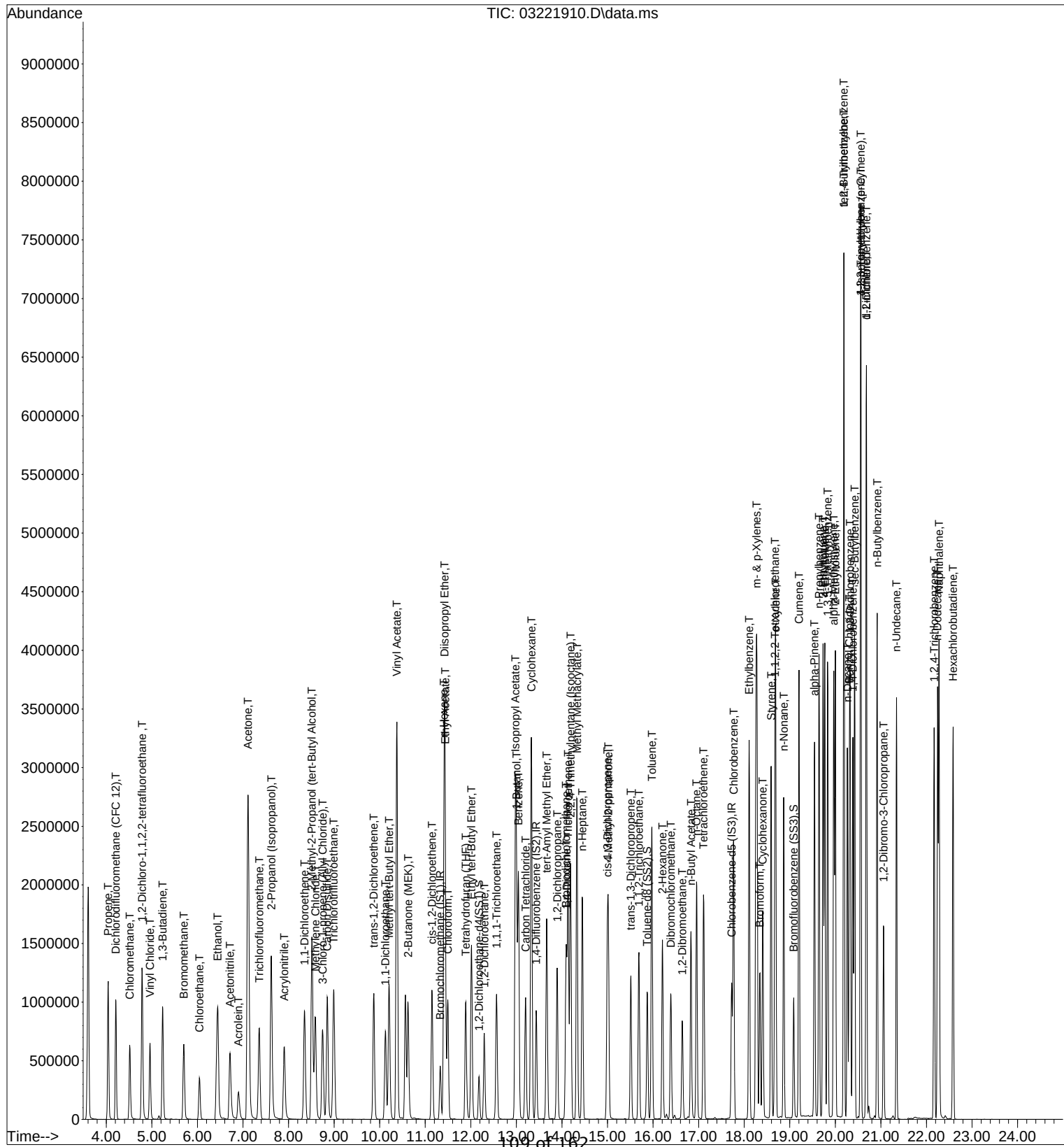
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: 03221910.D

Acq. Method File: TO15.M

Data File Path: I:\MS16\DATA\2019_03\22\

Sample Name: 25ng TO-15 ICV STD

Operator: LH

Misc Info: S31-02111911/S31-03181911 (

Date Acquired: 3/22/19

6:23

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	4.04	23.5	26.43	89	53	112	*	*
3)	Dichlorodifluoromethane (CFC 12)	4.21	25.6	26.30	97	62	103	*	*
4)	Chloromethane	4.52	25.9	26.38	98	51	121	*	*
5)	1,2-Dichloro-1,1,2,2-tetrafluoroethane	4.78	26.3	26.38	100	56	111	*	*
6)	Vinyl Chloride	4.96	26.7	26.73	100	57	117	*	*
7)	1,3-Butadiene	5.24	26.2	26.28	100	53	134	*	*
8)	Bromomethane	5.70	28.1	26.48	106	65	110	*	*
9)	Chloroethane	6.04	28.2	26.75	105	64	111	*	*
10)	Ethanol	6.45	140	128.10	109	57	124	*	*
11)	Acetonitrile	6.71	27.3	25.73	106	57	126	*	*
12)	Acrolein	6.90	30.4	25.63	119	62	121	*	*
13)	Acetone	7.11	130	132.33	98	60	113	*	*
14)	Trichlorofluoromethane	7.36	27.0	26.40	102	63	104	*	*
15)	2-Propanol (Isopropanol)	7.62	59.1	51.60	115	60	124	*	*
16)	Acrylonitrile	7.91	31.6	25.88	122	66	125	*	*
17)	1,1-Dichloroethene	8.35	27.9	27.23	102	68	107	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alcohol)	8.51	60.4	54.25	111	64	114	*	*
19)	Methylene Chloride	8.59	27.5	27.08	102	66	105	*	*
20)	3-Chloro-1-propene (Allyl Chloride)	8.75	29.1	27.00	108	63	127	*	*
21)	Trichlorotrifluoroethane	8.99	26.8	26.95	99	59	109	*	*
22)	Carbon Disulfide	8.85	28.4	27.20	104	67	109	*	*
23)	trans-1,2-Dichloroethene	9.87	28.2	26.73	106	70	115	*	*
24)	1,1-Dichloroethane	10.12	27.1	26.95	101	66	106	*	*
25)	Methyl tert-Butyl Ether	10.21	28.0	26.80	104	67	109	*	*
26)	Vinyl Acetate	10.38	158	133.03	119	68	136	*	*
27)	2-Butanone (MEK)	10.62	31.5	25.95	121	71	116	FAIL	*
28)	cis-1,2-Dichloroethene	11.15	26.9	26.35	102	67	110	*	*
29)	Diisopropyl Ether	11.42	25.7	27.18	95	62	109	*	*
30)	Ethyl Acetate	11.44	59.0	54.45	108	64	127	*	*
31)	n-Hexane	11.41	26.2	26.95	97	60	115	*	*
32)	Chloroform	11.49	27.2	27.08	100	66	105	*	*
34)	Tetrahydrofuran (THF)	11.89	28.0	27.00	104	65	110	*	*
35)	Ethyl tert-Butyl Ether	12.02	27.7	26.80	103	69	109	*	*
36)	1,2-Dichloroethane	12.30	27.5	26.85	102	60	110	*	*
38)	1,1,1-Trichloroethane	12.57	26.9	26.90	100	64	108	*	*
39)	Isopropyl Acetate	12.98	54.0	51.55	105	66	119	*	*
40)	1-Butanol	13.01	62.5	51.58	121	54	143	*	*
41)	Benzene	13.04	24.5	26.38	93	67	106	*	*
42)	Carbon Tetrachloride	13.20	26.8	26.45	101	64	112	*	*
43)	Cyclohexane	13.33	51.8	52.05	100	67	110	*	*
44)	tert-Amyl Methyl Ether	13.67	28.9	27.08	107	68	112	*	*
45)	1,2-Dichloropropane	13.90	31.2	26.98	116	66	112	FAIL	*
46)	Bromodichloromethane	14.09	31.6	26.83	118	67	113	FAIL	*
47)	Trichloroethene	14.13	29.8	26.68	112	66	108	FAIL	*
48)	1,4-Dioxane	14.11	33.0	26.73	123	70	116	FAIL	*
49)	2,2,4-Trimethylpentane (Isooctane)	14.19	29.8	26.65	112	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **03221910.D**

Data File Path: I:\MS16\DATA\2019_03\22\

Operator: **LH**

Date Acquired: **3/22/19**

6:23

TO15.M

Sample Name: **25ng TO-15 ICV STD**

Misc Info: **S31-02111911/S31-03181911 (**

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	14.33	69.6	53.88	129	73	118	FAIL	*
51)	n-Heptane	14.45	29.5	26.90	110	66	110	*	*
52)	cis-1,3-Dichloropropene	15.00	28.9	26.78	108	75	120	*	*
53)	4-Methyl-2-pentanone	15.02	30.3	26.15	116	65	124	*	*
54)	trans-1,3-Dichloropropene	15.51	30.5	26.60	115	77	123	*	*
55)	1,1,2-Trichloroethane	15.69	27.0	26.85	101	68	112	*	*
58)	Toluene	15.98	27.0	26.50	102	62	111	*	*
59)	2-Hexanone	16.21	31.7	26.78	118	59	128	*	*
60)	Dibromochloromethane	16.39	29.3	26.60	110	67	123	*	*
61)	1,2-Dibromoethane	16.64	29.2	27.03	108	66	122	*	*
62)	n-Butyl Acetate	16.83	34.0	27.35	124	64	128	*	*
63)	n-Octane	16.95	27.6	27.13	102	65	114	*	*
64)	Tetrachloroethene	17.11	26.2	26.60	98	55	120	*	*
65)	Chlorobenzene	17.77	26.5	26.83	99	61	114	*	*
66)	Ethylbenzene	18.11	26.3	26.53	99	64	113	*	*
67)	m- & p-Xylenes	18.27	53.4	53.28	100	64	114	*	*
68)	Bromoform	18.35	30.0	26.68	112	65	132	*	*
69)	Styrene	18.59	28.7	26.50	108	67	124	*	*
70)	o-Xylene	18.69	26.8	26.75	100	65	114	*	*
71)	n-Nonane	18.87	26.6	26.83	99	64	117	*	*
72)	1,1,2,2-Tetrachloroethane	18.68	27.2	26.80	101	66	119	*	*
74)	Cumene	19.20	26.7	26.80	100	61	116	*	*
75)	alpha-Pinene	19.54	27.3	26.40	103	65	120	*	*
76)	n-Propylbenzene	19.64	28.2	27.23	104	63	117	*	*
77)	3-Ethyltoluene	19.73	26.2	26.83	98	60	117	*	*
78)	4-Ethyltoluene	19.77	28.7	26.80	107	63	124	*	*
79)	1,3,5-Trimethylbenzene	19.83	27.1	26.73	101	60	117	*	*
80)	alpha-Methylstyrene	19.97	29.6	26.75	111	64	131	*	*
81)	2-Ethyltoluene	20.00	27.6	27.08	102	62	116	*	*
82)	1,2,4-Trimethylbenzene	20.19	27.3	26.90	101	61	122	*	*
83)	n-Decane	20.26	27.2	26.88	101	67	120	*	*
84)	Benzyl Chloride	20.31	31.9	27.08	118	77	142	*	*
85)	1,3-Dichlorobenzene	20.32	27.5	26.98	102	61	125	*	*
86)	1,4-Dichlorobenzene	20.39	26.9	27.00	100	59	123	*	*
87)	sec-Butylbenzene	20.42	27.6	26.55	104	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	20.56	27.0	26.95	100	58	122	*	*
89)	1,2,3-Trimethylbenzene	20.56	27.8	26.95	103	62	124	*	*
90)	1,2-Dichlorobenzene	20.68	27.1	26.95	101	61	126	*	*
91)	d-Limonene	20.68	28.0	26.38	106	66	124	*	*
92)	1,2-Dibromo-3-Chloropropane	21.06	31.6	26.15	121	67	138	*	*
93)	n-Undecane	21.34	28.1	27.03	104	68	127	*	*
94)	1,2,4-Trichlorobenzene	22.17	29.7	26.78	111	62	141	*	*
95)	Naphthalene	22.28	28.8	25.38	113	62	145	*	*
96)	n-Dodecane	22.24	30.0	25.63	117	64	152	*	*
97)	Hexachlorobutadiene	22.58	26.1	26.13	100	49	131	*	*
98)	Cyclohexanone	18.41	29.8	24.45	122	61	127	*	*
99)	tert-Butylbenzene	20.19	27.0	26.88	100	58	122	*	*
100)	n-Butylbenzene	20.92	27.6	27.00	102	64	121	*	*

Bold = 75 Compound List

Data File: I:\MS16\DATA\2019 03\22\03221912.D

Acq On : 22 Mar 2019 7:29

Operator: LH

Sample : CCV R16032219 25ng

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:14:43 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 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)
1 IR	Bromochloromethane (IS1)	1.000	1.000	0.0	104	-0.02
2 T	Propene	1.108	0.998	9.9	99	0.00
3 T	Dichlorodifluoromethane (CF	2.155	2.062	4.3	107	0.00
4 T	Chloromethane	1.688	1.565	7.3	102	-0.01
5 T	1,2-Dichloro-1,1,2,2-tetra	1.392	1.273	8.5	101	-0.01
6 T	Vinyl Chloride	1.649	1.439	12.7	95	-0.01
7 T	1,3-Butadiene	1.141	1.125	1.4	102	-0.01
8 T	Bromomethane	1.097	1.088	0.8	109	-0.01
9 T	Chloroethane	0.776	0.831	-7.1	117	-0.01
10 T	Ethanol	0.727	0.776	-6.7	117	-0.08
11 T	Acetonitrile	1.832	1.842	-0.5	110	-0.04
12 T	Acrolein	0.611	0.724	-18.5	117	-0.02
13 T	Acetone	0.803	0.774	3.6	116	-0.04
14 T	Trichlorofluoromethane	1.915	1.870	2.3	110	-0.01
15 T	2-Propanol (Isopropanol)	2.378	2.659	-11.8	115	-0.05
16 T	Acrylonitrile	1.239	1.438	-16.1	110	-0.03
17 T	1,1-Dichloroethene	1.134	1.174	-3.5	115	-0.01
18 T	2-Methyl-2-Propanol (tert-B	2.471	2.739	-10.8	116	-0.04
19 T	Methylene Chloride	1.165	1.191	-2.2	116	-0.02
20 T	3-Chloro-1-propene (Allyl C	1.367	1.413	-3.4	114	-0.02
21 T	Trichlorotrifluoroethane	1.219	1.150	5.7	109	0.00
22 T	Carbon Disulfide	4.150	4.183	-0.8	111	-0.01
23 T	trans-1,2-Dichloroethene	1.506	1.537	-2.1	112	-0.01
24 T	1,1-Dichloroethane	1.925	1.852	3.8	110	-0.02
25 T	Methyl tert-Butyl Ether	3.162	3.087	2.4	110	0.00
26 T	Vinyl Acetate	0.233	0.267	-14.6	112	-0.03
27 T	2-Butanone (MEK)	0.739	0.786	-6.4	113	-0.02
28 T	cis-1,2-Dichloroethene	1.496	1.468	1.9	102	-0.01
29 T	Diisopropyl Ether	0.956	0.865	9.5	102	-0.01
30 T	Ethyl Acetate	0.376	0.385	-2.4	101	-0.02
31 T	n-Hexane	1.705	1.576	7.6	102	0.00
32 T	Chloroform	1.938	1.853	4.4	101	-0.02
33 S	1,2-Dichloroethane-d4 (SS1)	1.198	1.195	0.3	110	-0.01
34 T	Tetrahydrofuran (THF)	0.743	0.765	-3.0	108	0.00
35 T	Ethyl tert-Butyl Ether	1.320	1.361	-3.1	112	0.00
36 T	1,2-Dichloroethane	1.319	1.320	-0.1	111	-0.01
37 IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	105	-0.01
38 T	1,1,1-Trichloroethane	0.404	0.410	-1.5	106	0.00
39 T	Isopropyl Acetate	0.168	0.170	-1.2	106	-0.01
40 T	1-Butanol	0.244	0.267	-9.4	107	-0.03
41 T	Benzene	1.187	1.091	8.1	106	-0.01
42 T	Carbon Tetrachloride	0.376	0.381	-1.3	104	0.00
43 T	Cyclohexane	0.420	0.412	1.9	106	0.00
44 T	tert-Amyl Methyl Ether	0.732	0.741	-1.2	106	-0.01
45 T	1,2-Dichloropropane	0.260	0.257	1.2	105	0.00
46 T	Bromodichloromethane	0.353	0.365	-3.4	105	0.00
47 T	Trichloroethene	0.349	0.334	4.3	105	-0.01
48 T	1,4-Dioxane	0.224	0.235	-4.9	105	-0.01
49 T	2,2,4-Trimethylpentane (Iso	1.067	1.030	3.5	105	0.00
50 T	Methyl Methacrylate	0.108	0.119	-10.2	107	-0.02
51 T	n-Heptane	0.252	0.243	3.6	105	-0.01
52 T	cis-1,3-Dichloropropene	0.419	0.445	-6.2	105	0.00
53 T	4-Methyl-2-pentanone	0.223	0.240	-7.6	105	-0.01
54 T	trans-1,3-Dichloropropene	0.360	0.406	-12.8	105	0.00

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Data File: I:\MS16\DATA\2019 03\22\03221912.D

Acq On : 22 Mar 2019 7:29

Operator: LH

Sample : CCV R16032219 25ng

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:14:43 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 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)
55 T	1,1,2-Trichloroethane	0.280	0.276	1.4	106	0.00
56 IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	104	0.00
57 S	Toluene-d8 (SS2)	2.287	2.221	2.9	109	0.00
58 T	Toluene	2.762	2.688	2.7	112	0.00
59 T	2-Hexanone	1.178	1.303	-10.6	115	-0.01
60 T	Dibromochloromethane	0.828	0.885	-6.9	114	0.00
61 T	1,2-Dibromoethane	0.781	0.841	-7.7	117	0.00
62 T	n-Butyl Acetate	1.265	1.509	-19.3	119	-0.01
63 T	n-Octane	0.510	0.513	-0.6	117	0.00
64 T	Tetrachloroethene	0.942	0.909	3.5	105	0.00
65 T	Chlorobenzene	2.040	1.999	2.0	105	0.00
66 T	Ethylbenzene	3.242	3.245	-0.1	106	0.00
67 T	m- & p-Xylenes	2.399	2.357	1.8	102	0.00
68 T	Bromoform	0.761	0.850	-11.7	105	0.00
69 T	Styrene	1.965	2.090	-6.4	105	0.00
70 T	o-Xylene	2.434	2.385	2.0	103	0.00
71 T	n-Nonane	1.111	1.083	2.5	105	0.00
72 T	1,1,2,2-Tetrachloroethane	1.211	1.234	-1.9	102	0.00
73 S	Bromofluorobenzene (SS3)	0.967	0.964	0.3	105	0.00
74 T	Cumene	3.253	3.237	0.5	106	0.00
75 T	alpha-Pinene	1.635	1.685	-3.1	115	0.00
76 T	n-Propylbenzene	3.633	3.713	-2.2	115	0.00
77 T	3-Ethyltoluene	3.191	3.204	-0.4	116	0.00
78 T	4-Ethyltoluene	2.971	2.992	-0.7	114	0.00
79 T	1,3,5-Trimethylbenzene	2.574	2.582	-0.3	113	0.00
80 T	alpha-Methylstyrene	1.400	1.522	-8.7	115	0.00
81 T	2-Ethyltoluene	3.027	3.064	-1.2	115	0.00
82 T	1,2,4-Trimethylbenzene	2.570	2.565	0.2	114	-0.01
83 T	n-Decane	1.236	1.204	2.6	112	0.00
84 T	Benzyl Chloride	1.953	2.335	-19.6	117	0.00
85 T	1,3-Dichlorobenzene	1.701	1.697	0.2	113	0.00
86 T	1,4-Dichlorobenzene	1.755	1.672	4.7	111	0.00
87 T	sec-Butylbenzene	3.429	3.528	-2.9	116	0.00
88 T	4-Isopropyltoluene (p-Cymen	3.294	3.256	1.2	113	0.00
89 T	1,2,3-Trimethylbenzene	2.553	2.539	0.5	113	-0.01
90 T	1,2-Dichlorobenzene	1.627	1.593	2.1	114	0.00
91 T	d-Limonene	0.908	0.975	-7.4	117	0.00
92 T	1,2-Dibromo-3-Chloropropane	0.579	0.664	-14.7	112	0.00
93 T	n-Undecane	1.281	1.299	-1.4	114	0.00
94 T	1,2,4-Trichlorobenzene	1.337	1.360	-1.7	110	0.00
95 T	Naphthalene	3.890	3.995	-2.7	111	0.00
96 T	n-Dodecane	1.222	1.189	2.7	112	0.00
97 T	Hexachlorobutadiene	0.944	0.908	3.8	113	0.00
98 T	Cyclohexanone	0.906	1.010	-11.5	106	-0.01
99 T	tert-Butylbenzene	2.592	2.544	1.9	114	0.00
100 T	n-Butylbenzene	2.733	2.751	-0.7	113	0.00

(#)= Out of Range

SPCC's out = 0 CCC's out = 0

Data File: I:\MS16\DATA\2019 03\22\03221912.D

Acq On : 22 Mar 2019 7:29

Operator: LH

Sample : CCV R16032219 25ng

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:14:43 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	259023	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	1004413	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	440532	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	309462	12.468	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.76%
57) Toluene-d8 (SS2)	15.87	98	978291	12.139	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	97.12%
73) Bromofluorobenzene (SS3)	19.09	174	424543	12.455	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	99.60%

Target Compounds

						Qvalue
2) Propene	4.04	42	532901	23.206	ng	99
3) Dichlorodifluoromethan...	4.21	85	1116537	25.008	ng	100
4) Chloromethane	4.52	50	817099	23.354	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	677984	23.501	ng	100
6) Vinyl Chloride	4.96	62	783592	22.931	ng	100
7) 1,3-Butadiene	5.24	54	611540	25.876	ng	100
8) Bromomethane	5.70	94	568622	25.016	ng	100
9) Chloroethane	6.04	64	439835	27.364	ng	100
10) Ethanol	6.44	45	2067545	137.330	ng	100
11) Acetonitrile	6.71	41	985935	25.973	ng	99
12) Acrolein	6.90	56	385546	30.429	ng	99
13) Acetone	7.11	58	2152542	129.439	ng	95
14) Trichlorofluoromethane	7.35	101	1026792	25.877	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2841984	57.677	ng	99
16) Acrylonitrile	7.90	53	770247	30.004	ng	100
17) 1,1-Dichloroethene	8.35	96	652917	27.790	ng	98
18) 2-Methyl-2-Propanol (t...	8.51	59	3042114	59.422	ng	99
19) Methylene Chloride	8.58	84	660105	27.334	ng	99
20) 3-Chloro-1-propene (Al...	8.74	41	780967	27.562	ng	99
21) Trichlorotrifluoroethane	8.99	151	634435	25.116	ng	100
22) Carbon Disulfide	8.85	76	2329237	27.087	ng	100
23) trans-1,2-Dichloroethene	9.87	61	845791	27.099	ng	100
24) 1,1-Dichloroethane	10.12	63	988016	24.764	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1741522	26.582	ng	100
26) Vinyl Acetate	10.38	86	726033	150.255	ng	98
27) 2-Butanone (MEK)	10.62	72	418081	27.295	ng	99
28) cis-1,2-Dichloroethene	11.15	61	801625	25.857	ng	99
29) Diisopropyl Ether	11.42	87	484339	24.452	ng	98
30) Ethyl Acetate	11.44	61	432459	55.568	ng	99
31) n-Hexane	11.41	57	883207	24.997	ng	100
32) Chloroform	11.49	83	1033606	25.737	ng	100
34) Tetrahydrofuran (THF)	11.89	72	423274	27.480	ng	99
35) Ethyl tert-Butyl Ether	12.02	87	747298	27.320	ng	100
36) 1,2-Dichloroethane	12.30	62	725268	26.540	ng	100
38) 1,1,1-Trichloroethane	12.57	97	891107	27.435	ng	100
39) Isopropyl Acetate	12.98	61	703921	52.092	ng	# 98
40) 1-Butanol	13.01	56	1108444	56.571	ng	98
41) Benzene	13.04	78	2264206	23.738	ng	100
42) Carbon Tetrachloride	13.20	117	792414	26.219	ng	100
43) Cyclohexane	13.33	84	1725267	51.100	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1599412	27.197	ng	100
45) 1,2-Dichloropropane	13.90	63	553569	26.510	ng	100
46) Bromodichloromethane	14.09	83	783353	27.600	ng	100
47) Trichloroethene	14.13	130	712801	25.432	ng	100
48) 1,4-Dioxane	14.11	88	501372	27.914	ng	100
49) 2,2,4-Trimethylpentane...	14.19	57	2195268	25.608	ng	99

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Data File: I:\MS16\DATA\2019 03\22\03221912.D

Acq On : 22 Mar 2019 7:29

Operator: LH

Sample : CCV R16032219 25ng

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:14:43 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	508359	58.841	ng	98
51) n-Heptane	14.45	71	526238	26.019	ng	100
52) cis-1,3-Dichloropropene	15.00	75	1001454	29.768	ng	100
53) 4-Methyl-2-pentanone	15.02	58	510439	28.445	ng	99
54) trans-1,3-Dichloropropene	15.51	75	859742	29.712	ng	100
55) 1,1,2-Trichloroethane	15.69	97	597532	26.550	ng	100
58) Toluene	15.97	91	2491622	25.595	ng	100
59) 2-Hexanone	16.21	43	1233039	29.704	ng	99
60) Dibromochloromethane	16.39	129	838173	28.723	ng	100
61) 1,2-Dibromoethane	16.64	107	797216	28.956	ng	100
62) n-Butyl Acetate	16.83	43	1442887	32.361	ng	100
63) n-Octane	16.95	57	486168	27.036	ng	100
64) Tetrachloroethene	17.11	166	847216	25.518	ng	100
65) Chlorobenzene	17.76	112	1877372	26.112	ng	100
66) Ethylbenzene	18.11	91	2953081	25.849	ng	99
67) m- & p-Xylenes	18.27	91	4408101	52.130	ng	98
68) Bromoform	18.35	173	796051	29.694	ng	100
69) Styrene	18.59	104	1951985	28.185	ng	100
70) o-Xylene	18.69	91	2231323	26.009	ng	99
71) n-Nonane	18.87	43	1022241	26.120	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	1156828	27.110	ng	100
74) Cumene	19.20	105	3014980	26.296	ng	100
75) alpha-Pinene	19.54	93	1536546	26.666	ng	100
76) n-Propylbenzene	19.64	91	3520185	27.490	ng	99
77) 3-Ethyltoluene	19.73	105	2998001	26.662	ng	100
78) 4-Ethyltoluene	19.77	105	2797371	26.717	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	2404267	26.504	ng	100
80) alpha-Methylstyrene	19.97	118	1418692	28.761	ng	100
81) 2-Ethyltoluene	20.00	105	2894044	27.128	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2413587	26.649	ng	100
83) n-Decane	20.26	57	1141440	26.203	ng	100
84) Benzyl Chloride	20.31	91	2162268	31.411	ng	100
85) 1,3-Dichlorobenzene	20.33	146	1614454	26.929	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1592245	25.743	ng	100
87) sec-Butylbenzene	20.42	105	3303898	27.343	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2989073	25.750	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	2331113	25.913	ng	99
90) 1,2-Dichlorobenzene	20.68	146	1528430	26.656	ng	100
91) d-Limonene	20.68	68	867681	27.105	ng	99
92) 1,2-Dibromo-3-Chloropr...	21.06	157	609172	29.839	ng	99
93) n-Undecane	21.34	57	1209775	26.802	ng	100
94) 1,2,4-Trichlorobenzene	22.17	180	1275267	27.069	ng	100
95) Naphthalene	22.28	128	3607400	26.310	ng	100
96) n-Dodecane	22.24	57	1079854	25.081	ng	100
97) Hexachlorobutadiene	22.58	225	842480	25.335	ng	100
98) Cyclohexanone	18.41	55	874200	27.379	ng	99
99) tert-Butylbenzene	20.19	119	2391195	26.174	ng	100
100) n-Butylbenzene	20.91	91	2579117	26.776	ng	100

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

Data File: I:\MS16\DATA\2019 03\22\03221912.D

Acq On : 22 Mar 2019 7:29

Operator: LH

Sample : CCV R16032219 25ng

Misc : S31-02111911/S31-03181909 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:14:43 2019

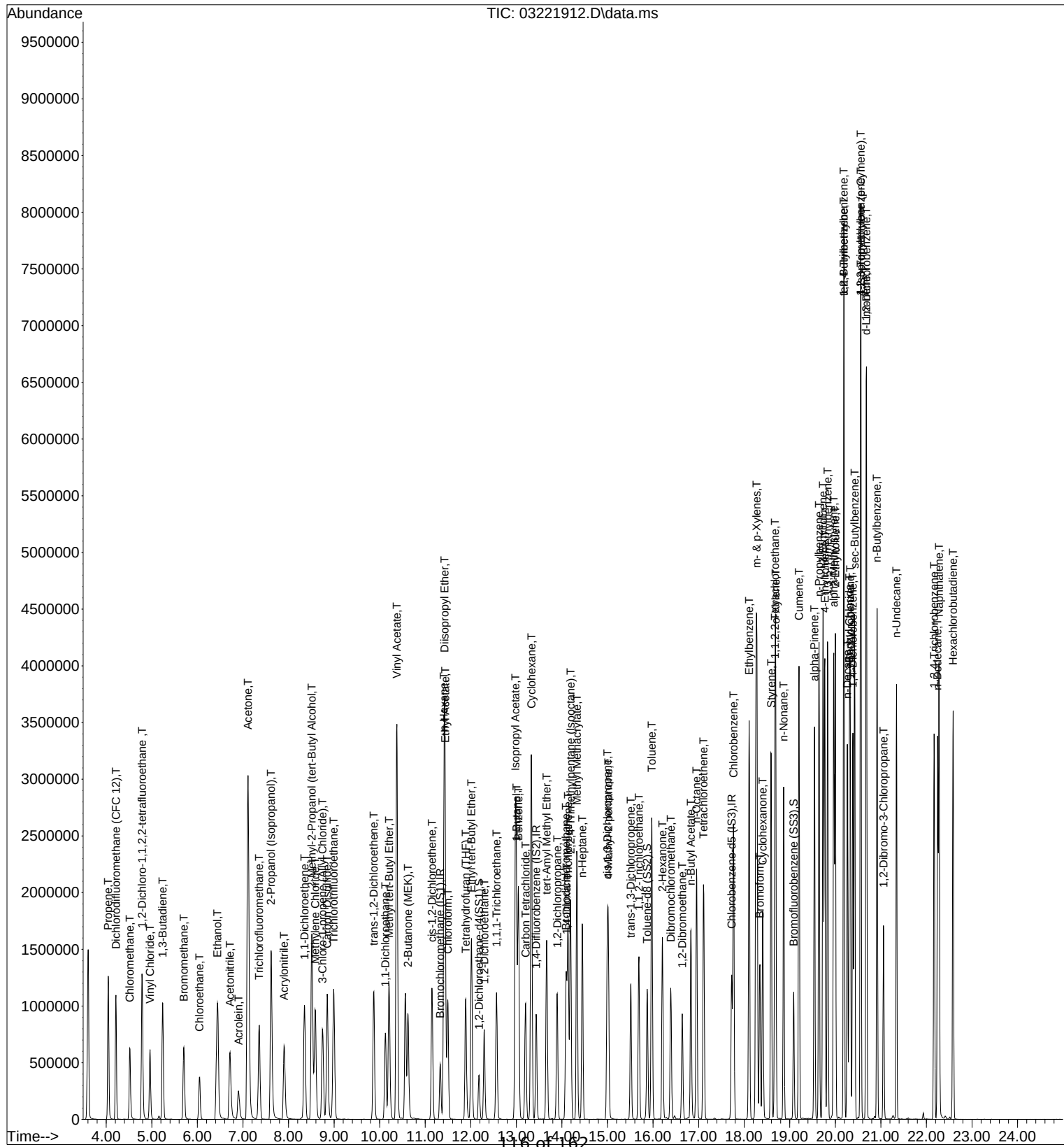
Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:T015.M



ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

ALS Project ID: P1901513

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Internal Standard Area and RT Summary

Test Code: EPA TO-15

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

Lab File ID: 03221912.D

Analyst: Lusine Hakobyan

Date Analyzed: 3/22/19

Sample Type: 6.0 L Silonite Canister(s)

Time Analyzed: 07:29

Test Notes:

	IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
	AREA	# RT	AREA	# RT	AREA	# RT
24 Hour Standard	259023	11.33	1004413	13.43	440532	17.72
Upper Limit	362632	11.66	1406178	13.76	616745	18.05
Lower Limit	155414	11.00	602648	13.10	264319	17.39

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	# RT	AREA	# RT	AREA	# RT
01	Method Blank	233299	11.32	1000150	13.43	400972	17.72
02	Lab Control Sample	228877	11.33	956011	13.43	382332	17.72
03	HUCKIAF031919-1	200475	11.32	852644	13.43	340281	17.72
04	HUCKIAF031919-2	197323	11.32	837000	13.43	342429	17.72
05	HUCKIAFR031919-2	201571	11.32	849085	13.43	347581	17.72
06	HUCKIAF031919-3	198694	11.32	838679	13.43	336793	17.72
07	HUCKIAF031919-4	265738	11.33	847418	13.43	349406	17.72
08	HUCKIAF031919-5	213064	11.32	896281	13.43	351367	17.72
09	HUCKIAF031919-6	201297	11.31	883584	13.43	359728	17.72
10	HUCKAA031919-1	209919	11.31	865483	13.43	353381	17.72
11	HUCKAA031919-2	195765	11.32	832341	13.43	340230	17.72
12	TripBlank031919	203043	11.32	856118	13.43	338244	17.72
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

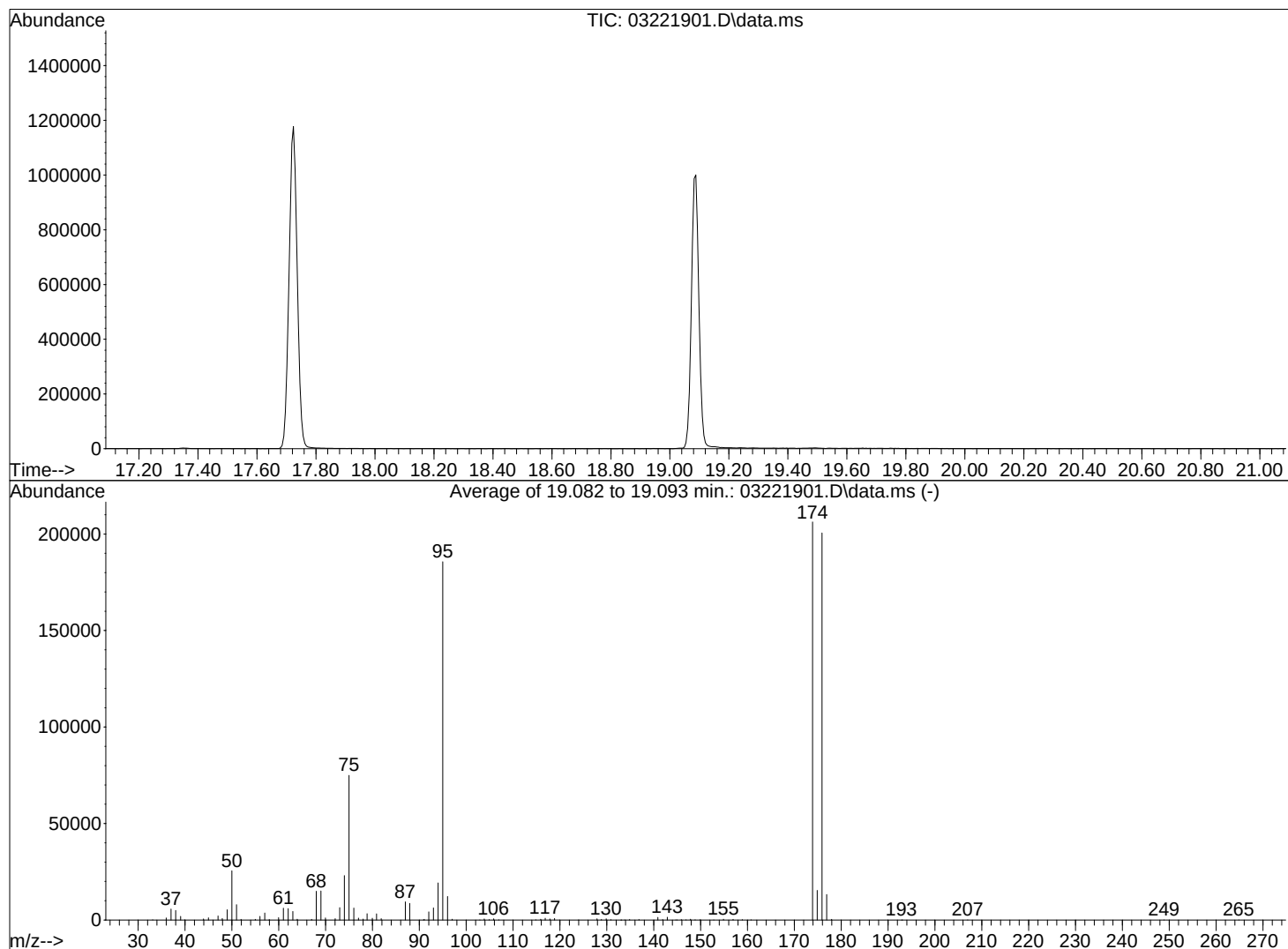
Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits.

Data Path : I:\MS16\DATA\2019 03\22\
 Data File : 03221901.D
 Acq On : 22 Mar 2019 1:24
 Operator : LH
 Sample : 12.5ng TO-15 BFB
 Misc : S31-02111911
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16032219.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Mar 19 18:21:59 2019



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2828

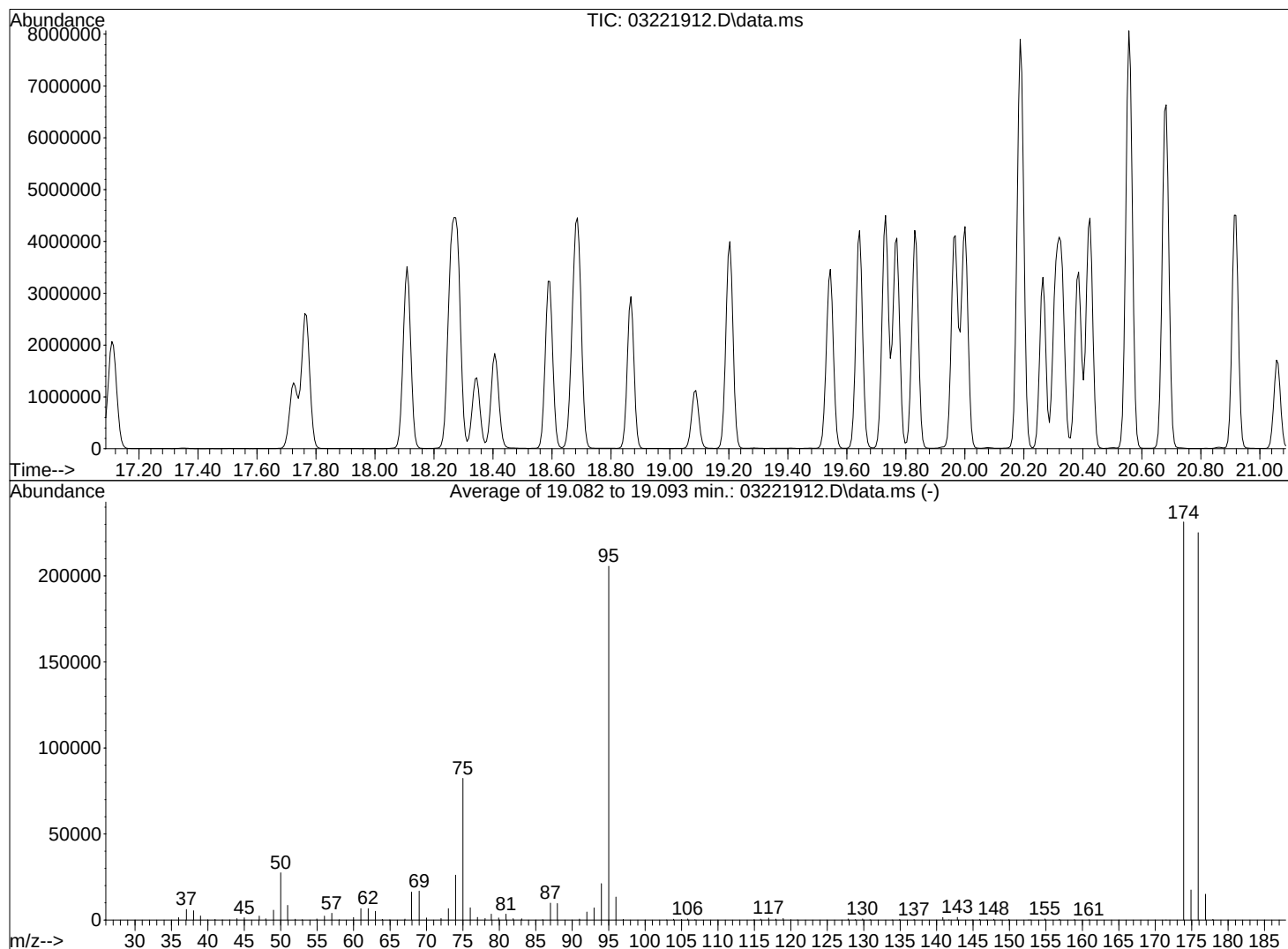
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.7	25496	PASS
75	95	30	66	40.4	74920	PASS
95	95	100	100	100.0	185600	PASS
96	95	5	9	6.6	12253	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	111.1	206251	PASS
175	174	4	9	7.5	15397	PASS
176	174	93	101	97.2	200533	PASS
177	176	5	9	6.6	13264	PASS

LH 3/22/19

Data Path : I:\MS16\DATA\2019 03\22\
 Data File : 03221912.D
 Acq On : 22 Mar 2019 7:29
 Operator : LH
 Sample : CCV R16032219 25ng
 Misc : S31-02111911/S31-03181909 (4/16)
 ALS Vial : 2 Sample Multiplier: 1

Integration File: LSCINT.P

Method : I:\MS16\METHODS\R16032219.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Fri Mar 22 11:09:04 2019



AutoFind: Scans 2836, 2837, 2838; Background Corrected with Scan 2828

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	13.4	27515	PASS
75	95	30	66	40.0	82331	PASS
95	95	100	100	100.0	205611	PASS
96	95	5	9	6.5	13374	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	112.5	231360	PASS
175	174	4	9	7.5	17443	PASS
176	174	93	101	97.3	225152	PASS
177	176	5	9	6.7	14977	PASS

LH 3/25/19

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: Method Blank

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901513

ALS Sample ID: P190322-MB

Test Code: EPA TO-15

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

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/22/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	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	
79-01-6	Trichloroethene	ND	0.11	0.072	ND	0.020	0.013	
127-18-4	Tetrachloroethene	ND	0.11	0.069	ND	0.016	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.

Data File: I:\MS16\DATA\2019 03\22\03221914.D

Acq On : 22 Mar 2019 8:36

Operator: LH

Sample : MB R16032219 1000mL

Misc : S31-02111911/AS01319

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 25 11:05:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/25/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.32	130	233299	12.500	ng	-0.03
37) 1,4-Difluorobenzene (IS2)	13.43	114	1000150	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	17.72	82	400972	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.17	65	282982	12.659	ng	-0.02
Spiked Amount	12.500	Range	70 - 130	Recovery	=	101.28%
57) Toluene-d8 (SS2)	15.87	98	945514	12.890	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	103.12%
73) Bromofluorobenzene (SS3)	19.09	174	390951	12.601	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.80%

Target Compounds

					Qvalue	
2) Propene	4.10	42	354	0.017	ng	# 32
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	6.48	45	8284	0.611	ng	85
11) Acetonitrile	6.81	41	3487	0.102	ng	# 13
12) Acrolein	0.00	56	0	N.D.		
13) Acetone	7.20	58	2564	0.171	ng	# 84
14) Trichlorofluoromethane	0.00	101	0	N.D.		
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D.	d	
16) Acrylonitrile	8.02	53	455	0.020	ng	# 61
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	0.00	76	0	N.D.	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	13.08	56	2730	0.140	ng	# 41
41) Benzene	13.04	78	2068	0.022	ng	78
42) Carbon Tetrachloride	0.00	117	0	N.D.		
43) Cyclohexane	0.00	84	0	N.D.	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.		

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Data File: I:\MS16\DATA\2019 03\22\03221914.D

Acq On : 22 Mar 2019 8:36

Operator: LH

Sample : MB R16032219 1000mL

Misc : S31-02111911/AS01319

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 25 11:05:38 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

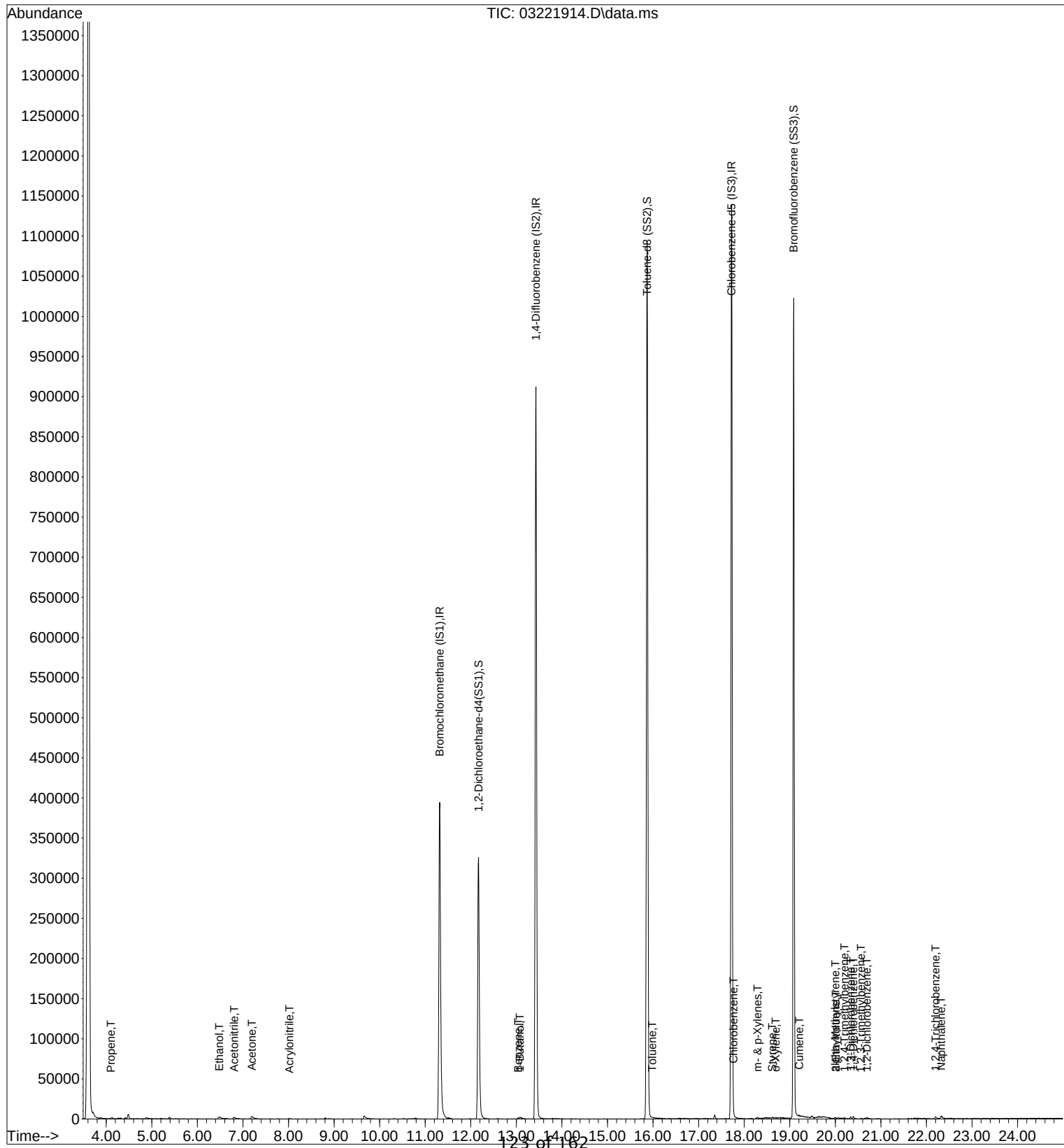
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	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	15.98	91	1610	0.018 ng	#	58
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	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	17.77	112	600	0.009 ng	#	43
66) Ethylbenzene	0.00	91	0	N.D. d		
67) m- & p-Xylenes	18.29	91	5409	0.070 ng	#	39
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	18.61	104	661	0.010 ng		83
70) o-Xylene	18.69	91	671	0.009 ng	#	68
71) n-Nonane	0.00	43	0	N.D.		
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	19.21	105	454	0.004 ng	#	1
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D. d		
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	0.00	105	0	N.D. d		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D. d		
80) alpha-Methylstyrene	20.00	118	111	0.002 ng	#	46
81) 2-Ethyltoluene	20.01	105	550	0.006 ng	#	59
82) 1,2,4-Trimethylbenzene	20.20	105	1782	0.022 ng	#	37
83) n-Decane	0.00	57	0	N.D.		
84) Benzyl Chloride	0.00	91	0	N.D. d		
85) 1,3-Dichlorobenzene	20.34	146	1631	0.030 ng		96
86) 1,4-Dichlorobenzene	20.40	146	2549	0.045 ng		98
87) sec-Butylbenzene	0.00	105	0	N.D. d		
88) 4-Isopropyltoluene (p-...	0.00	119	0	N.D. d		
89) 1,2,3-Trimethylbenzene	20.56	105	445	0.005 ng	#	23
90) 1,2-Dichlorobenzene	20.69	146	1243	0.024 ng		95
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. d		
94) 1,2,4-Trichlorobenzene	22.20	180	2471	0.058 ng	#	93
95) Naphthalene	22.32	128	10358	0.083 ng		87
96) n-Dodecane	0.00	57	0	N.D.		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D.		
99) tert-Butylbenzene	0.00	119	0	N.D. d		
100) n-Butylbenzene	0.00	91	0	N.D. d		

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

Operator: LH

DataAcq Meth:T015.M



ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: WSP Group

Client Sample ID: Lab Control Sample

Client Project ID: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901513

ALS Sample ID: P190322-LCS

Test Code: EPA TO-15

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

Analyst: Lusine Hakobyan

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 3/22/19

Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	211	212	100	67-110	
79-01-6	Trichloroethene	213	209	98	66-108	
127-18-4	Tetrachloroethene	213	212	100	55-120	

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.

Data File: I:\MS16\DATA\2019 03\22\03221915.D

Acq On : 22 Mar 2019 9:09

Operator: LH

Sample : LCS R16032219 25ng

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:15:29 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

LH 3/22/19

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	11.33	130	228877	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	13.43	114	956011	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	17.72	82	382332	12.500	ng	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4(...	12.18	65	275888	12.580	ng	-0.01
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.64%
57) Toluene-d8 (SS2)	15.87	98	898081	12.840	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	102.72%
73) Bromofluorobenzene (SS3)	19.09	174	371129	12.545	ng	0.00
Spiked Amount	12.500	Range	70 - 130	Recovery	=	100.32%

Target Compounds

						Qvalue
2) Propene	4.04	42	490811	24.188	ng	99
3) Dichlorodifluoromethan...	4.20	85	1049076	26.592	ng	100
4) Chloromethane	4.51	50	765271	24.753	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.78	135	638149	25.033	ng	100
6) Vinyl Chloride	4.95	62	740522	24.525	ng	100
7) 1,3-Butadiene	5.24	54	527507	25.260	ng	99
8) Bromomethane	5.70	94	567731	28.266	ng	100
9) Chloroethane	6.04	64	398923	28.087	ng	99
10) Ethanol	6.44	45	1837324	138.112	ng	100
11) Acetonitrile	6.71	41	898855	26.798	ng	100
12) Acrolein	6.90	56	338217	30.209	ng	100
13) Acetone	7.11	58	1901501	129.404	ng	98
14) Trichlorofluoromethane	7.35	101	958052	27.325	ng	100
15) 2-Propanol (Isopropanol)	7.62	45	2549180	58.548	ng	99
16) Acrylonitrile	7.90	53	703834	31.028	ng	100
17) 1,1-Dichloroethene	8.35	96	585423	28.199	ng	99
18) 2-Methyl-2-Propanol (t...	8.51	59	2715746	60.034	ng	100
19) Methylene Chloride	8.58	84	585330	27.430	ng	99
20) 3-Chloro-1-propene (Al...	8.74	41	724453	28.935	ng	99
21) Trichlorotrifluoroethane	8.99	151	603634	27.044	ng	99
22) Carbon Disulfide	8.85	76	2150651	28.304	ng	100
23) trans-1,2-Dichloroethene	9.87	61	772760	28.020	ng	100
24) 1,1-Dichloroethane	10.12	63	948757	26.912	ng	100
25) Methyl tert-Butyl Ether	10.21	73	1619740	27.979	ng	100
26) Vinyl Acetate	10.38	86	667611	156.363	ng	95
27) 2-Butanone (MEK)	10.62	72	383858	28.361	ng	97
28) cis-1,2-Dichloroethene	11.15	61	724904	26.462	ng	100
29) Diisopropyl Ether	11.42	87	445707	25.465	ng	# 95
30) Ethyl Acetate	11.44	61	395283	57.481	ng	98
31) n-Hexane	11.41	57	803302	25.730	ng	100
32) Chloroform	11.49	83	953977	26.883	ng	100
34) Tetrahydrofuran (THF)	11.88	72	374569	27.521	ng	98
35) Ethyl tert-Butyl Ether	12.02	87	671759	27.793	ng	98
36) 1,2-Dichloroethane	12.30	62	662628	27.442	ng	100
38) 1,1,1-Trichloroethane	12.57	97	836151	27.047	ng	100
39) Isopropyl Acetate	12.98	61	678079	52.720	ng	# 98
40) 1-Butanol	13.01	56	1138886	61.068	ng	97
41) Benzene	13.04	78	2214908	24.397	ng	100
42) Carbon Tetrachloride	13.20	117	780939	27.147	ng	100
43) Cyclohexane	13.33	84	1660453	51.670	ng	100
44) tert-Amyl Methyl Ether	13.67	73	1552853	27.742	ng	100
45) 1,2-Dichloropropane	13.90	63	531954	26.765	ng	100
46) Bromodichloromethane	14.09	83	768224	28.438	ng	100
47) Trichloroethene	14.13	130	696142	26.095	ng	100
48) 1,4-Dioxane	14.11	88	495729	28.997	ng	99
49) 2,2,4-Trimethylpentane...	14.19	57	2109488	25.853	ng	100

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Data File: I:\MS16\DATA\2019 03\22\03221915.D

Acq On : 22 Mar 2019 9:09

Operator: LH

Sample : LCS R16032219 25ng

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:15:29 2019

Quant Method : I:\MS16\METHODS\R16032219.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	14.33	100	497994	60.560	ng	98
51) n-Heptane	14.45	71	508642	26.422	ng	99
52) cis-1,3-Dichloropropene	14.99	75	922521	28.810	ng	100
53) 4-Methyl-2-pentanone	15.02	58	506903	29.678	ng	99
54) trans-1,3-Dichloropropene	15.51	75	841422	30.551	ng	99
55) 1,1,2-Trichloroethane	15.69	97	577285	26.949	ng	100
58) Toluene	15.97	91	2283790	27.031	ng	100
59) 2-Hexanone	16.21	43	1158732	32.163	ng	99
60) Dibromochloromethane	16.39	129	748716	29.563	ng	100
61) 1,2-Dibromoethane	16.64	107	694744	29.075	ng	100
62) n-Butyl Acetate	16.83	43	1276739	32.994	ng	99
63) n-Octane	16.95	57	421921	27.035	ng	99
64) Tetrachloroethene	17.11	166	762809	26.473	ng	100
65) Chlorobenzene	17.77	112	1655081	26.524	ng	100
66) Ethylbenzene	18.11	91	2599834	26.221	ng	100
67) m- & p-Xylenes	18.27	91	3959846	53.958	ng	98
68) Bromoform	18.35	173	704689	30.287	ng	100
69) Styrene	18.59	104	1714965	28.532	ng	99
70) o-Xylene	18.69	91	1980145	26.595	ng	99
71) n-Nonane	18.87	43	886243	26.092	ng	99
72) 1,1,2,2-Tetrachloroethane	18.68	83	997530	26.935	ng	100
74) Cumene	19.20	105	2695476	27.088	ng	100
75) alpha-Pinene	19.54	93	1373355	27.462	ng	100
76) n-Propylbenzene	19.64	91	3141038	28.264	ng	100
77) 3-Ethyltoluene	19.73	105	2574864	26.385	ng	100
78) 4-Ethyltoluene	19.77	105	2626355	28.902	ng	100
79) 1,3,5-Trimethylbenzene	19.83	105	2350222	29.853	ng	100
80) alpha-Methylstyrene	19.97	118	1390155	32.472	ng	100
81) 2-Ethyltoluene	20.00	105	2823632	30.497	ng	100
82) 1,2,4-Trimethylbenzene	20.19	105	2150009	27.353	ng	100
83) n-Decane	20.26	57	1012848	26.790	ng	99
84) Benzyl Chloride	20.31	91	1896125	31.737	ng	100
85) 1,3-Dichlorobenzene	20.33	146	1434588	27.571	ng	100
86) 1,4-Dichlorobenzene	20.39	146	1441863	26.860	ng	100
87) sec-Butylbenzene	20.42	105	2887486	27.534	ng	100
88) 4-Isopropyltoluene (p-...	20.56	119	2732225	27.120	ng	100
89) 1,2,3-Trimethylbenzene	20.56	105	2172433	27.825	ng	100
90) 1,2-Dichlorobenzene	20.68	146	1352565	27.180	ng	100
91) d-Limonene	20.68	68	768052	27.645	ng	100
92) 1,2-Dibromo-3-Chloropr...	21.06	157	564993	31.888	ng	99
93) n-Undecane	21.34	57	1089296	27.807	ng	100
94) 1,2,4-Trichlorobenzene	22.17	180	1223303	29.919	ng	100
95) Naphthalene	22.28	128	3426712	28.797	ng	100
96) n-Dodecane	22.24	57	1114689	29.831	ng	99
97) Hexachlorobutadiene	22.58	225	766796	26.569	ng	100
98) Cyclohexanone	18.41	55	806142	29.091	ng	99
99) tert-Butylbenzene	20.19	119	2157844	27.215	ng	100
100) n-Butylbenzene	20.92	91	2297032	27.478	ng	100

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

Data File: I:\MS16\DATA\2019 03\22\03221915.D

Acq On : 22 Mar 2019 9:09

Operator: LH

Sample : LCS R16032219 25ng

Misc : S31-02111911/S31-03181911 (4/16)

ALS Vial : 2 Sample Multiplier: 1

Quant Time: Mar 22 11:15:29 2019

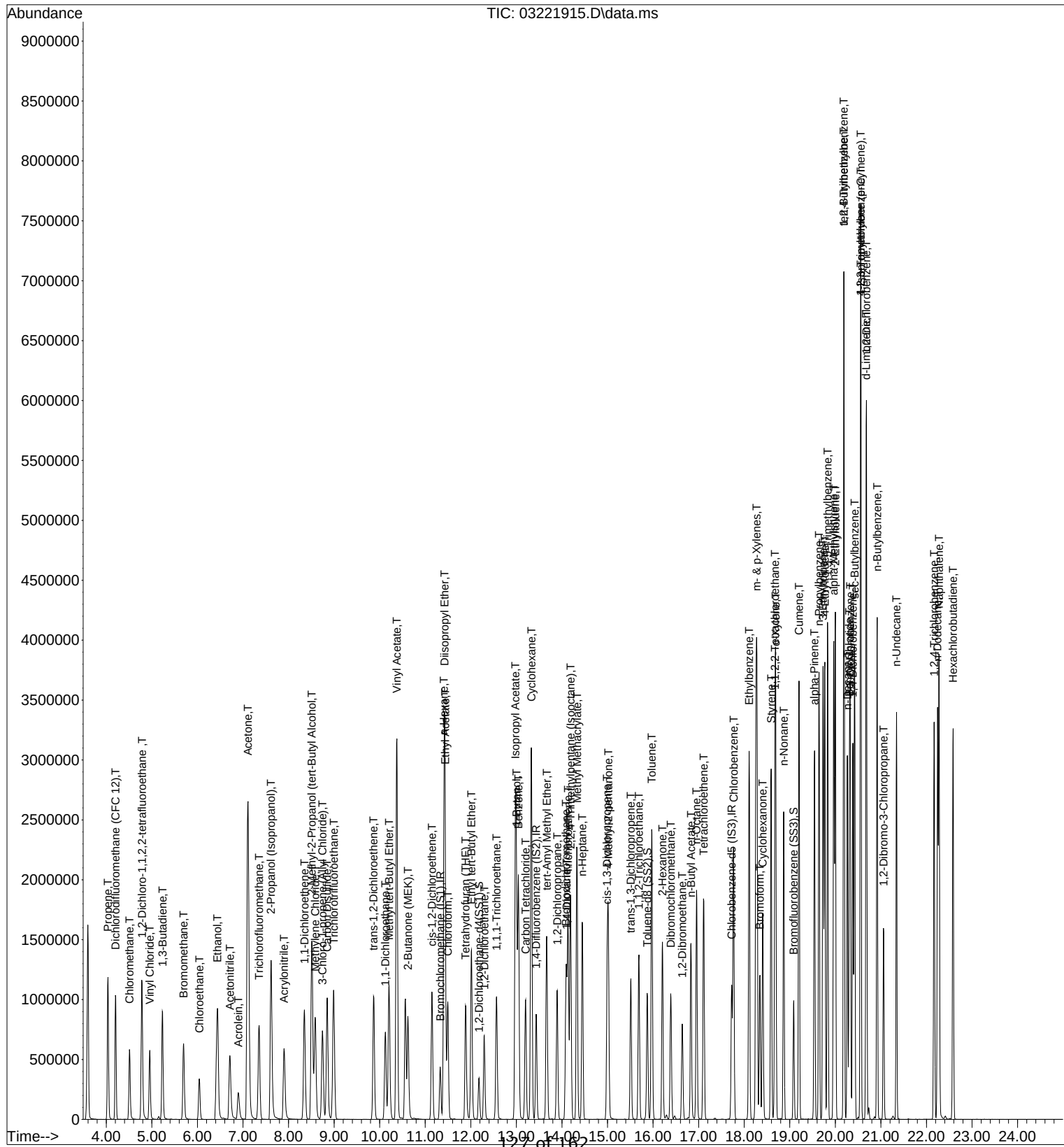
Quant Method : I:\MS16\METHODS\R16032219.M

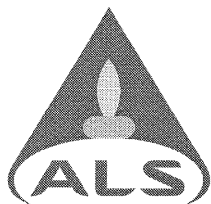
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Fri Mar 22 11:09:04 2019

Response via : Initial Calibration

DataAcq Meth:TO15.M





Instructions for Data Validation-Method TO-15 (SCAN)

Page 1 of 3

1. Determination of Pressure Dilution Factor

Upon receipt at the laboratory the pressure or vacuum of the sample canisters is measured using a digital pressure gauge. The canisters are then pressurized with humidified zero air to approximately +3.5 psig (pounds per square inch gauge).

Pressure Dilution factor is calculated as:

$$PDF = \frac{P_f + 14.7}{P_i + 14.7}$$

P_f final pressure in psig

P_i initial pressure in psig

2. Validating Initial and Continuing Calibration Results

GC/MS target compound analysis is performed using internal standard quantitation. Three internal standard compounds (Bromochloromethane, 1,4-Difluorobenzene and Chlorobenzene-d5) are added to each aliquot of sample, blank, standard and duplicate at an amount of 25 nanograms(ng). Internal standard responses are used to calculate RRFs (relative response factors) as follows:

$$RRF = \frac{A_x C_{is}}{A_{is} C_x}$$

A_x area response of the analyte quantitation ion

A_{is} area response of the corresponding internal standard quantitation ion

C_{is} internal standard concentration, ng

C_x analyte concentration, ng

The percent relative standard deviation (%RSD) for the five or six initial calibration points should be less than 30% (with a maximum of two analytes $\leq 40\%$) for the calibration to be considered valid and linear.

$$\%RSD = \frac{SD}{\overline{RRF}}(100)$$

SD standard deviation

$\overline{RRF}$ average or mean RRF (ICAL)



Instructions for Data Validation-Method TO-15 (SCAN)

Page 2 of 3

The initial calibration is verified once per twenty-four hour analytical sequence with the analysis of a continuing calibration standard at one of the initial calibration levels (actual analyte concentrations of the CCV are the same as the corresponding concentrations in the initial calibration). The relative response factor of each target analyte from the daily continuing calibration standard is compared to the average relative response factor from the initial multipoint calibration. The percent difference (%D) of the initial and continuing calibration relative response factors is calculated as follows:

$$\%D = \left(\frac{\overline{RRF} - RRF_{cont}}{\overline{RRF}} \right) (100)$$

$\overline{RRF}$ average relative response factor from the initial calibration

RRF_{cont} relative response factor from the daily continuing calibration standard

Note: the percent difference (%D) should be less than 30% for an acceptable continuing calibration standard.

3. Validating GC/MS Target Analyte Quantitation Results

Target analytes are measured in nanograms using internal standard quantitation as follows:

$$ng_x = \frac{A_x ng_{is}}{A_{is} \overline{RRF}}$$

ng_x nanogram concentration of analyte x

A_x area response of the analyte's quantitation ion

A_{is} area response of the corresponding internal standard's quantitation ion

ng_{is} internal standard amount, in nanograms

$\overline{RRF}$ average or mean RRFs (ICAL)



Instructions for Data Validation-Method TO-15 (SCAN)

Page 3 of 3

4. Calculation of $\mu\text{g}/\text{m}^3$ (microgram per cubic meter) Results

Target compound results reported on the "Results of Analysis" form in units of $\mu\text{g}/\text{m}^3$ are calculated as follows:

$$\mu\text{g}/\text{m}^3 = \frac{(ng)(PDF)}{L}$$

ng nanograms of analyte (measured on the GC/MS quantitation report)

PDF pressure dilution factor (see equation 1)

L sample aliquot in Liters

5. Conversion to ppb (parts per billion) Volume

$$C_{ppbv} = C_x \left(\frac{24.46}{FW} \right)$$

FW formula weight of the target analytes (i.e. formula weight of Dichloromethane is 84.94; 1,2-Dichloropropane is 113)

24.46 molar volume of ideal gas at 25°C and 1 atmosphere

C_x final analyte concentration calculated in equation 4 ($\mu\text{g}/\text{m}^3$)

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131910.D
 Acq On : 13 Mar 2019 15:47
 Operator : RVT
 Sample : 031319 SSC00338 23294
 Misc : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 7 Sample Multiplier: 1

RVT 3/14/19

Quant Time: Mar 13 16:10:48 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	51076	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	166059	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.71	117	136973	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	75851	925.008	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.50%	
57) Toluene-d8 (SS2)	12.61	98	168887	922.750	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.27%	
74) Bromofluorobenzene (SS3)	16.14	174	42855	1220.910	pg	0.00
Spiked Amount 1000.000			Recovery	=	122.09%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	2118	24.239	pg	# 36
3) * Dichlorodifluoromethane	3.58	85	1488	7.871	pg	# 99
4) * Chloromethane	3.71	50	793	8.033	pg	# 81
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	73	0.598	pg	# 42
7) * 1,3-Butadiene	4.01	54	102	1.452	pg	# 1
10) * Ethanol	4.43	45	2511	63.159	pg	# 98
11) * Acetonitrile	4.60	41	487	5.498	pg	# 73
12) * Acrolein	4.71	56	2162	42.883	pg	# 95
13) * Acetone	4.83	58	8520	124.248	pg	# 52
14) * Trichlorofluoromethane	4.96	101	617	4.870	pg	# 96
15) * 2-Propanol (Isopropa...	5.02	45	1463	11.024	pg	# 89
16) * Acrylonitrile	5.18	53	437	5.050	pg	# 98
17) * 1,1-Dichloroethene	5.55	96	54	0.855	pg	# 1
18) tert-Butanol	5.55	59	599	7.764	pg	# 99
19) * Methylene Chloride	5.56	84	400	5.397	pg	# 97
20) * 3-Chloro-1-propene (...)	5.68	41	71	0.996	pg	# 39
21) * Trichlorotrifluoroet...	5.81	151	113	1.928	pg	# 18
22) * Carbon Disulfide	5.83	76	2768	13.442	pg	# 98
26) * Vinyl Acetate	6.70	86	247	22.166	pg	# 18
27) * 2-Butanone (MEK)	6.97	72	471	11.350	pg	# 86
29) DIPE	7.63	45	686	3.500	pg	# 49
30) * Ethyl Acetate	7.62	61	724	47.321	pg	# 86
31) * n-Hexane	7.62	57	331	3.446	pg	# 82
32) * Chloroform	7.67	83	73	0.635	pg	# 17
34) * Tetrahydrofuran	8.13	71	76	2.265	pg	# 1
39) * Benzene	9.34	78	1007	4.348	pg	# 96
41) 1-Butanol	9.28	56	24870	53.519	pg	# 92
42) * Carbon Tetrachloride	9.52	117	88	1.915	pg	# 88
48) * 1,4-Dioxane	10.64	88	286	6.734	pg	# 89
49) Isooctane	10.72	56	322	3.494	pg	# 33
51) * n-Heptane	11.02	71	146	1.980	pg	# 40
53) * 4-Methyl-2-pentanone	11.71	58	101	2.922	pg	# 42
58) * Toluene	12.73	91	1980	8.270	pg	# 99
59) * 2-Hexanone	13.07	58	98	3.907	pg	# 64
64) * Tetrachloroethene	14.03	166	63	1.105	pg	# 10
65) * Chlorobenzene	14.75	112	51	0.393	pg	# 43
66) * Ethylbenzene	15.14	91	296	1.529	pg	# 98
67) * m- & p-Xylenes	15.30	91	744	5.107	pg	# 95
70) * Styrene	15.64	104	105	1.361	pg	# 29
71) * o-Xylene	15.74	91	281	1.834	pg	# 90
72) * n-Nonane	15.99	57	114	1.778	pg	# 80
75) * Cumene	16.27	105	51	0.292	pg	# 50
76) * alpha-Pinene	16.61	93	119	1.370	pg	# 24
77) * n-Propylbenzene	16.72	91	116	0.639	pg	# 55
78) 3-Ethyltoluene	16.85	105	76	0.539	pg	# 44

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131910.D
 Acq On : 13 Mar 2019 15:47
 Operator : RVT
 Sample : 031319 SSC00338 23294
 Misc : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 7 Sample Multiplier: 1

Quant Time: Mar 13 16:10:48 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)

79) * 4-Ethyltoluene	16.85	105	76	0.598	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.91	105	94	0.740	pg	89
82) 2-Ethyltoluene	17.07	105	105	0.695	pg	# 45
83) tert-Butylbenzene	17.28	134	106	3.737	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	318	2.616	pg	87
86) * 1,3-Dichlorobenzene	17.43	146	69	1.228	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	69	1.430	pg	# 18
88) n-Decane	17.37	85	59	3.064	pg	99
90) 1,2,3-Trimethylbenzene	17.61	105	109	0.881	pg	# 71
91) p-Isopropyltoluene	17.62	134	125	3.284	pg	76
93) * D-Limonene	17.74	68	208	4.671	pg	99
96) n-Undecane	18.42	85	117	10.496	pg	# 1
98) * Naphthalene	19.29	128	89	3.272	pg	# 67

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

Data Path : I:\MS21\DATA\2019 03\13\

Data File : 03131910.D

Acq On : 13 Mar 2019 15:47

Operator : RVT

Sample : 031319 SSC00338 23294

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Misc      : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
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ALS Vial : 7 Sample Multiplier: 1

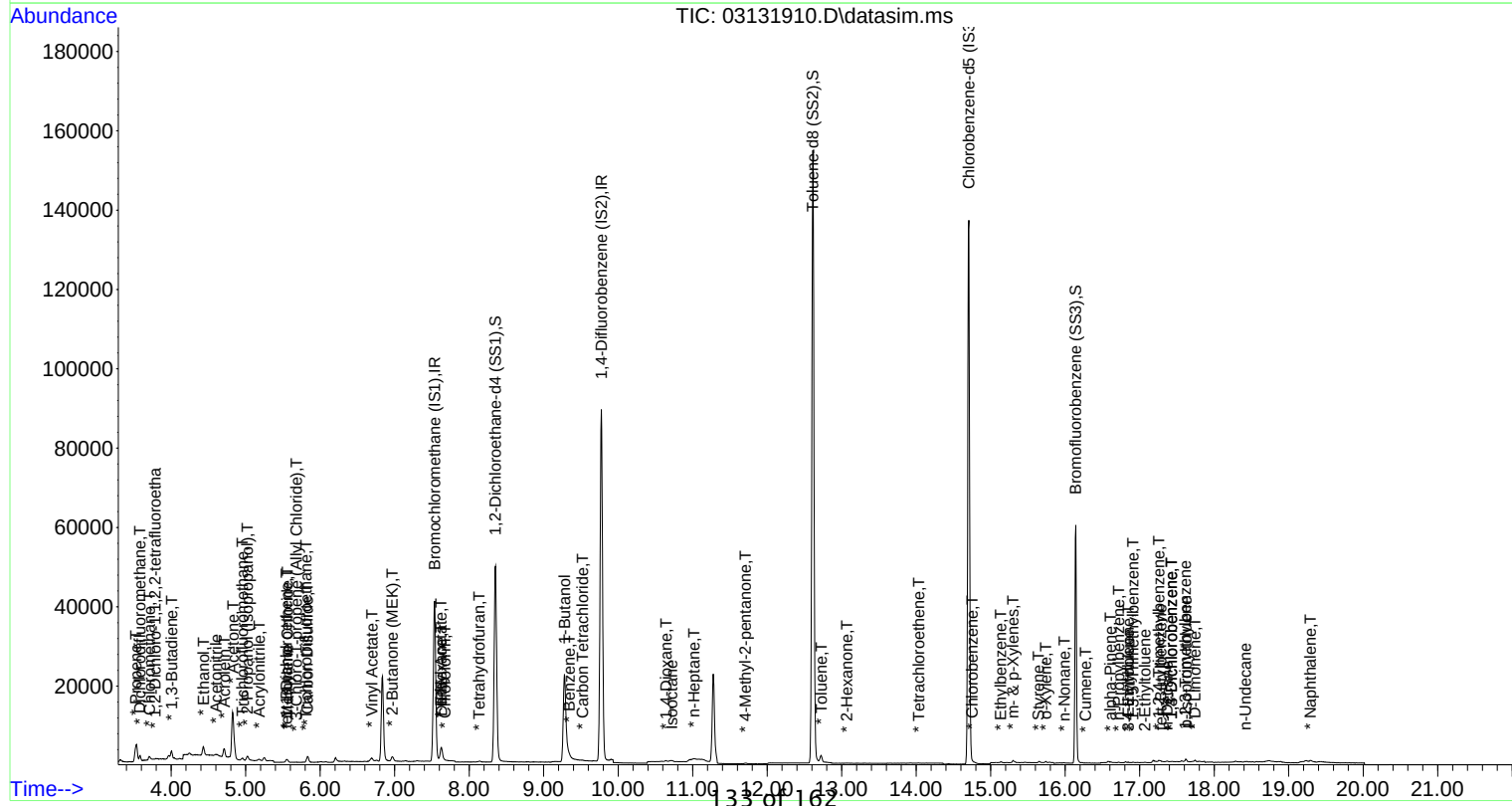
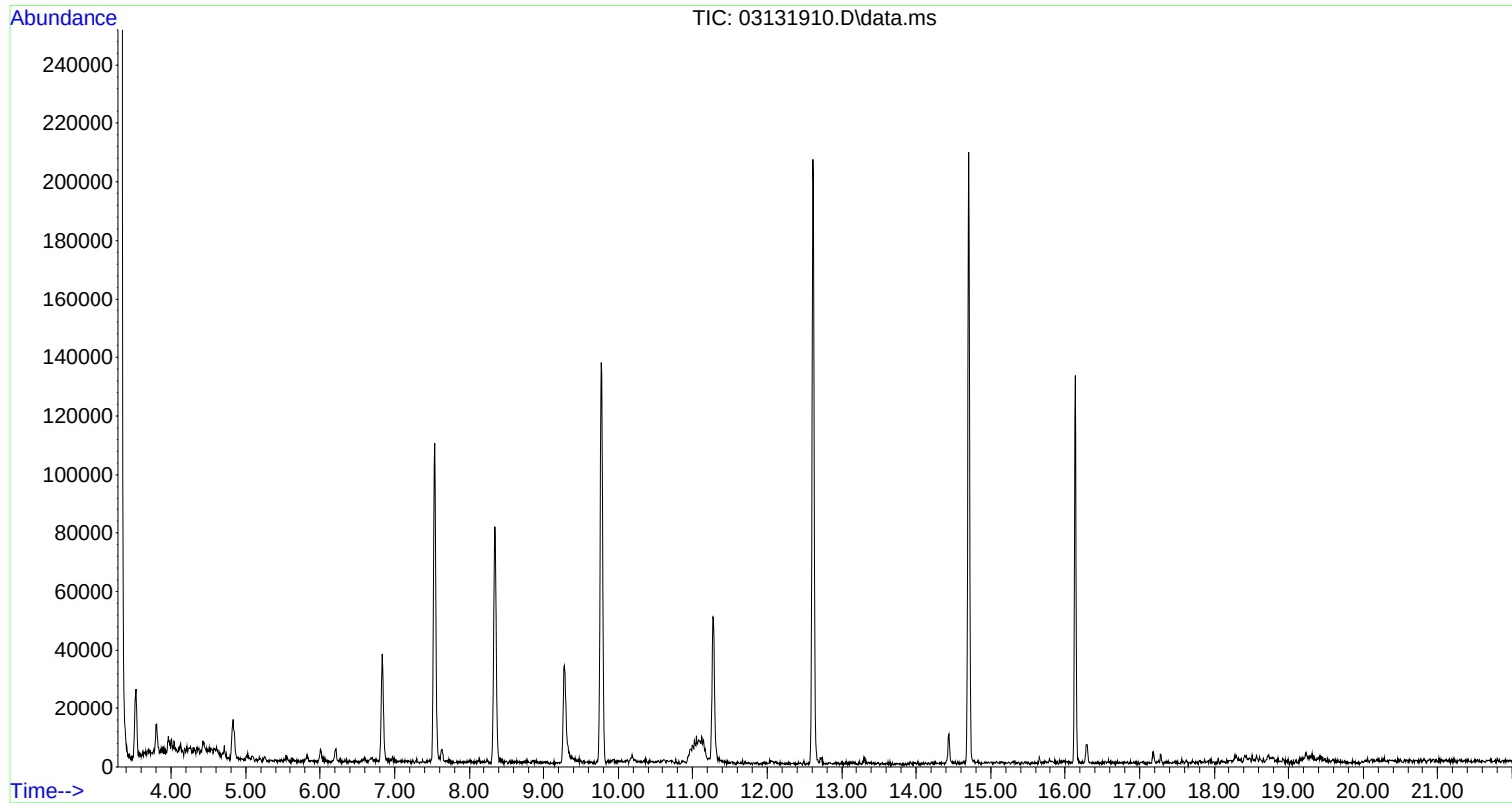
Quant Time: Mar 13 16:10:48 2019

Quant Method : I:\MS21\Methods\F21030819.M

Quant Title : EPA TO-15

QLast Update : Mon Mar 11 09:36:38 2019

Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261931.D
 Acq On : 27 Feb 2019 4:49 am
 Operator : RVT
 Sample : SC02186
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 213 Sample Multiplier: 1

RVT 2/27/19

Quant Time: Feb 27 07:38:16 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	60615	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	159881	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	134208	1000.000	pg	0.00

System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	94039	1057.495	pg	0.00
Spiked Amount 1000.000			Recovery	=	105.75%	
57) Toluene-d8 (SS2)	12.61	98	134260	937.984	pg	0.00
Spiked Amount 1000.000			Recovery	=	93.80%	
74) Bromofluorobenzene (SS3)	16.14	174	50805	901.075	pg	0.00
Spiked Amount 1000.000			Recovery	=	90.11%	

Target Compounds						Qvalue
2) * Propene	3.54	42	9562	318.619	pg	# 1
3) * Dichlorodifluoromethane	3.59	85	18162	131.156	pg	99
4) * Chloromethane	3.71	50	2618	64.617	pg	96
5) * 1,2-Dichloro-1,1,2,2...	3.80	85	435	6.224	pg	100
7) * 1,3-Butadiene	4.00	54	130	4.104	pg	# 1
8) * Bromomethane	4.21	94	146	3.733	pg	95
9) * Chloroethane	4.33	64	50	2.381	pg	# 42
10) * Ethanol	4.43	45	13571	898.725	pg	99
11) * Acetonitrile	4.60	41	23702	639.508	pg	84
12) * Acrolein	4.71	56	587	22.068	pg	84
13) * Acetone	4.82	58	19211	450.590	pg	# 48
14) * Trichlorofluoromethane	4.96	101	11143	77.980	pg	99
15) * 2-Propanol (Isopropa...	5.02	45	13794	237.113	pg	91
16) * Acrylonitrile	5.17	53	213	4.321	pg	# 66
18) tert-Butanol	5.55	59	1442	29.899	pg	# 2
19) * Methylene Chloride	5.57	84	71294	1073.291	pg	98
20) * 3-Chloro-1-propene (...)	5.63	41	110	3.303	pg	# 20
21) * Trichlorotrifluoroet...	5.81	151	2282	27.900	pg	100
22) * Carbon Disulfide	5.84	76	7396	37.116	pg	97
26) * Vinyl Acetate	6.69	86	506	62.392	pg	99
27) * 2-Butanone (MEK)	6.96	72	3009	112.154	pg	85
29) DIPE	7.62	45	2882	41.485	pg	# 38
30) * Ethyl Acetate	7.62	61	3469	327.959	pg	90
31) * n-Hexane	7.63	57	2957	65.490	pg	94
32) * Chloroform	7.67	83	912	7.812	pg	97
34) * Tetrahydrofuran	8.13	71	2802	145.657	pg	97
36) * 1,2-Dichloroethane	8.48	62	714	8.338	pg	# 88
38) * 1,1,1-Trichloroethane	8.79	97	90	1.162	pg	# 17
39) * Benzene	9.34	78	8234	45.750	pg	99
41) 1-Butanol	9.29	56	2145	106.195	pg	# 54
42) * Carbon Tetrachloride	9.52	117	2504	27.872	pg	99
43) * Cyclohexane	9.68	84	953	20.627	pg	95
45) * 1,2-Dichloropropane	10.33	63	77	1.576	pg	# 21
46) * Bromodichloromethane	10.58	83	136	1.564	pg	# 66
47) * Trichloroethene	10.60	130	68	0.989	pg	90
48) * 1,4-Dioxane	10.64	88	104	3.089	pg	# 1
49) Isooctane	10.70	56	2980	57.070	pg	# 68
51) * n-Heptane	11.02	71	1158	31.612	pg	99
53) * 4-Methyl-2-pentanone	11.71	58	179	9.136	pg	95
58) * Toluene	12.72	91	40449	244.752	pg	99
59) * 2-Hexanone	13.06	58	404	25.510	pg	# 88
62) * n-Butyl Acetate	13.81	56	116	8.952	pg	# 30
63) * n-Octane	13.92	85	298	12.536	pg	85
64) * Tetrachloroethene	14.03	166	211	2.694	pg	96
65) * Chlorobenzene	14.75	112	84	0.668	pg	# 42

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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261931.D
 Acq On : 27 Feb 2019 4:49 am
 Operator : RVT
 Sample : SC02186
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 213 Sample Multiplier: 1

Quant Time: Feb 27 07:38:16 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
66) * Ethylbenzene	15.14	91	2898	23.333	pg	98
67) * m- & p-Xylenes	15.30	91	6588	68.626	pg	98
69) Cyclohexanone	15.45	98	131	8.195	pg	# 67
70) * Styrene	15.64	104	279	5.089	pg	88
71) * o-Xylene	15.73	91	2337	23.323	pg	99
72) * n-Nonane	15.98	57	341	11.599	pg	99
75) * Cumene	16.27	105	222	1.386	pg	92
76) * alpha-Pinene	16.61	93	3004	56.527	pg	95
77) * n-Propylbenzene	16.72	91	529	3.720	pg	98
78) 3-Ethyltoluene	16.81	105	1269	10.990	pg	100
79) * 4-Ethyltoluene	16.84	105	643	6.164	pg	96
80) * 1,3,5-Trimethylbenzene	16.91	105	529	4.864	pg	93
82) 2-Ethyltoluene	17.07	105	483	3.912	pg	96
83) tert-Butylbenzene	17.28	134	509	19.406	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	1620	17.331	pg	# 84
86) * 1,3-Dichlorobenzene	17.43	146	338	4.632	pg	96
87) * 1,4-Dichlorobenzene	17.43	146	338	5.890	pg	93
88) n-Decane	17.37	85	148	10.860	pg	94
90) 1,2,3-Trimethylbenzene	17.61	105	530	5.201	pg	# 53
91) p-Isopropyltoluene	17.62	134	766	25.520	pg	93
93) * D-Limonene	17.74	68	3483	142.360	pg	93
94) n-Butylbenzene	18.02	134	51	2.528	pg	83
96) n-Undecane	18.41	85	50	6.932	pg	94
98) * Naphthalene	19.29	128	115	4.481	pg	# 65

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

Data Path : I:\MS21\DATA\2019 02\22\
 Data File : 02221934.D
 Acq On : 23 Feb 2019 6:11 am
 Operator : RVT
 Sample : AC02376 OA02091
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 211 Sample Multiplier: 1

RVT 2/26/19

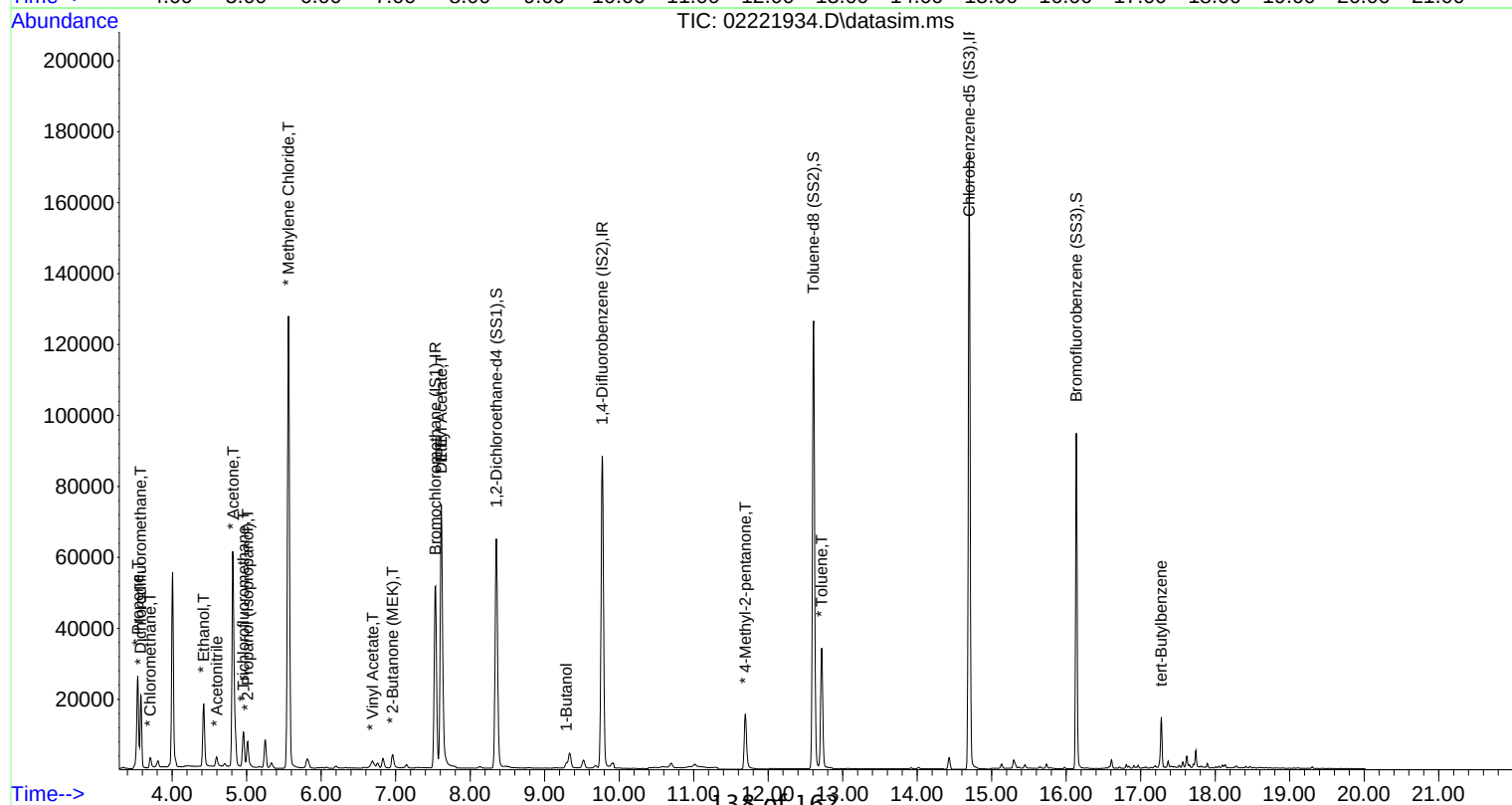
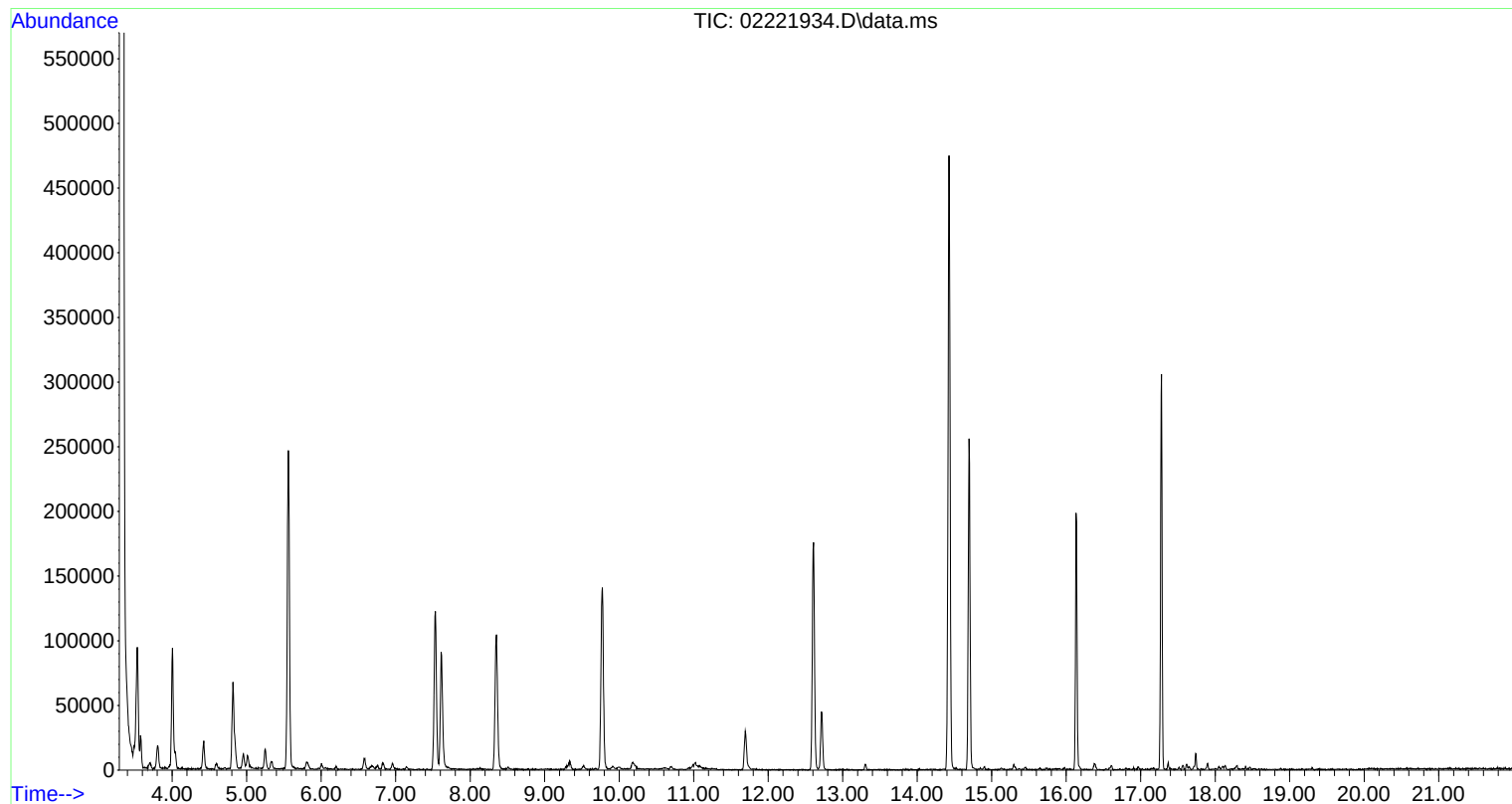
Quant Time: Feb 25 07:41:23 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	65158	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	166898	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	177267	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	99037	1036.048	pg	0.00
Spiked Amount 1000.000			Recovery	=	103.60%	
57) Toluene-d8 (SS2)	12.61	98	144065	762.005	pg	0.00
Spiked Amount 1000.000			Recovery	=	76.20%	
74) Bromofluorobenzene (SS3)	16.14	174	68411	918.610	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.86%	
Target Compounds						
					Qvalue	
2) * Propene	3.54	42	7938	246.063	pg	# 1
3) * Dichlorodifluoromethane	3.58	85	21568	144.893	pg	99
4) * Chloromethane	3.70	50	3145	72.212	pg	96
10) * Ethanol	4.42	45	19271	1187.222	pg	99
11) * Acetonitrile	4.60	41	3322	83.382	pg	# 82
13) * Acetone	4.82	58	31212	681.029	pg	87
14) * Trichlorofluoromethane	4.95	101	11466	74.645	pg	100
15) * 2-Propanol (Isopropa...	5.01	45	8356	133.621	pg	96
19) * Methylene Chloride	5.56	84	149699	2096.504	pg	98
26) * Vinyl Acetate	6.69	86	755	86.605	pg	68
27) * 2-Butanone (MEK)	6.96	72	1919	66.540	pg	87
29) DIPE	7.61	45	15718	210.477	pg	# 37
30) * Ethyl Acetate	7.61	61	19444	1710.068	pg	86
41) 1-Butanol	9.29	56	1536	72.847	pg	# 62
53) * 4-Methyl-2-pentanone	11.70	58	9702	474.355	pg	91
58) * Toluene	12.72	91	42060	192.681	pg	99
83) tert-Butylbenzene	17.28	134	5455	157.455	pg	# 1

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

Data Path : I:\MS21\DATA\2019 02\22\
Data File : 02221934.D
Acq On : 23 Feb 2019 6:11 am
Operator : RVT
Sample : AC02376 OA02091
Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
ALS Vial : 211 Sample Multiplier: 1

Quant Time: Feb 25 07:41:23 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration



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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261922.D
 Acq On : 26 Feb 2019 10:31 pm
 Operator : RVT
 Sample : SC00071 FCA00061
 Misc : 97318(CAN ONLY) (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 204 Sample Multiplier: 1

RVT 2/27/19

Quant Time: Feb 27 07:37:22 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	51482	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	141055	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	113996	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	75530	1000.033	pg	0.00
Spiked Amount 1000.000			Recovery	=	100.00%	
57) Toluene-d8 (SS2)	12.61	98	106389	875.053	pg	0.00
Spiked Amount 1000.000			Recovery	=	87.50%	
74) Bromofluorobenzene (SS3)	16.14	174	52434	1094.854	pg	0.00
Spiked Amount 1000.000			Recovery	=	109.48%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	1310	51.395	pg	# 38
3) * Dichlorodifluoromethane	3.59	85	965	8.205	pg	94
4) * Chloromethane	3.71	50	730	21.214	pg	97
7) * 1,3-Butadiene	3.99	54	61	2.267	pg	# 1
8) * Bromomethane	4.21	94	81	2.439	pg	# 75
9) * Chloroethane	4.35	64	282	15.810	pg	# 87
10) * Ethanol	4.43	45	4111	320.544	pg	98
11) * Acetonitrile	4.60	41	823	26.145	pg	# 71
12) * Acrolein	4.71	56	1358	60.110	pg	86
13) * Acetone	4.82	58	25660	708.620	pg	76
14) * Trichlorofluoromethane	4.96	101	567	4.672	pg	97
15) * 2-Propanol (Isopropa...	5.01	45	4162	84.235	pg	93
16) * Acrylonitrile	5.18	53	205	4.896	pg	# 72
18) tert-Butanol	5.54	59	1563	38.158	pg	87
19) * Methylene Chloride	5.57	84	4166	73.843	pg	100
21) * Trichlorotrifluoroet...	5.82	151	113	1.627	pg	99
22) * Carbon Disulfide	5.83	76	4250	25.112	pg	97
26) * Vinyl Acetate	6.69	86	1096	159.117	pg	# 18
27) * 2-Butanone (MEK)	6.96	72	4546	199.502	pg	97
29) DIPE	7.63	45	439	7.440	pg	# 32
30) * Ethyl Acetate	7.62	61	575	64.004	pg	98
31) * n-Hexane	7.63	57	429	11.187	pg	94
32) * Chloroform	7.67	83	78	0.787	pg	# 17
34) * Tetrahydrofuran	8.12	71	16897	1034.180	pg	99
39) * Benzene	9.34	78	1420	8.943	pg	100
41) 1-Butanol	9.28	56	4963	278.503	pg	# 44
42) * Carbon Tetrachloride	9.52	117	124	1.564	pg	88
48) * 1,4-Dioxane	10.64	88	552	18.582	pg	94
49) Isooctane	10.69	56	250	5.427	pg	89
51) * n-Heptane	11.02	71	660	20.422	pg	# 85
53) * 4-Methyl-2-pentanone	11.70	58	235	13.595	pg	98
58) * Toluene	12.73	91	4140	29.492	pg	99
59) * 2-Hexanone	13.06	58	585	43.488	pg	99
63) * n-Octane	13.92	85	115	5.696	pg	93
64) * Tetrachloroethene	14.02	166	154	2.315	pg	# 58
65) * Chlorobenzene	14.75	112	60	0.562	pg	# 42
66) * Ethylbenzene	15.14	91	1564	14.825	pg	98
67) * m- & p-Xylenes	15.29	91	6173	75.704	pg	98
69) Cyclohexanone	15.45	98	238	17.528	pg	# 68
70) * Styrene	15.64	104	125	2.685	pg	92
71) * o-Xylene	15.73	91	2438	28.645	pg	99
72) * n-Nonane	15.98	57	149	5.967	pg	88
75) * Cumene	16.27	105	217	1.595	pg	91
76) * alpha-Pinene	16.61	93	201	4.453	pg	99
77) * n-Propylbenzene	16.72	91	963	7.973	pg	99

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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261922.D
 Acq On : 26 Feb 2019 10:31 pm
 Operator : RVT
 Sample : SC00071 FCA00061
 Misc : 97318(CAN ONLY) (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 204 Sample Multiplier: 1

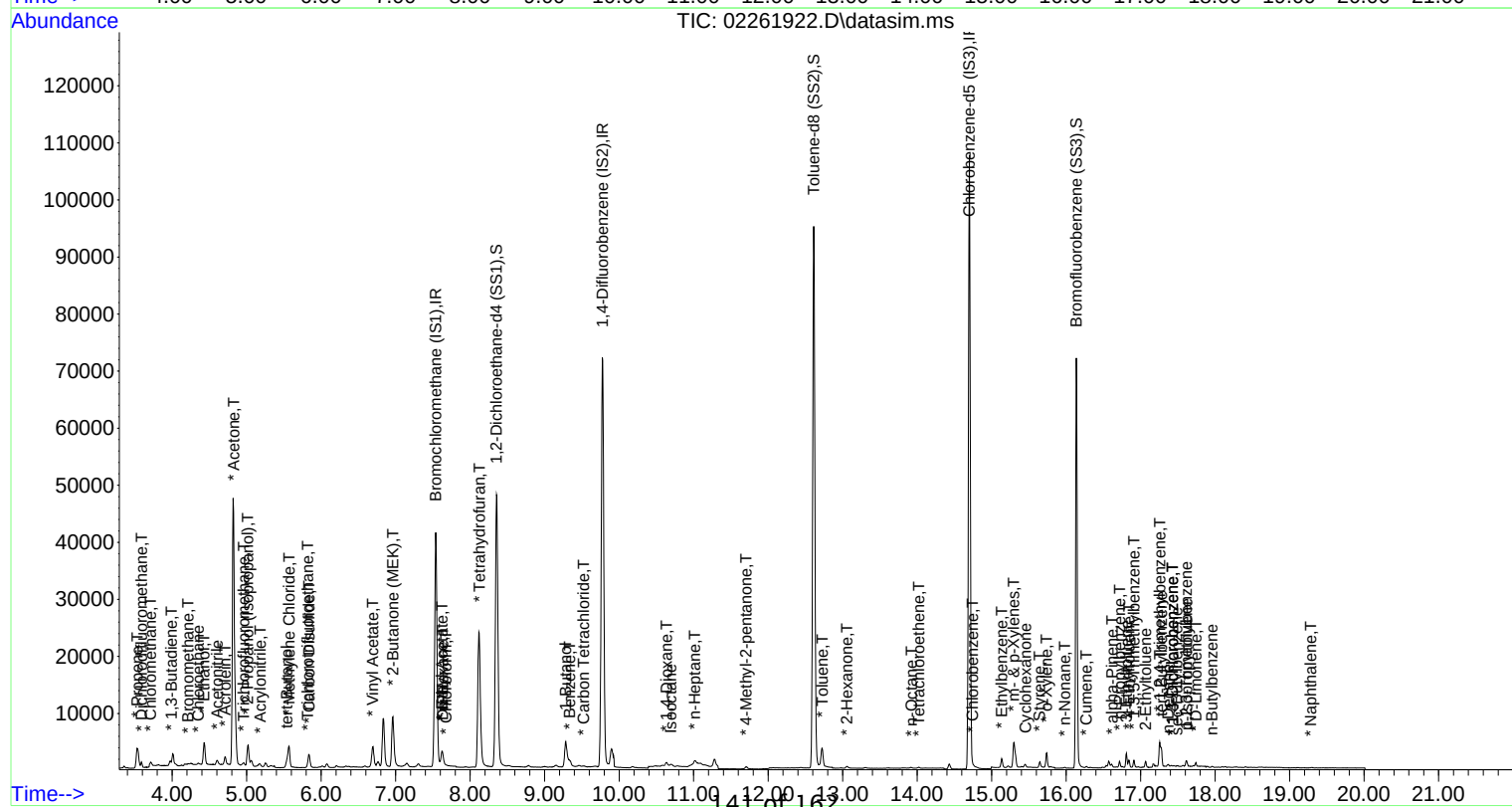
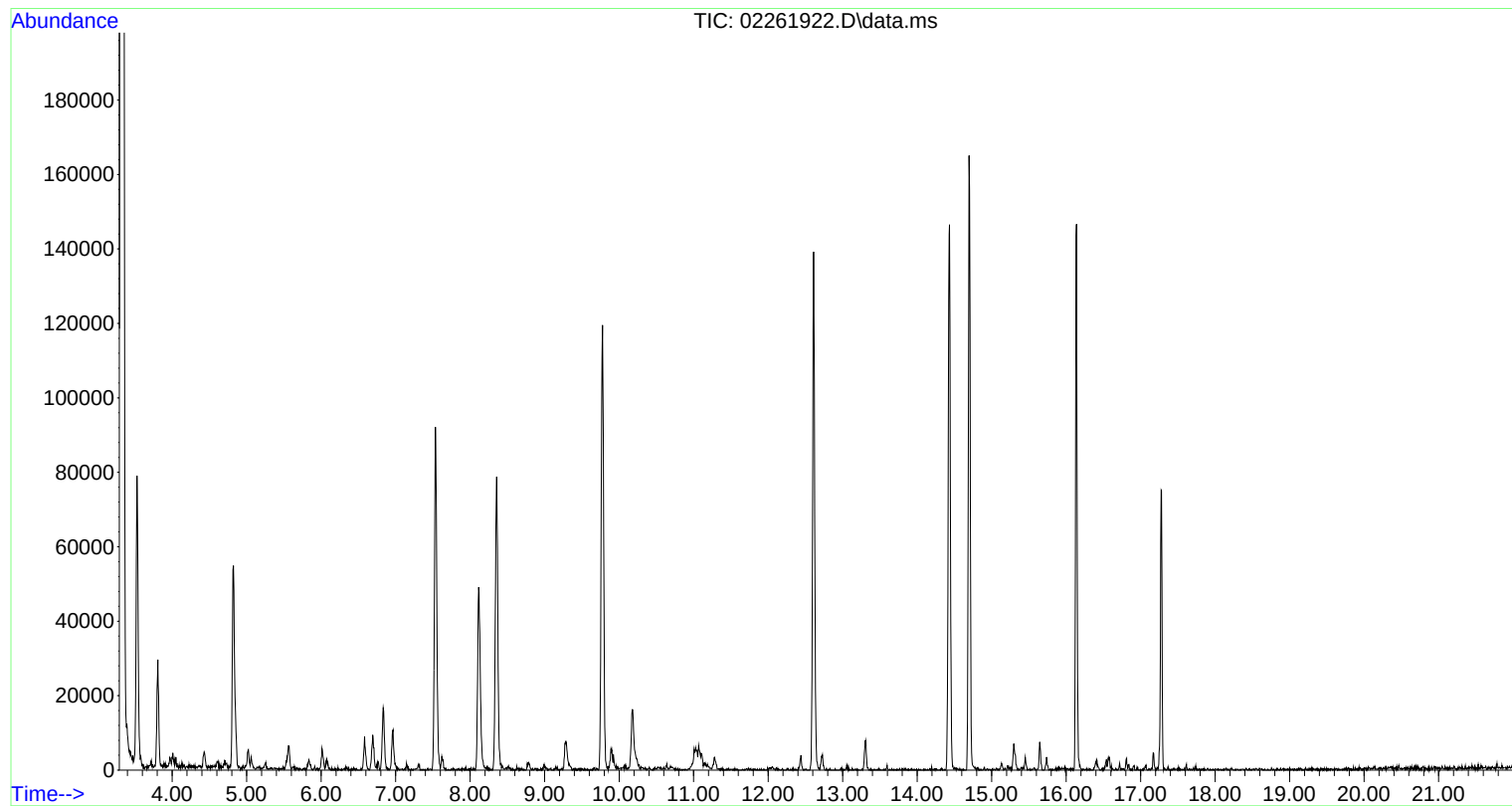
Quant Time: Feb 27 07:37:22 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
78) 3-Ethyltoluene	16.81	105	2061	21.013	pg	98
79) * 4-Ethyltoluene	16.84	105	945	10.666	pg	98
80) * 1,3,5-Trimethylbenzene	16.91	105	892	9.655	pg	98
82) 2-Ethyltoluene	17.07	105	915	8.725	pg	100
83) tert-Butylbenzene	17.28	134	1250	56.106	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	3422	43.100	pg	88
86) * 1,3-Dichlorobenzene	17.43	146	66	1.065	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	66	1.354	pg	# 17
88) n-Decane	17.37	85	96	8.293	pg	82
89) sec-Butylbenzene	17.48	105	83	0.692	pg	# 56
90) 1,2,3-Trimethylbenzene	17.61	105	529	6.111	pg	94
91) p-Isopropyltoluene	17.62	134	122	4.785	pg	97
93) * D-Limonene	17.74	68	254	12.222	pg	95
94) n-Butylbenzene	17.96	134	85	4.960	pg	# 25
98) * Naphthalene	19.28	128	64	2.936	pg	# 65

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

Data Path : I:\MS21\DATA\2019 02\26\
Data File : 02261922.D
Acq On : 26 Feb 2019 10:31 pm
Operator : RVT
Sample : SC00071 FCA00061
Misc : 97318(CAN ONLY) (Sig #1); S31-02131901 (Sig #2)
ALS Vial : 204 Sample Multiplier: 1

Quant Time: Feb 27 07:37:22 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\21\
 Data File : 02211930.D
 Acq On : 22 Feb 2019 4:52 am
 Operator : RVT
 Sample : AC02395 OA01829
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 211 Sample Multiplier: 1

RVT 2/26/19

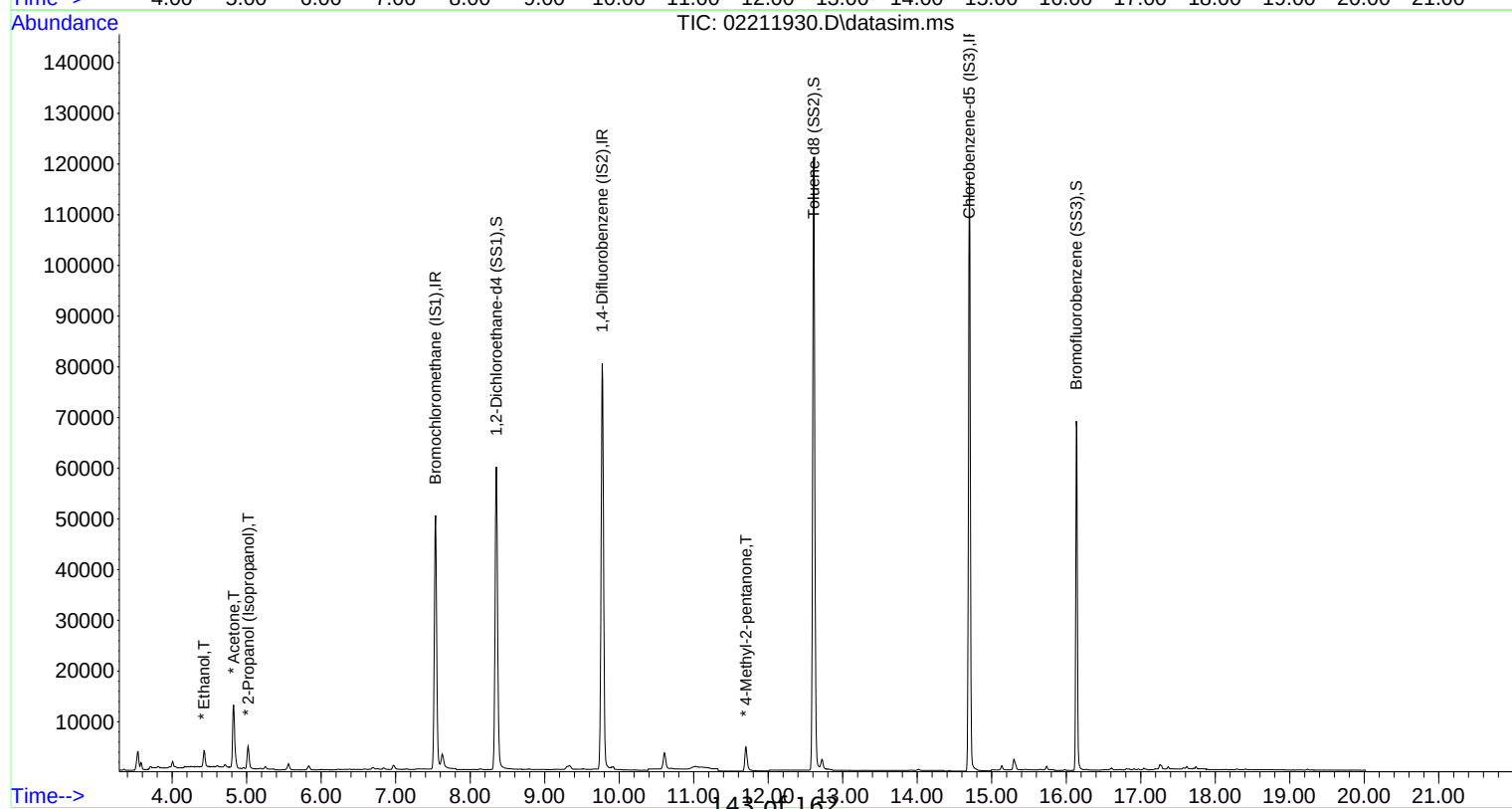
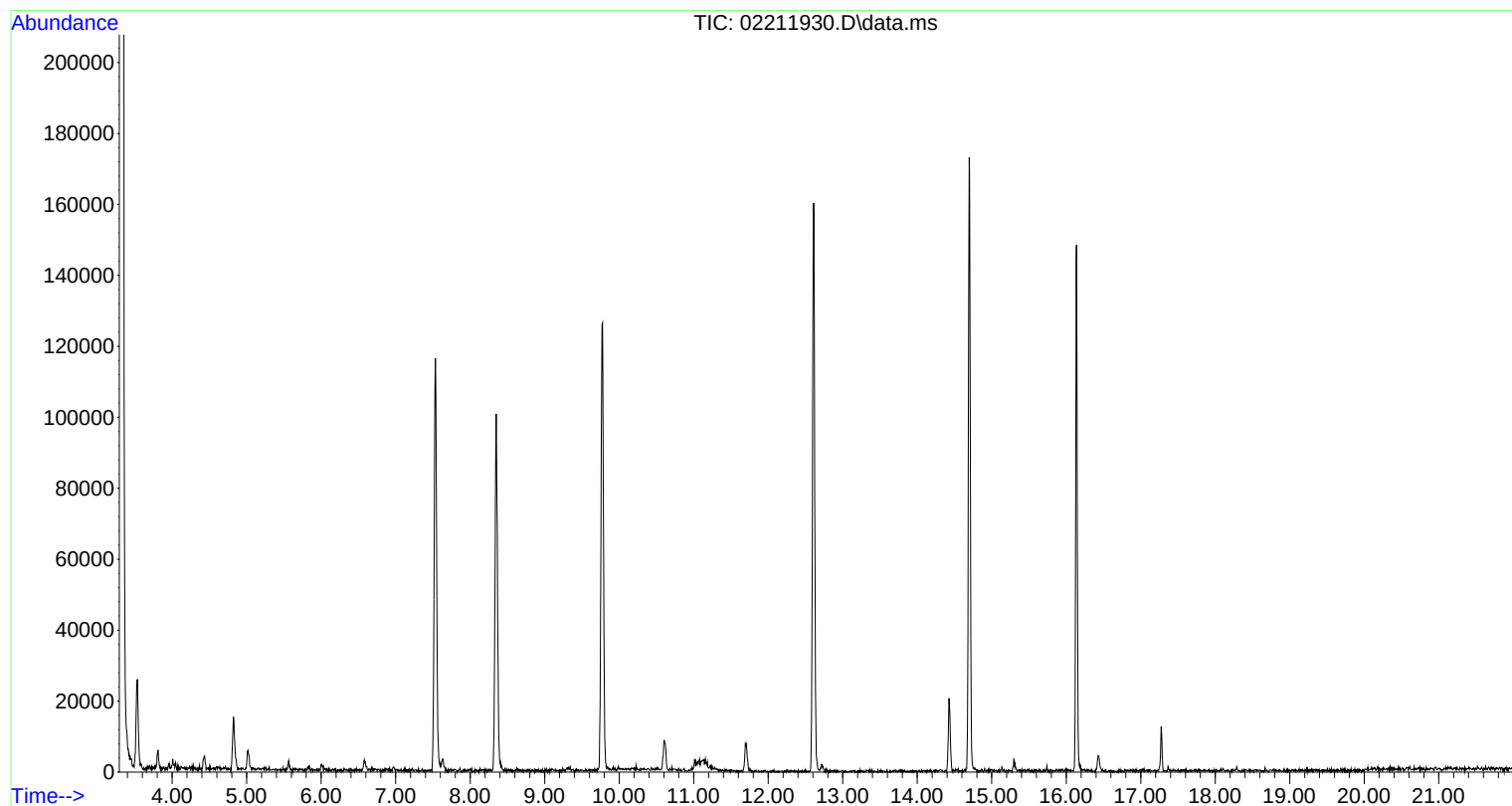
Quant Time: Feb 22 07:48:23 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	63561	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	152462	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	122891	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	93058	997.960	pg	0.00
Spiked Amount 1000.000			Recovery	=	99.80%	
57) Toluene-d8 (SS2)	12.61	98	132936	1014.261	pg	0.00
Spiked Amount 1000.000			Recovery	=	101.43%	
74) Bromofluorobenzene (SS3)	16.14	174	51339	994.398	pg	0.00
Spiked Amount 1000.000			Recovery	=	99.44%	
Target Compounds						Qvalue
10) * Ethanol	4.43	45	3473	219.336	pg	99
13) * Acetone	4.82	58	6648	148.700	pg	80
15) * 2-Propanol (Isopropa...	5.02	45	4953	81.194	pg	96
53) * 4-Methyl-2-pentanone	11.70	58	2960	158.425	pg	95

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

Data Path : I:\MS21\DATA\2019 02\21\
Data File : 02211930.D
Acq On : 22 Feb 2019 4:52 am
Operator : RVT
Sample : AC02395 OA01829
Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
ALS Vial : 211 Sample Multiplier: 1

Quant Time: Feb 22 07:48:23 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration



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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261918.D
 Acq On : 26 Feb 2019 7:45 pm
 Operator : RVT
 Sample : SSC00054 OA01245
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 16 Sample Multiplier: 1

RVT 2/27/19

Quant Time: Feb 27 07:36:58 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	55596	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	163681	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	108434	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.36	65	79343	972.782	pg	0.00
Spiked Amount 1000.000			Recovery	=	97.28%	
57) Toluene-d8 (SS2)	12.61	98	113313	979.809	pg	0.00
Spiked Amount 1000.000			Recovery	=	97.98%	
74) Bromofluorobenzene (SS3)	16.14	174	49203	1080.088	pg	0.00
Spiked Amount 1000.000			Recovery	=	108.01%	
Target Compounds						
2) * Propene	3.54	42	1705	61.942	pg	# 35
3) * Dichlorodifluoromethane	3.59	85	1003	7.897	pg	99
4) * Chloromethane	3.71	50	347	9.338	pg	100
7) * 1,3-Butadiene	4.00	54	39	1.342	pg	# 1
10) * Ethanol	4.43	45	6894	497.763	pg	100
11) * Acetonitrile	4.60	41	6973	205.124	pg	84
12) * Acrolein	4.72	56	489	20.043	pg	93
13) * Acetone	4.83	58	5859	149.828	pg	98
14) * Trichlorofluoromethane	4.97	101	530	4.044	pg	97
15) * 2-Propanol (Isopropa...	5.02	45	7858	147.270	pg	99
16) * Acrylonitrile	5.18	53	117	2.588	pg	99
18) tert-Butanol	5.54	59	462	10.444	pg	89
19) * Methylene Chloride	5.57	84	3590	58.924	pg	99
21) * Trichlorotrifluoroet...	5.82	151	157	2.093	pg	# 18
22) * Carbon Disulfide	5.84	76	33805	184.963	pg	98
24) * 1,1-Dichloroethane	6.59	63	77	1.045	pg	# 43
26) * Vinyl Acetate	6.70	86	371	49.876	pg	# 1
27) * 2-Butanone (MEK)	6.97	72	2218	90.134	pg	94
29) DIPE	7.63	45	466	7.313	pg	# 32
30) * Ethyl Acetate	7.63	61	662	68.235	pg	93
31) * n-Hexane	7.63	57	190	4.588	pg	# 78
32) * Chloroform	7.68	83	55	0.514	pg	# 17
34) * Tetrahydrofuran	8.13	71	949	53.785	pg	89
39) * Benzene	9.34	78	1255	6.811	pg	96
41) 1-Butanol	9.28	56	20927	1012.006	pg	# 46
42) * Carbon Tetrachloride	9.52	117	171	1.859	pg	91
48) * 1,4-Dioxane	10.64	88	73	2.118	pg	# 17
49) Isooctane	10.69	56	140	2.619	pg	83
51) * n-Heptane	11.02	71	203	5.413	pg	# 42
53) * 4-Methyl-2-pentanone	11.70	58	75	3.739	pg	# 32
58) * Toluene	12.73	91	2685	20.108	pg	98
63) * n-Octane	13.92	85	65	3.384	pg	# 10
65) * Chlorobenzene	14.75	112	52	0.512	pg	# 42
66) * Ethylbenzene	15.14	91	280	2.790	pg	100
67) * m- & p-Xylenes	15.30	91	773	9.966	pg	97
71) * o-Xylene	15.74	91	260	3.212	pg	96
72) * n-Nonane	15.98	57	111	4.673	pg	# 71
76) * alpha-Pinene	16.61	93	255	5.939	pg	99
77) * n-Propylbenzene	16.72	91	91	0.792	pg	# 52
78) 3-Ethyltoluene	16.81	105	189	2.026	pg	100
79) * 4-Ethyltoluene	16.81	105	189	2.243	pg	98
80) * 1,3,5-Trimethylbenzene	16.91	105	101	1.149	pg	# 29
82) 2-Ethyltoluene	17.07	105	68	0.682	pg	# 43
83) tert-Butylbenzene	17.28	134	282	13.307	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	324	4.290	pg	89

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Data Path : I:\MS21\DATA\2019 02\26\
Data File : 02261918.D
Acq On : 26 Feb 2019 7:45 pm
Operator : RVT
Sample : SSC00054 OA01245
Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
ALS Vial : 16 Sample Multiplier: 1

Quant Time: Feb 27 07:36:58 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
90) 1,2,3-Trimethylbenzene	17.61	105	86	1.044	pg	# 60
91) p-Isopropyltoluene	17.62	134	133	5.484	pg	80
93) * D-Limonene	17.74	68	726	36.727	pg	98

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

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131911.D
 Acq On : 13 Mar 2019 16:29
 Operator : RVT
 Sample : 031319 SSC00299 23296
 Misc : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 8 Sample Multiplier: 1

RVT 3/14/19

Quant Time: Mar 14 07:34:39 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	50605	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	165066	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.71	117	136418	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	74907	921.998	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.20%	
57) Toluene-d8 (SS2)	12.61	98	167503	918.911	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.89%	
74) Bromofluorobenzene (SS3)	16.14	174	42772	1223.503	pg	0.00
Spiked Amount 1000.000			Recovery	=	122.35%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	1774	20.491	pg	# 32
3) * Dichlorodifluoromethane	3.58	85	649	3.465	pg	100
4) * Chloromethane	3.70	50	682	6.973	pg	94
6) * Vinyl Chloride	3.90	62	57	0.613	pg	# 1
7) * 1,3-Butadiene	4.00	54	215	3.090	pg	# 1
10) * Ethanol	4.43	45	1468	37.268	pg	95
11) * Acetonitrile	4.60	41	621	7.077	pg	# 53
12) * Acrolein	4.71	56	2183	43.702	pg	85
13) * Acetone	4.83	58	8192	120.577	pg	# 48
14) * Trichlorofluoromethane	4.96	101	276	2.199	pg	98
15) * 2-Propanol (Isopropa...	5.02	45	3102	23.593	pg	96
16) * Acrylonitrile	5.18	53	348	4.059	pg	91
18) tert-Butanol	5.55	59	604	7.902	pg	# 80
19) * Methylene Chloride	5.56	84	214	2.914	pg	# 80
22) * Carbon Disulfide	5.83	76	3329	16.317	pg	98
26) * Vinyl Acetate	6.70	86	188	17.028	pg	# 47
27) * 2-Butanone (MEK)	6.97	72	528	12.842	pg	# 59
29) DIPE	7.63	45	249	1.282	pg	# 49
30) * Ethyl Acetate	7.63	61	193	12.732	pg	85
31) * n-Hexane	7.63	57	73	0.767	pg	# 60
32) * Chloroform	7.66	83	53	0.465	pg	# 16
34) * Tetrahydrofuran	8.13	71	61	1.835	pg	# 1
39) * Benzene	9.34	78	3307	14.366	pg	100
41) 1-Butanol	9.28	56	22883	49.539	pg	94
48) * 1,4-Dioxane	10.64	88	252	5.969	pg	# 82
49) Isooctane	10.71	56	86	0.939	pg	# 39
51) * n-Heptane	11.02	71	157	2.142	pg	# 84
53) * 4-Methyl-2-pentanone	11.71	58	112	3.260	pg	# 42
58) * Toluene	12.72	91	1006	4.219	pg	91
64) * Tetrachloroethene	14.03	166	339	5.971	pg	99
65) * Chlorobenzene	14.75	112	89	0.689	pg	# 43
66) * Ethylbenzene	15.13	91	234	1.214	pg	99
67) * m- & p-Xylenes	15.31	91	526	3.625	pg	95
70) * Styrene	15.64	104	88	1.145	pg	# 29
71) * o-Xylene	15.74	91	206	1.350	pg	# 79
72) * n-Nonane	15.98	57	158	2.475	pg	98
77) * n-Propylbenzene	16.72	91	95	0.525	pg	# 1
78) 3-Ethyltoluene	16.85	105	56	0.399	pg	# 44
79) * 4-Ethyltoluene	16.85	105	56	0.443	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.91	105	61	0.482	pg	# 30
82) 2-Ethyltoluene	17.07	105	60	0.399	pg	# 45
83) tert-Butylbenzene	17.28	134	142	5.027	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	300	2.478	pg	# 82
86) * 1,3-Dichlorobenzene	17.43	146	76	1.358	pg	88
87) * 1,4-Dichlorobenzene	17.43	146	76	1.582	pg	87

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Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131911.D
 Acq On : 13 Mar 2019 16:29
 Operator : RVT
 Sample : 031319 SSC00299 23296
 Misc : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 8 Sample Multiplier: 1

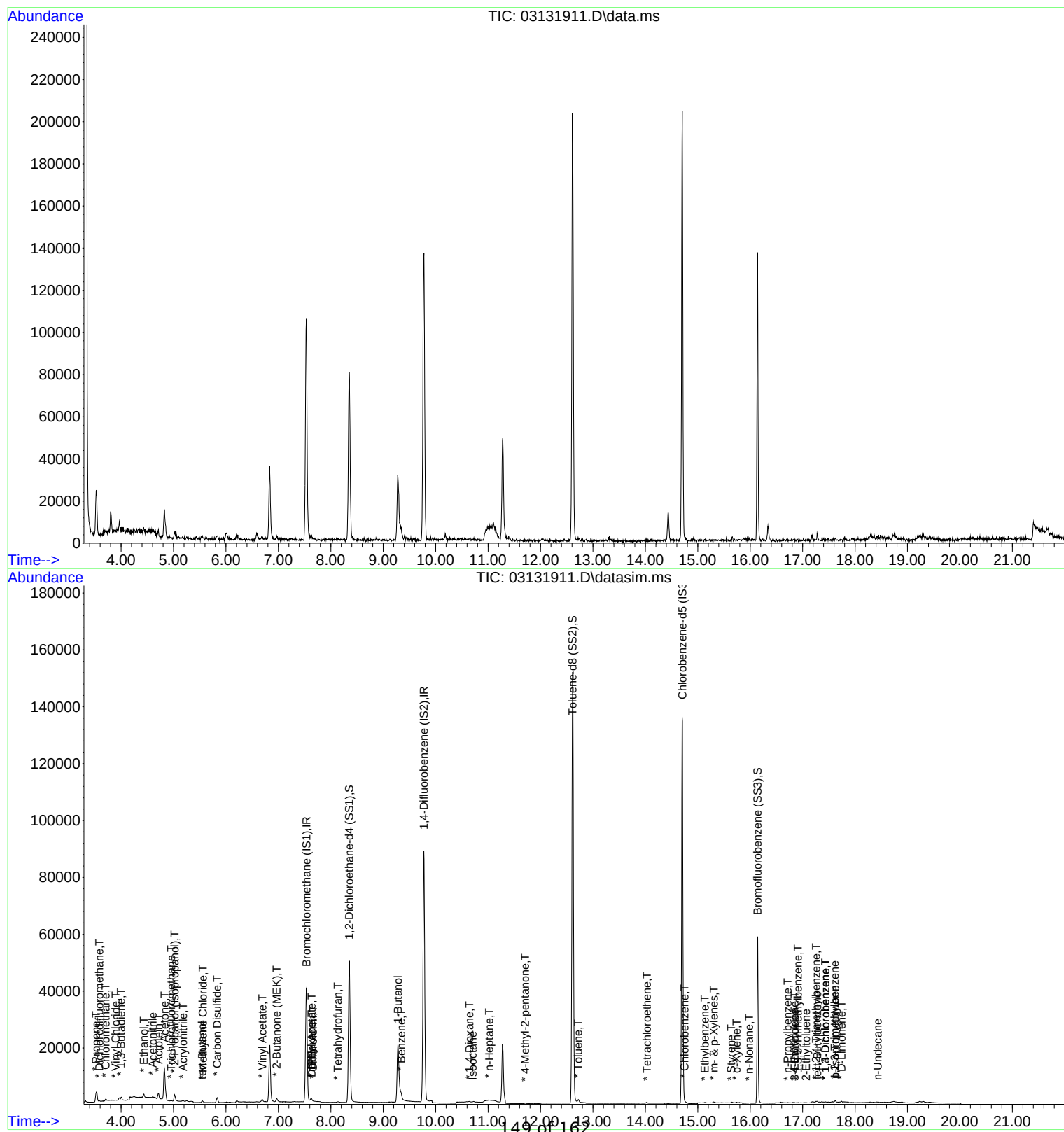
Quant Time: Mar 14 07:34:39 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
90) 1,2,3-Trimethylbenzene	17.61	105	102	0.828	pg	# 61
91) p-Isopropyltoluene	17.62	134	85	2.242	pg	98
93) * D-Limonene	17.74	68	168	3.788	pg	92
96) n-Undecane	18.43	85	150	13.511	pg	# 1

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

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131911.D
 Acq On : 13 Mar 2019 16:29
 Operator : RVT
 Sample : 031319 SSC00299 23296
 Misc : LL+TICS // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 14 07:34:39 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261914.D
 Acq On : 26 Feb 2019 4:59 pm
 Operator : RVT
 Sample : CHAMBER QC SC01757
 Misc : PASS (LL+TICS) // 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 12 Sample Multiplier: 1

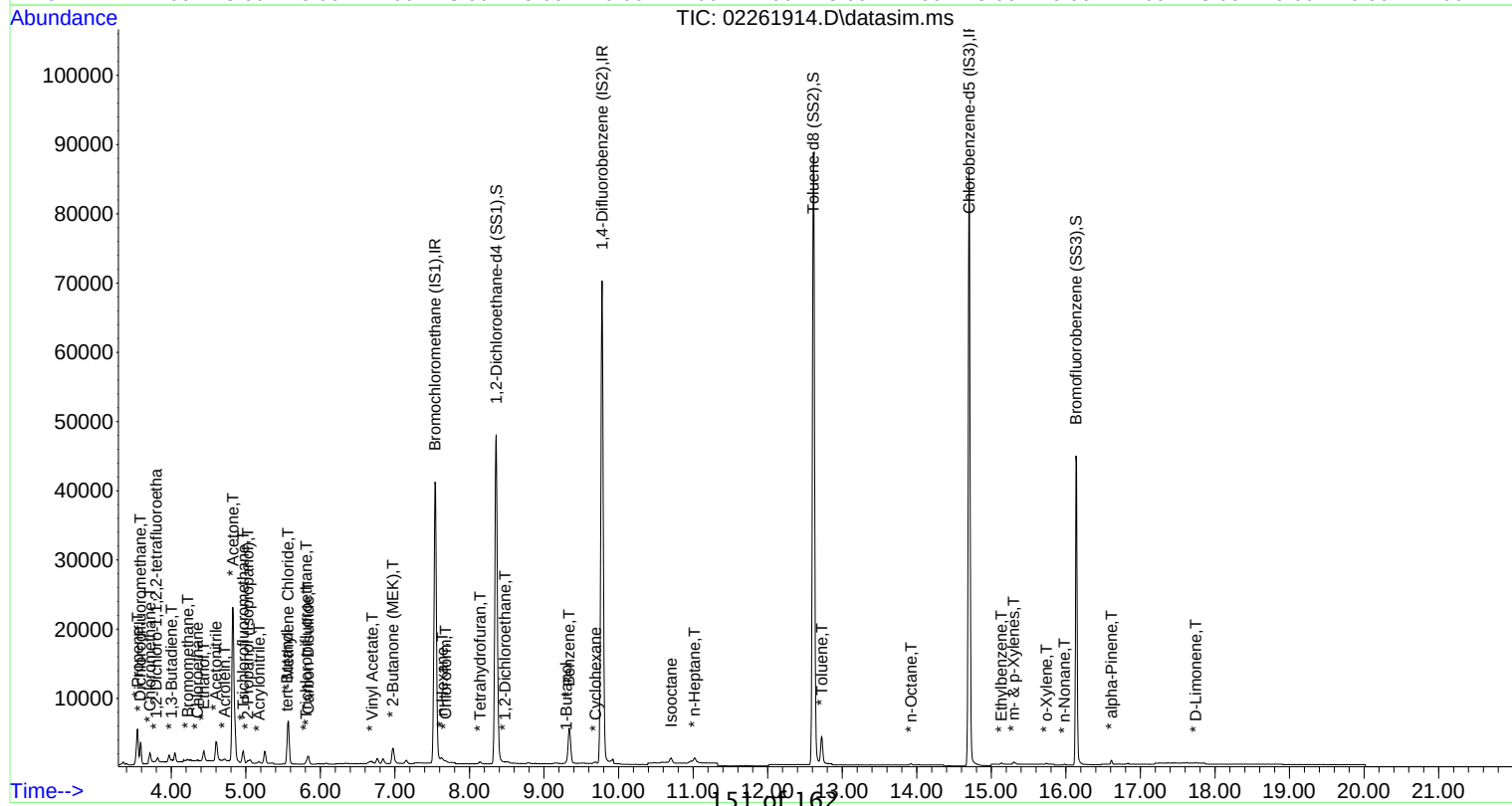
RVT 2/27/19

Quant Time: Feb 27 07:36:34 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	51868	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	132207	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	91767	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.36	65	74675	981.355	pg	0.00
Spiked Amount 1000.000			Recovery	=	98.14%	
57) Toluene-d8 (SS2)	12.61	98	99940	1021.127	pg	0.00
Spiked Amount 1000.000			Recovery	=	102.11%	
74) Bromofluorobenzene (SS3)	16.14	174	33264	862.821	pg	0.00
Spiked Amount 1000.000			Recovery	=	86.28%	
Target Compounds						
						Qvalue
2) * Propene	3.55	42	1500	58.411	pg	# 1
3) * Dichlorodifluoromethane	3.59	85	3285	27.723	pg	99
4) * Chloromethane	3.71	50	1539	44.391	pg	90
5) * 1,2-Dichloro-1,1,2,2...	3.80	85	108	1.806	pg	# 42
7) * 1,3-Butadiene	4.00	54	46	1.697	pg	# 1
8) * Bromomethane	4.22	94	177	5.289	pg	# 79
9) * Chloroethane	4.35	64	124	6.900	pg	# 42
10) * Ethanol	4.44	45	1513	117.094	pg	98
11) * Acetonitrile	4.60	41	3764	118.684	pg	84
12) * Acrolein	4.71	56	260	11.423	pg	98
13) * Acetone	4.82	58	8943	245.130	pg	# 67
14) * Trichlorofluoromethane	4.97	101	1997	16.332	pg	100
15) * 2-Propanol (Isopropa...	5.03	45	746	14.986	pg	# 77
16) * Acrylonitrile	5.18	53	152	3.603	pg	95
18) tert-Butanol	5.55	59	205	4.967	pg	# 76
19) * Methylene Chloride	5.57	84	7334	129.029	pg	99
21) * Trichlorotrifluoroet...	5.81	151	397	5.672	pg	94
22) * Carbon Disulfide	5.84	76	1978	11.600	pg	100
26) * Vinyl Acetate	6.70	86	64	9.222	pg	# 13
27) * 2-Butanone (MEK)	6.97	72	1272	55.406	pg	91
31) * n-Hexane	7.63	57	560	14.494	pg	96
32) * Chloroform	7.68	83	280	2.803	pg	92
34) * Tetrahydrofuran	8.14	71	191	11.603	pg	95
36) * 1,2-Dichloroethane	8.47	62	165	2.252	pg	# 1
39) * Benzene	9.34	78	9623	64.660	pg	100
41) 1-Butanol	9.30	56	106	6.346	pg	# 45
43) * Cyclohexane	9.69	84	156	4.083	pg	97
49) Isooctane	10.70	56	498	11.534	pg	82
51) * n-Heptane	11.02	71	436	14.394	pg	93
58) * Toluene	12.73	91	4758	42.105	pg	100
63) * n-Octane	13.92	85	169	10.397	pg	99
66) * Ethylbenzene	15.13	91	229	2.697	pg	100
67) * m- & p-Xylenes	15.30	91	475	7.236	pg	100
71) * o-Xylene	15.74	91	128	1.868	pg	98
72) * n-Nonane	15.98	57	114	5.671	pg	91
76) * alpha-Pinene	16.61	93	379	10.430	pg	86
93) * D-Limonene	17.74	68	50	2.989	pg	# 4

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

Quant Time: Feb 27 07:36:34 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261933.D
 Acq On : 27 Feb 2019 6:13 am
 Operator : RVT
 Sample : SC02181
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 215 Sample Multiplier: 1

RVT 2/27/19

Quant Time: Feb 27 07:38:28 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	96168	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	285639	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.72	117	201906	1000.000	pg	0.02

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.36	65	155271	1100.551	pg	0.00
Spiked Amount 1000.000			Recovery	=	110.05%	
57) Toluene-d8 (SS2)	12.66	98	224796	1043.918	pg	0.04
Spiked Amount 1000.000			Recovery	=	104.39%	
74) Bromofluorobenzene (SS3)	16.15	174	57114	673.327	pg	0.00
Spiked Amount 1000.000			Recovery	=	67.33%	

Target Compounds

						Qvalue
2) * Propene	3.54	42	12062	253.333	pg	# 1
3) * Dichlorodifluoromethane	3.59	85	22945	104.439	pg	99
4) * Chloromethane	3.71	50	3417	53.158	pg	95
5) * 1,2-Dichloro-1,1,2,2...	3.80	85	581	5.240	pg	97
7) * 1,3-Butadiene	4.00	54	186	3.701	pg	# 1
8) * Bromomethane	4.21	94	211	3.401	pg	82
10) * Ethanol	4.43	45	18963	791.538	pg	99
11) * Acetonitrile	4.60	41	32288	549.100	pg	84
12) * Acrolein	4.71	56	1168	27.677	pg	93
13) * Acetone	4.82	58	29598	437.566	pg	# 60
14) * Trichlorofluoromethane	4.97	101	14616	64.470	pg	100
15) * 2-Propanol (Isopropa...	5.02	45	16379	177.460	pg	90
16) * Acrylonitrile	5.17	53	476	6.086	pg	# 65
18) tert-Butanol	5.54	59	2120	27.707	pg	# 1
19) * Methylene Chloride	5.57	84	106088	1006.654	pg	98
20) * 3-Chloro-1-propene (...)	5.62	41	212	4.013	pg	# 20
21) * Trichlorotrifluoroet...	5.81	151	3099	23.882	pg	98
22) * Carbon Disulfide	5.84	76	12574	39.773	pg	99
24) * 1,1-Dichloroethane	6.58	63	50	0.392	pg	# 43
26) * Vinyl Acetate	6.69	86	788	61.243	pg	76
27) * 2-Butanone (MEK)	6.96	72	4223	99.212	pg	87
29) DIPE	7.62	45	4630	42.007	pg	# 38
30) * Ethyl Acetate	7.62	61	5464	325.593	pg	86
31) * n-Hexane	7.63	57	4934	68.877	pg	96
32) * Chloroform	7.67	83	1361	7.349	pg	97
34) * Tetrahydrofuran	8.13	71	4017	131.617	pg	100
36) * 1,2-Dichloroethane	8.48	62	932	6.860	pg	# 70
38) * 1,1,1-Trichloroethane	8.80	97	131	0.947	pg	# 17
39) * Benzene	9.34	78	12936	40.231	pg	100
41) 1-Butanol	9.29	56	2647	73.352	pg	# 54
42) * Carbon Tetrachloride	9.52	117	3407	21.227	pg	96
43) * Cyclohexane	9.69	84	1454	17.615	pg	93
45) * 1,2-Dichloropropane	10.33	63	135	1.547	pg	# 82
46) * Bromodichloromethane	10.53	83	128	0.824	pg	90
47) * Trichloroethene	10.62	130	78	0.635	pg	# 48
48) * 1,4-Dioxane	10.64	88	210	3.491	pg	# 79
49) Isooctane	10.70	56	4875	52.257	pg	# 67
51) * n-Heptane	11.02	71	1594	24.357	pg	98
53) * 4-Methyl-2-pentanone	11.75	58	250	7.142	pg	# 83
58) * Toluene	12.76	91	60802	244.549	pg	100
59) * 2-Hexanone	13.11	58	506	21.238	pg	# 53
60) * Dibromochloromethane	13.21	129	60	0.677	pg	# 11
62) * n-Butyl Acetate	13.86	56	87	4.463	pg	# 30
63) * n-Octane	13.96	85	465	13.003	pg	90
64) * Tetrachloroethene	14.06	166	306	2.597	pg	98

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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261933.D
 Acq On : 27 Feb 2019 6:13 am
 Operator : RVT
 Sample : SC02181
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 215 Sample Multiplier: 1

Quant Time: Feb 27 07:38:28 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
65) * Chlorobenzene	14.76	112	103	0.544	pg	# 42
66) * Ethylbenzene	15.15	91	3624	19.395	pg	98
67) * m- & p-Xylenes	15.31	91	8762	60.669	pg	99
68) * Bromoform	15.35	173	70	1.064	pg	# 26
69) Cyclohexanone	15.52	98	110	4.574	pg	96
70) * Styrene	15.65	104	280	3.395	pg	# 81
71) * o-Xylene	15.74	91	3554	23.577	pg	98
72) * n-Nonane	15.99	57	430	9.722	pg	100
75) * Cumene	16.28	105	222	0.921	pg	92
76) * alpha-Pinene	16.62	93	1419	17.749	pg	91
77) * n-Propylbenzene	16.72	91	595	2.781	pg	98
78) 3-Ethyltoluene	16.85	105	798	4.594	pg	91
79) * 4-Ethyltoluene	16.85	105	798	5.085	pg	93
80) * 1,3,5-Trimethylbenzene	16.92	105	567	3.465	pg	97
81) alpha-Methylstyrene	17.05	118	85	1.235	pg	# 49
82) 2-Ethyltoluene	17.07	105	604	3.252	pg	100
83) tert-Butylbenzene	17.28	134	154	3.903	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	1619	11.513	pg	90
86) * 1,3-Dichlorobenzene	17.43	146	221	2.013	pg	# 81
87) * 1,4-Dichlorobenzene	17.43	146	221	2.560	pg	# 78
88) n-Decane	17.37	85	143	6.975	pg	91
89) sec-Butylbenzene	17.49	105	65	0.306	pg	# 56
90) 1,2,3-Trimethylbenzene	17.61	105	591	3.855	pg	# 39
91) p-Isopropyltoluene	17.62	134	1087	24.072	pg	89
93) * D-Limonene	17.74	68	2061	55.994	pg	89
96) n-Undecane	18.41	85	53	4.884	pg	# 32

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

Data Path : I:\MS21\DATA\2019 02\26\

Data File : 02261933.D

Acq On : 27 Feb 2019 6:13 am

Operator : RVT

Sample : SC02181

Misc : 97318 (Sig #1); S31-02131901 (Sig #2)

ALS Vial : 215 Sample Multiplier: 1

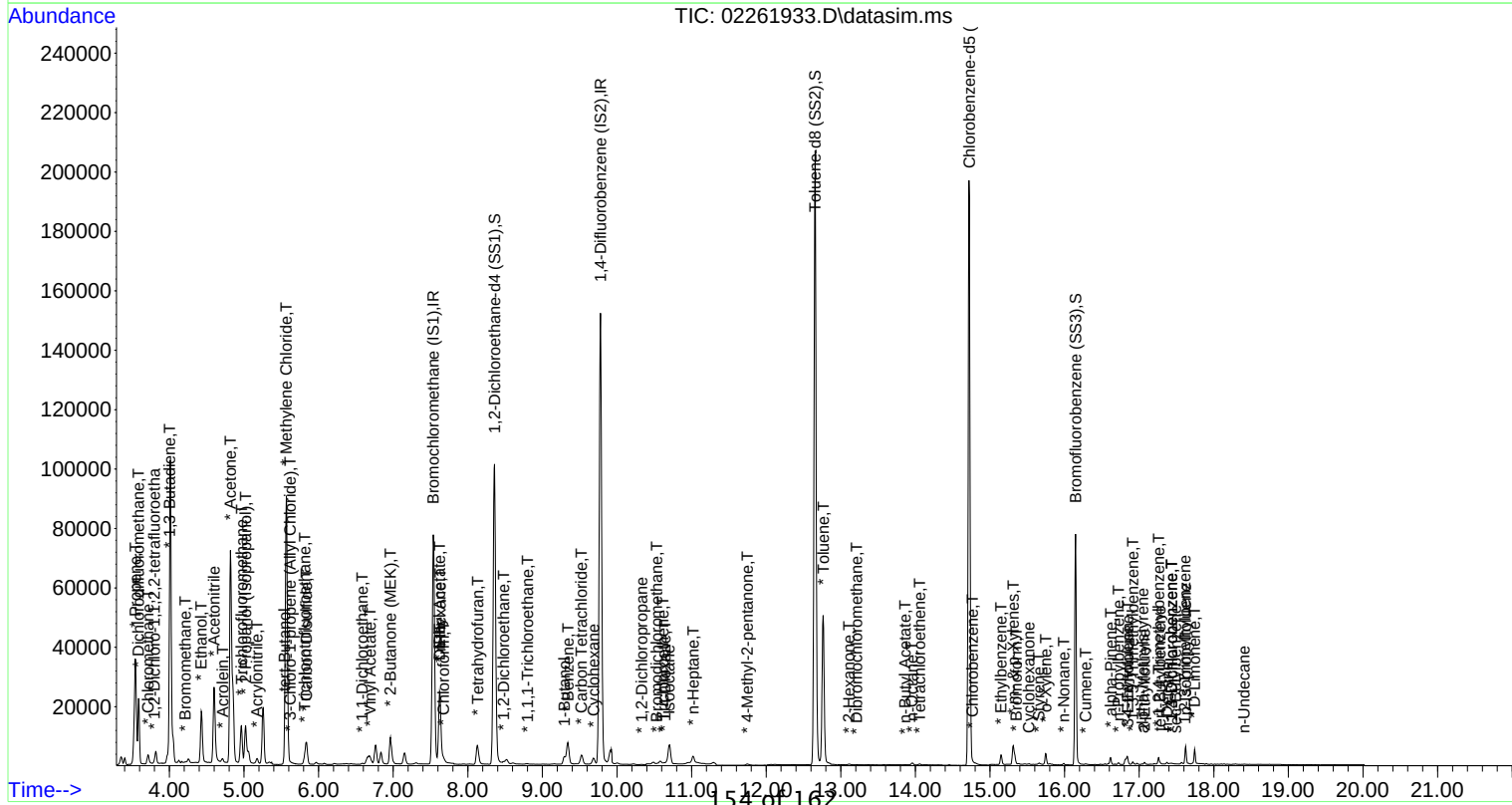
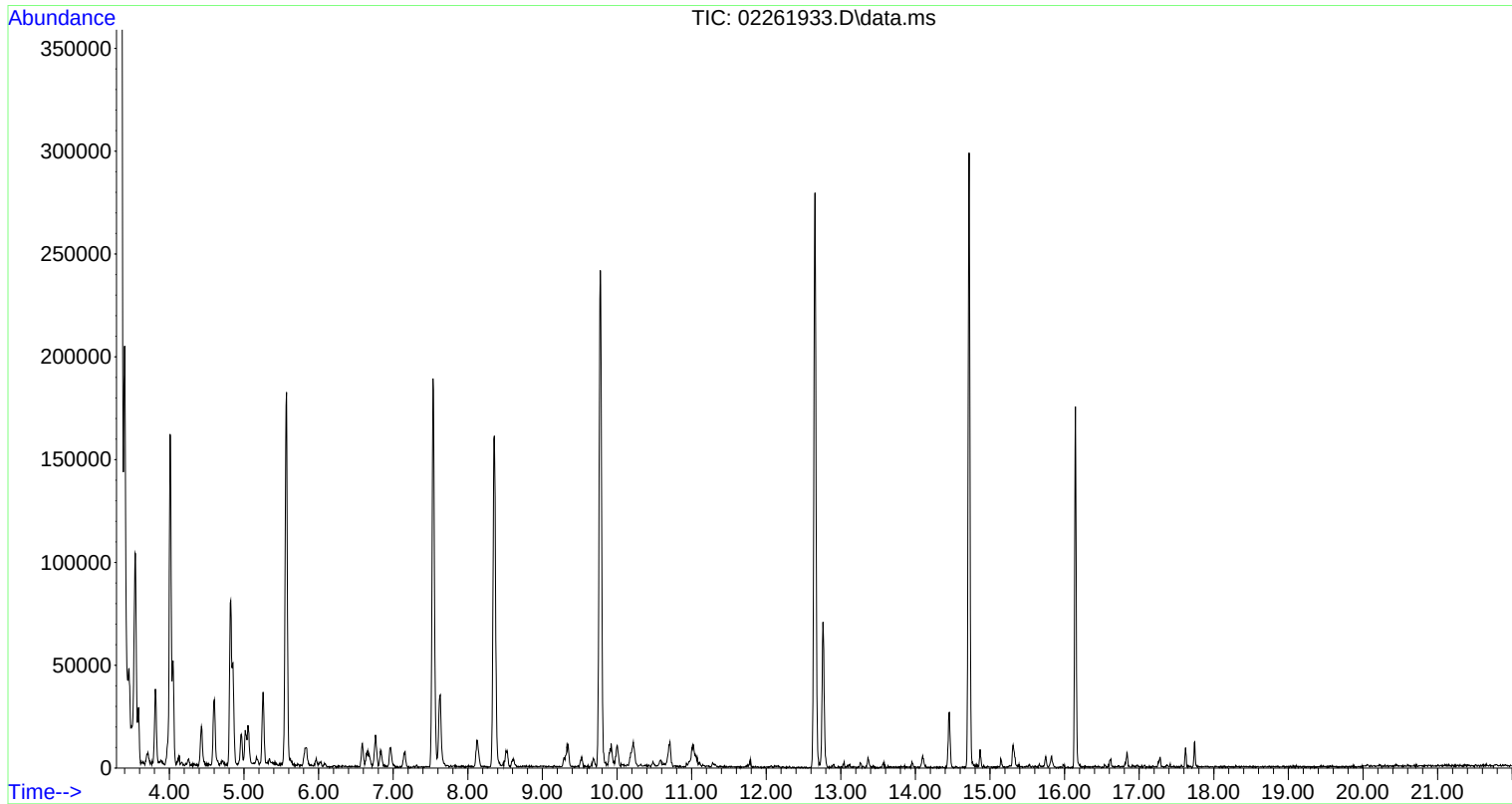
Quant Time: Feb 27 07:38:28 2019

Quant Method : I:\MS21\Methods\F2101182019.M

Quant Title : EPA TO-15

QLast Update : Thu Jan 31 07:44:10 2019

Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131909.D
 Acq On : 13 Mar 2019 15:06
 Operator : RVT
 Sample : 031319 AS00312 23295
 Misc : LL ONLY // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 6 Sample Multiplier: 1

RVT 3/14/19

Quant Time: Mar 13 15:59:07 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	47478	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	154064	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	142478	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	69700	914.411	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.44%	
57) Toluene-d8 (SS2)	12.61	98	157299	826.230	pg	0.00
Spiked Amount 1000.000			Recovery	=	82.62%	
74) Bromofluorobenzene (SS3)	16.14	174	43428	1189.431	pg	0.00
Spiked Amount 1000.000			Recovery	=	118.94%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	2676	32.946	pg	# 54
3) * Dichlorodifluoromethane	3.58	85	679	3.864	pg	99
4) * Chloromethane	3.70	50	2945	32.094	pg	98
7) * 1,3-Butadiene	4.00	54	230	3.523	pg	# 1
8) * Bromomethane	4.21	94	6054	86.153	pg	98
9) * Chloroethane	4.34	64	238	5.446	pg	# 83
10) * Ethanol	4.43	45	3628	98.171	pg	99
11) * Acetonitrile	4.60	41	1901	23.089	pg	99
12) * Acrolein	4.71	56	13044	278.332	pg	90
13) * Acetone	4.82	58	30034	471.182	pg	71
14) * Trichlorofluoromethane	4.96	101	242	2.055	pg	94
15) * 2-Propanol (Isopropa...	5.01	45	19852	160.932	pg	89
16) * Acrylonitrile	5.18	53	769	9.561	pg	98
18) tert-Butanol	5.53	59	1165	16.245	pg	86
19) * Methylene Chloride	5.57	84	233	3.382	pg	90
22) * Carbon Disulfide	5.83	76	40683	212.536	pg	96
24) * 1,1-Dichloroethane	6.57	63	223	2.189	pg	# 43
26) * Vinyl Acetate	6.69	86	1258	121.449	pg	# 13
27) * 2-Butanone (MEK)	6.97	72	2286	59.260	pg	82
29) DIPE	7.62	45	550	3.019	pg	# 49
30) * Ethyl Acetate	7.63	61	650	45.704	pg	# 79
31) * n-Hexane	7.62	57	328	3.673	pg	# 60
32) * Chloroform	7.67	83	88	0.823	pg	# 75
34) * Tetrahydrofuran	8.13	71	354	11.350	pg	81
36) * 1,2-Dichloroethane	8.47	62	118	1.508	pg	# 1
39) * Benzene	9.34	78	11888	55.332	pg	99
41) 1-Butanol	9.27	56	38675	89.707	pg	89
47) * Trichloroethene	10.60	130	889	16.410	pg	90
48) * 1,4-Dioxane	10.63	88	2044	51.871	pg	98
49) Isooctane	10.71	56	3187	37.276	pg	87
50) * Methyl Methacrylate	10.86	69	53	1.341	pg	# 1
51) * n-Heptane	11.02	71	473	6.914	pg	# 72
53) * 4-Methyl-2-pentanone	11.71	58	288	8.980	pg	89
58) * Toluene	12.73	91	10366	41.624	pg	99
59) * 2-Hexanone	13.06	58	330	12.647	pg	# 64
62) * n-Butyl Acetate	13.81	56	232	14.369	pg	# 87
63) * n-Octane	13.92	85	204	5.515	pg	89
64) * Tetrachloroethene	14.02	166	340	5.734	pg	94
65) * Chlorobenzene	14.75	112	139	1.030	pg	# 84
66) * Ethylbenzene	15.13	91	2194	10.897	pg	93
67) * m- & p-Xylenes	15.30	91	7237	47.753	pg	97
69) Cyclohexanone	15.45	98	266	15.687	pg	# 1
70) * Styrene	15.64	104	946	11.786	pg	97
71) * o-Xylene	15.74	91	1567	9.830	pg	98
72) * n-Nonane	15.98	57	452	6.779	pg	# 87

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131909.D
 Acq On : 13 Mar 2019 15:06
 Operator : RVT
 Sample : 031319 AS00312 23295
 Misc : LL ONLY // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 6 Sample Multiplier: 1

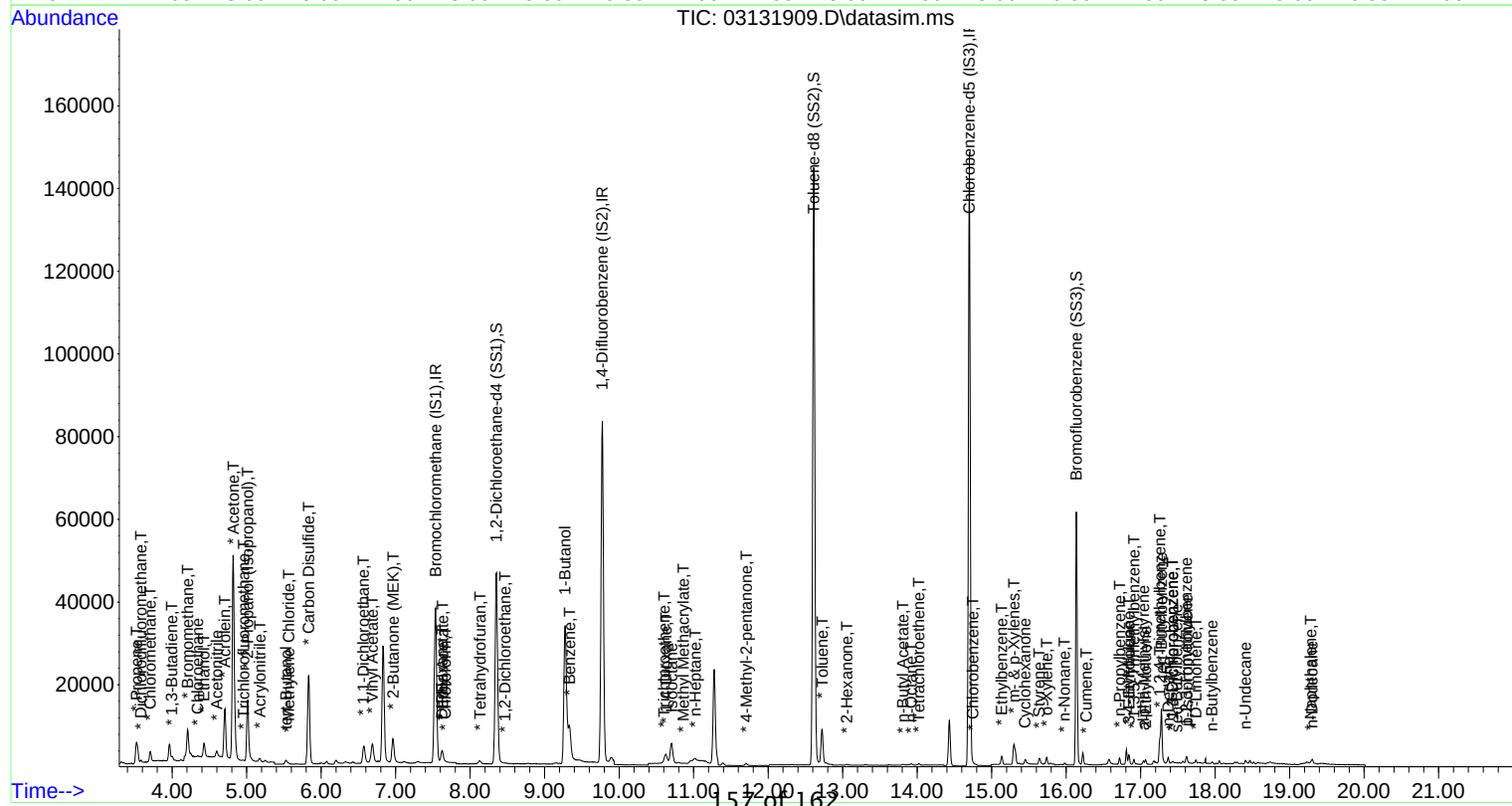
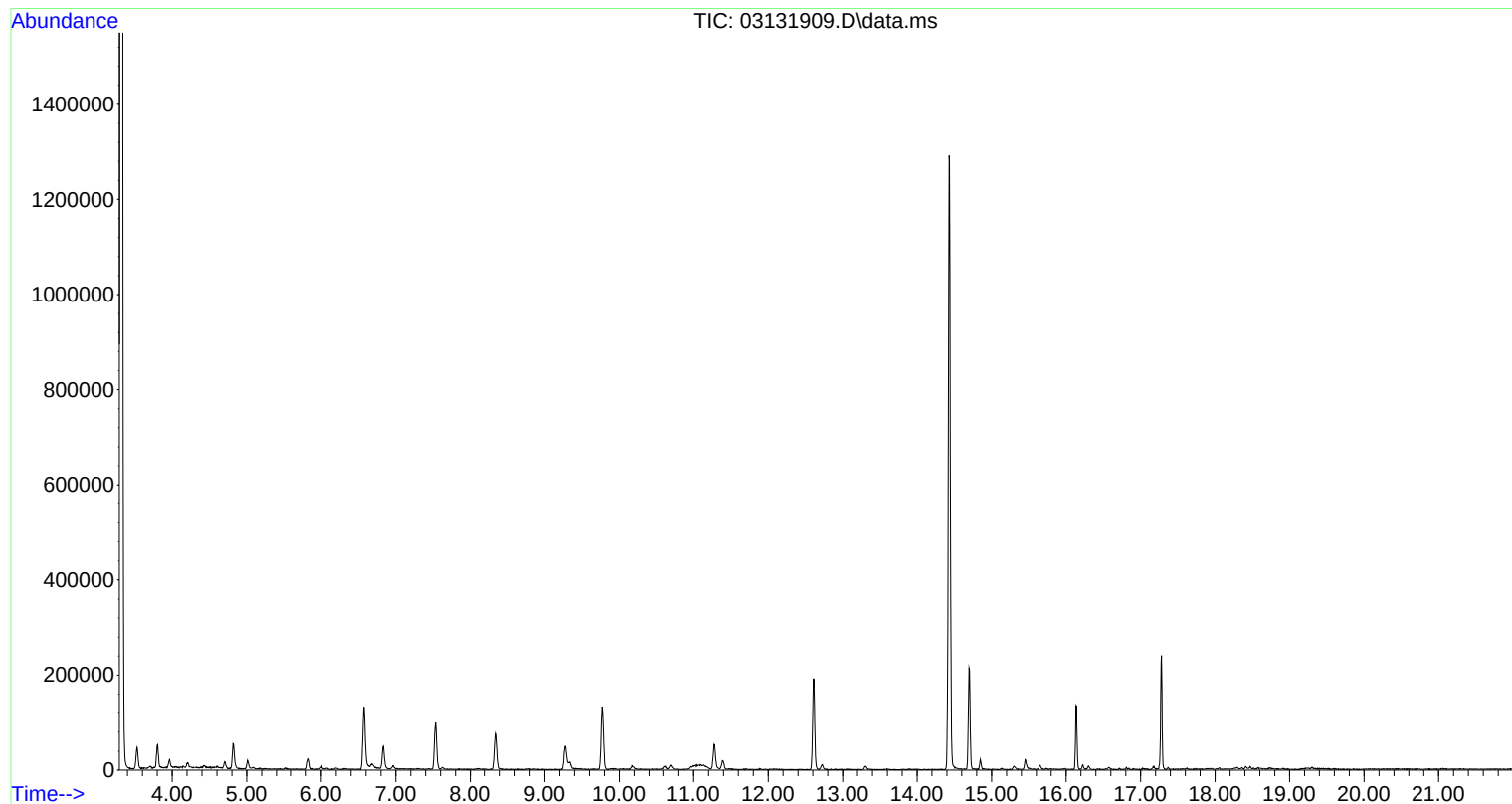
Quant Time: Mar 13 15:59:07 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
75) * Cumene	16.27	105	189	1.040	pg	94
77) * n-Propylbenzene	16.72	91	1569	8.307	pg	98
78) 3-Ethyltoluene	16.84	105	1685	11.496	pg	99
79) * 4-Ethyltoluene	16.84	105	1658	12.545	pg	96
80) * 1,3,5-Trimethylbenzene	16.91	105	787	5.958	pg	99
81) alpha-Methylstyrene	17.04	118	527	11.060	pg	# 84
82) 2-Ethyltoluene	17.07	105	935	5.949	pg	99
83) tert-Butylbenzene	17.28	134	5001	169.509	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	5683	44.951	pg	90
86) * 1,3-Dichlorobenzene	17.43	146	367	6.281	pg	97
87) * 1,4-Dichlorobenzene	17.43	146	367	7.313	pg	98
88) n-Decane	17.37	85	281	14.030	pg	92
89) sec-Butylbenzene	17.48	105	100	0.549	pg	# 59
90) 1,2,3-Trimethylbenzene	17.61	105	723	5.619	pg	96
91) p-Isopropyltoluene	17.62	134	202	5.102	pg	90
93) * D-Limonene	17.74	68	333	7.189	pg	85
94) n-Butylbenzene	17.95	134	324	14.440	pg	# 1
96) n-Undecane	18.41	85	352	30.356	pg	# 35
98) * Naphthalene	19.28	128	409	14.457	pg	# 90
99) n-Dodecane	19.30	85	160	61.897	pg	# 1

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

Data Path : I:\MS21\DATA\2019 03\13\
 Data File : 03131909.D
 Acq On : 13 Mar 2019 15:06
 Operator : RVT
 Sample : 031319 AS00312 23295
 Misc : LL ONLY // 97318 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 13 15:59:07 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\22\
 Data File : 02221924.D
 Acq On : 22 Feb 2019 11:05 pm
 Operator : RVT
 Sample : AC02111 OA02127
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 201 Sample Multiplier: 1

RVT 2/26/19

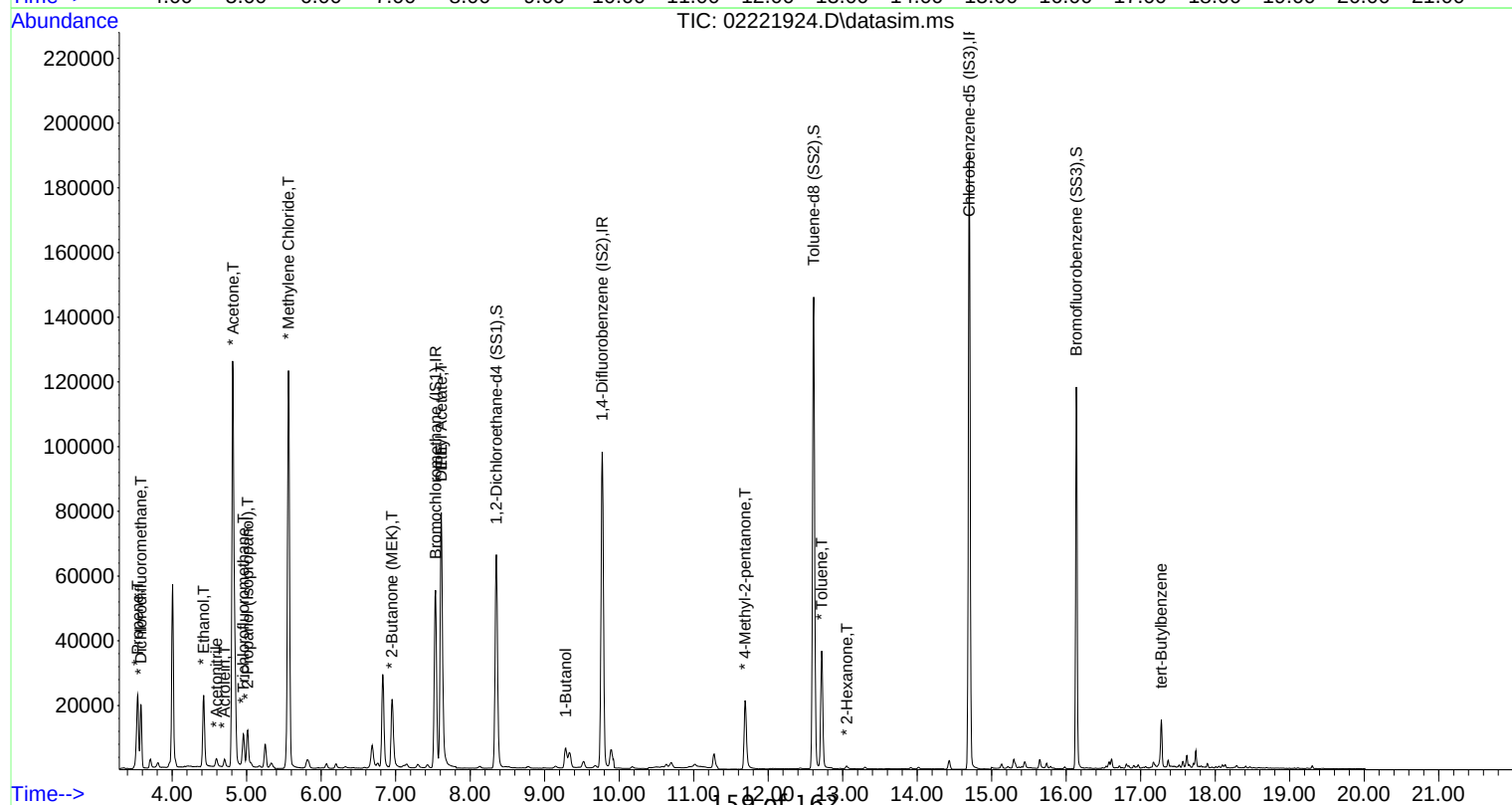
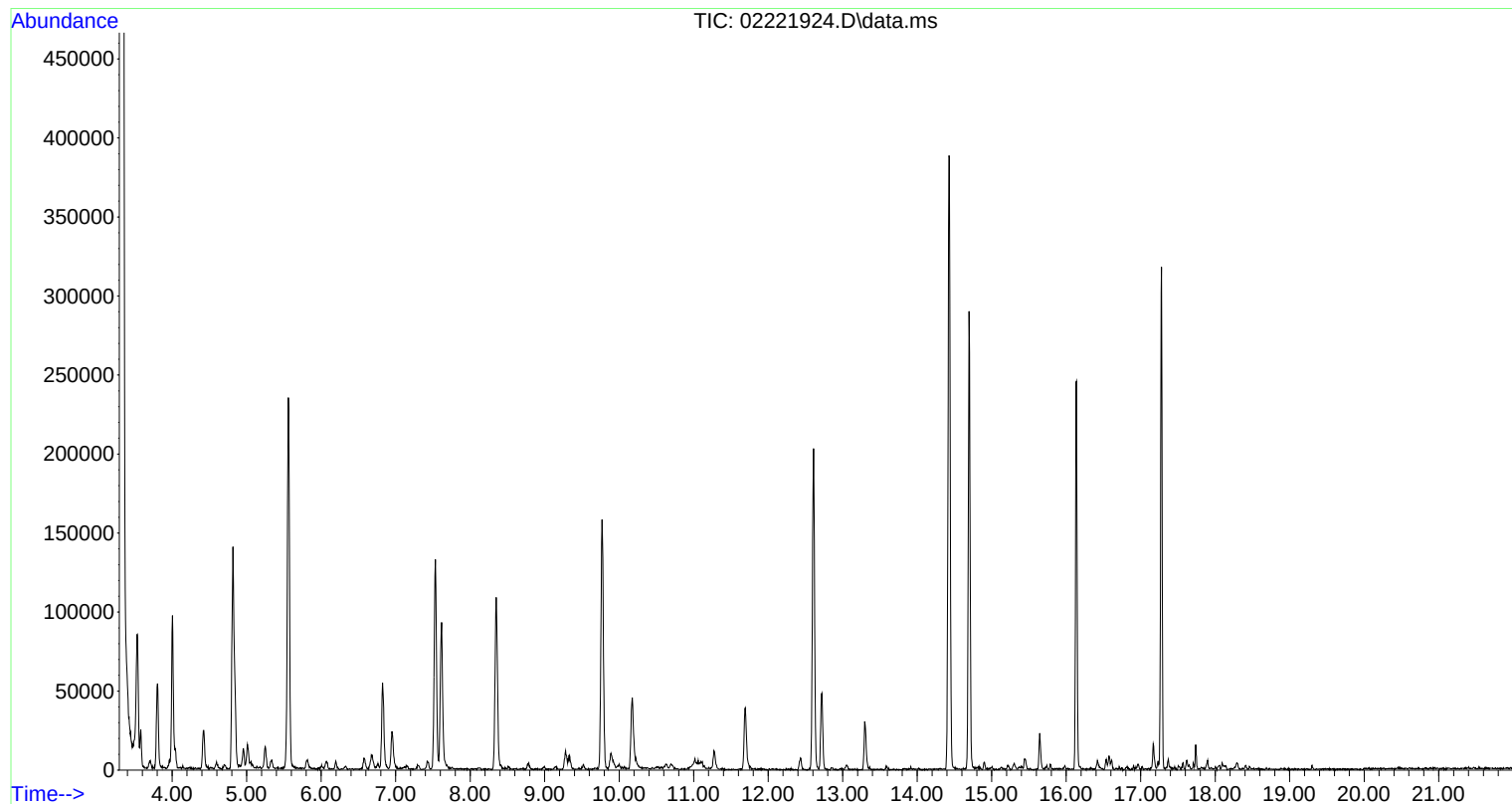
Quant Time: Feb 25 07:40:23 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	69242	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	185395	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	196955	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	101197	996.204	pg	0.00
Spiked Amount 1000.000			Recovery	=	99.62%	
57) Toluene-d8 (SS2)	12.61	98	162243	772.371	pg	0.00
Spiked Amount 1000.000			Recovery	=	77.24%	
74) Bromofluorobenzene (SS3)	16.14	174	85491	1033.205	pg	0.00
Spiked Amount 1000.000			Recovery	=	103.32%	
Target Compounds						
					Qvalue	
2) * Propene	3.54	42	7819	228.079	pg	# 1
3) * Dichlorodifluoromethane	3.58	85	21276	134.501	pg	99
10) * Ethanol	4.42	45	23940	1387.873	pg	100
11) * Acetonitrile	4.59	41	3340	78.889	pg	87
12) * Acrolein	4.70	56	2245	73.883	pg	91
13) * Acetone	4.82	58	95597	1962.847	pg	# 41
14) * Trichlorofluoromethane	4.96	101	11316	69.324	pg	100
15) * 2-Propanol (Isopropa...	5.01	45	12924	194.479	pg	90
19) * Methylene Chloride	5.56	84	143692	1893.684	pg	98
27) * 2-Butanone (MEK)	6.95	72	10329	337.024	pg	90
29) DIPE	7.61	45	16890	212.831	pg	# 37
30) * Ethyl Acetate	7.61	61	21001	1738.065	pg	86
41) 1-Butanol	9.28	56	6976	297.840	pg	# 51
53) * 4-Methyl-2-pentanone	11.69	58	13151	578.834	pg	94
58) * Toluene	12.72	91	44470	183.357	pg	99
59) * 2-Hexanone	13.06	58	1525	65.615	pg	98
83) tert-Butylbenzene	17.28	134	5790	150.419	pg	# 1

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

Data Path : I:\MS21\DATA\2019 02\22\
Data File : 02221924.D
Acq On : 22 Feb 2019 11:05 pm
Operator : RVT
Sample : AC02111 OA02127
Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
ALS Vial : 201 Sample Multiplier: 1

Quant Time: Feb 25 07:40:23 2019
Quant Method : I:\MS21\Methods\F2101182019.M
Quant Title : EPA TO-15
QLast Update : Thu Jan 31 07:44:10 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261932.D
 Acq On : 27 Feb 2019 5:31 am
 Operator : RVT
 Sample : AC02355
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 214 Sample Multiplier: 1

RVT 2/27/19

Quant Time: Feb 27 07:38:22 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	57592	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.78	114	151768	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	117048	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.36	65	84795	1003.595	pg	0.00
Spiked Amount 1000.000			Recovery	=	100.36%	
57) Toluene-d8 (SS2)	12.61	98	118066	945.775	pg	0.00
Spiked Amount 1000.000			Recovery	=	94.58%	
74) Bromofluorobenzene (SS3)	16.14	174	50790	1032.874	pg	0.00
Spiked Amount 1000.000			Recovery	=	103.29%	

Target Compounds

						Qvalue
2) * Propene	3.54	42	9899	347.162	pg	# 1
3) * Dichlorodifluoromethane	3.59	85	23522	178.779	pg	99
4) * Chloromethane	3.71	50	3157	82.010	pg	95
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	591	8.900	pg	99
7) * 1,3-Butadiene	4.01	54	219	7.276	pg	# 1
8) * Bromomethane	4.21	94	179	4.817	pg	87
10) * Ethanol	4.43	45	17178	1197.308	pg	99
11) * Acetonitrile	4.60	41	30780	874.072	pg	85
12) * Acrolein	4.71	56	691	27.341	pg	88
13) * Acetone	4.82	58	23098	570.196	pg	# 45
14) * Trichlorofluoromethane	4.96	101	13719	101.046	pg	98
15) * 2-Propanol (Isopropa...	5.02	45	14352	259.654	pg	97
16) * Acrylonitrile	5.17	53	200	4.270	pg	# 69
18) tert-Butanol	5.54	59	1397	30.487	pg	# 6
19) * Methylene Chloride	5.57	84	83216	1318.528	pg	98
20) * 3-Chloro-1-propene (...)	5.62	41	83	2.623	pg	# 20
21) * Trichlorotrifluoroet...	5.81	151	2788	35.876	pg	97
22) * Carbon Disulfide	5.84	76	3324	17.557	pg	98
26) * Vinyl Acetate	6.69	86	383	49.705	pg	67
27) * 2-Butanone (MEK)	6.96	72	2326	91.247	pg	90
29) DIPE	7.62	45	3486	52.813	pg	# 38
30) * Ethyl Acetate	7.62	61	4188	416.716	pg	94
31) * n-Hexane	7.63	57	3303	76.993	pg	95
32) * Chloroform	7.67	83	1088	9.809	pg	98
34) * Tetrahydrofuran	8.12	71	3366	184.159	pg	98
36) * 1,2-Dichloroethane	8.49	62	842	10.349	pg	97
38) * 1,1,1-Trichloroethane	8.80	97	79	1.075	pg	# 17
39) * Benzene	9.34	78	9452	55.325	pg	99
41) 1-Butanol	9.29	56	1580	82.405	pg	# 47
42) * Carbon Tetrachloride	9.53	117	3212	37.664	pg	97
43) * Cyclohexane	9.69	84	1130	25.765	pg	98
45) * 1,2-Dichloropropane	10.33	63	93	2.006	pg	# 21
46) * Bromodichloromethane	10.48	83	221	2.678	pg	# 56
47) * Trichloroethene	10.62	130	77	1.180	pg	94
48) * 1,4-Dioxane	10.64	88	115	3.598	pg	# 76
49) Isooctane	10.70	56	3495	70.511	pg	75
51) * n-Heptane	11.02	71	1438	41.355	pg	96
53) * 4-Methyl-2-pentanone	11.71	58	168	9.033	pg	100
58) * Toluene	12.72	91	46020	319.285	pg	100
59) * 2-Hexanone	13.06	58	426	30.842	pg	92
60) * Dibromochloromethane	13.16	129	52	1.012	pg	# 11
62) * n-Butyl Acetate	13.81	56	54	4.778	pg	# 30
63) * n-Octane	13.93	85	352	16.979	pg	98
64) * Tetrachloroethene	14.01	166	254	3.718	pg	97
65) * Chlorobenzene	14.74	112	66	0.602	pg	# 42

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Data Path : I:\MS21\DATA\2019 02\26\
 Data File : 02261932.D
 Acq On : 27 Feb 2019 5:31 am
 Operator : RVT
 Sample : AC02355
 Misc : 97318 (Sig #1); S31-02131901 (Sig #2)
 ALS Vial : 214 Sample Multiplier: 1

Quant Time: Feb 27 07:38:22 2019
 Quant Method : I:\MS21\Methods\F2101182019.M
 Quant Title : EPA TO-15
 QLast Update : Thu Jan 31 07:44:10 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
66) * Ethylbenzene	15.14	91	3018	27.862	pg	98
67) * m- & p-Xylenes	15.30	91	7350	87.788	pg	99
68) * Bromoform	15.34	173	64	1.677	pg #	26
69) Cyclohexanone	15.45	98	109	7.818	pg	85
70) * Styrene	15.64	104	280	5.857	pg	95
71) * o-Xylene	15.74	91	2635	30.153	pg	99
72) * n-Nonane	15.98	57	403	15.718	pg	96
75) * Cumene	16.27	105	211	1.510	pg	90
76) * alpha-Pinene	16.61	93	3793	81.837	pg	96
77) * n-Propylbenzene	16.71	91	583	4.701	pg	99
78) 3-Ethyltoluene	16.81	105	1594	15.828	pg	96
79) * 4-Ethyltoluene	16.84	105	699	7.684	pg	96
80) * 1,3,5-Trimethylbenzene	16.91	105	612	6.452	pg	94
82) 2-Ethyltoluene	17.07	105	617	5.730	pg	100
83) tert-Butylbenzene	17.27	134	708	30.950	pg #	1
84) * 1,2,4-Trimethylbenzene	17.25	105	2012	24.680	pg	86
86) * 1,3-Dichlorobenzene	17.43	146	207	3.253	pg	94
87) * 1,4-Dichlorobenzene	17.43	146	207	4.136	pg	91
88) n-Decane	17.37	85	122	10.265	pg #	71
89) sec-Butylbenzene	17.48	105	76	0.617	pg #	1
90) 1,2,3-Trimethylbenzene	17.61	105	578	6.503	pg #	50
91) p-Isopropyltoluene	17.62	134	913	34.877	pg	94
93) * D-Limonene	17.78	68	75	3.515	pg	98
94) n-Butylbenzene	18.02	134	54	3.069	pg	96
96) n-Undecane	18.41	85	74	11.763	pg #	55
98) * Naphthalene	19.29	128	99	4.423	pg #	65

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

Data Path : I:\MS21\DATA\2019 02\26\

Data File : 02261932.D

Acq On : 27 Feb 2019 5:31 am

Operator : RVT

Sample : AC02355

Misc : 97318 (Sig #1); S31-02131901 (Sig #2)

ALS Vial : 214 Sample Multiplier: 1

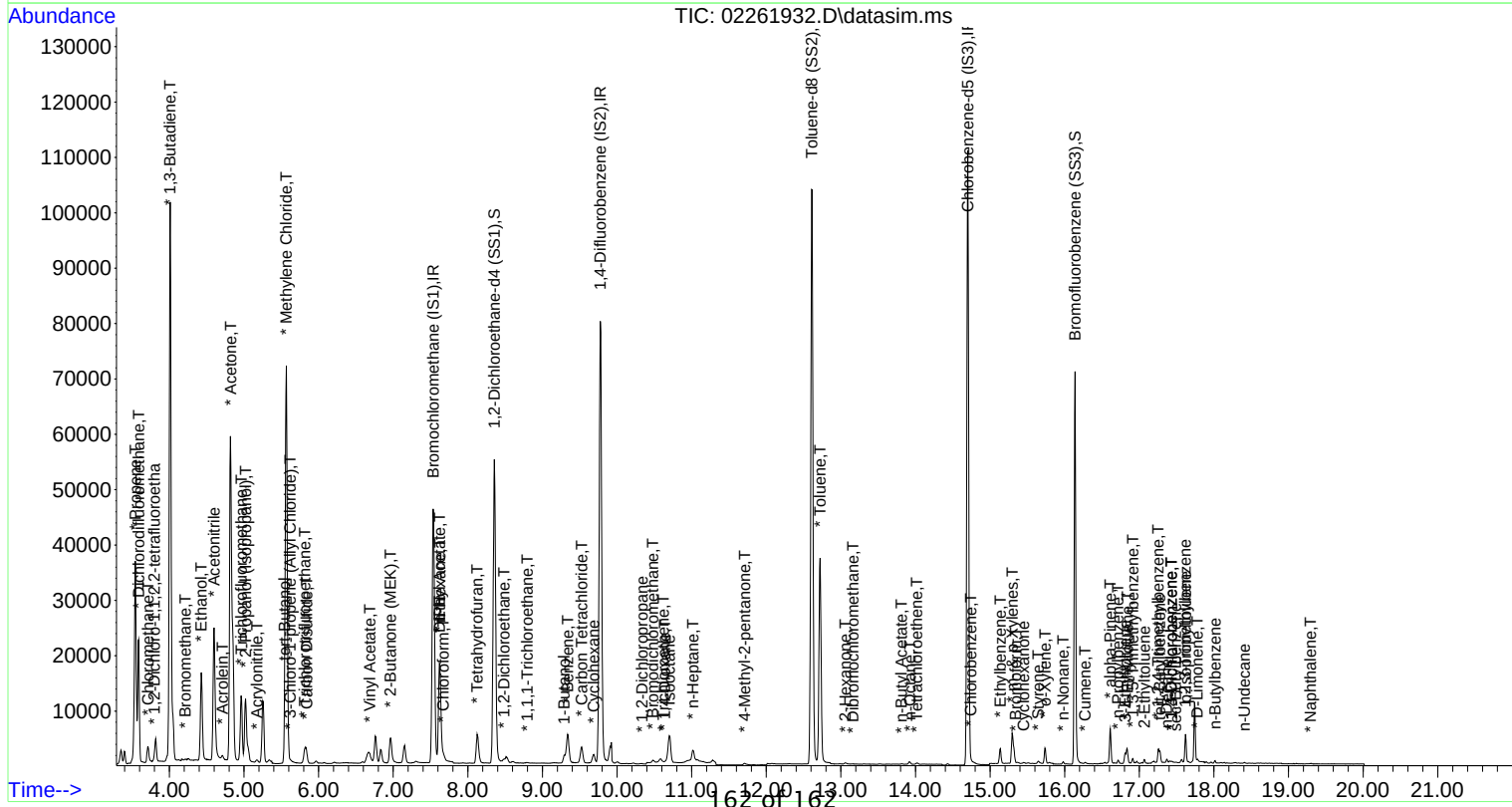
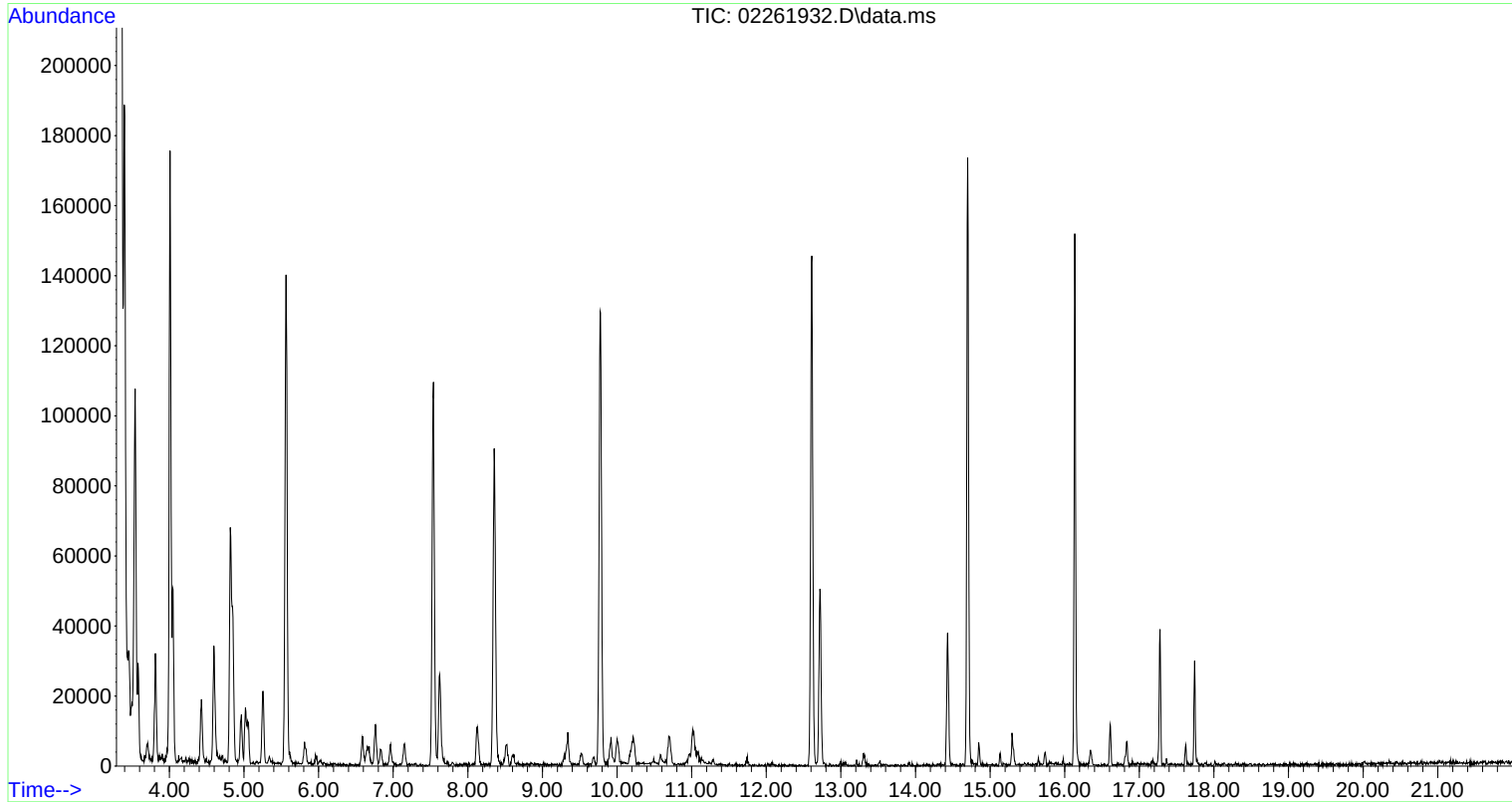
Quant Time: Feb 27 07:38:22 2019

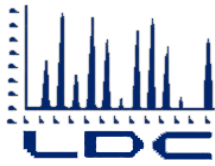
Quant Method : I:\MS21\Methods\F2101182019.M

Quant Title : EPA TO-15

QLast Update : Thu Jan 31 07:44:10 2019

Response via : Initial Calibration





LABORATORY DATA CONSULTANTS, INC.

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WSP Group
5 Sullivan Street
Cazenovia, NY 13035
ATTN: Mr. Erik S. Reinert
erik.reinert@wspgroup.com

April 12, 2019

SUBJECT: Former Huck Manufacturing Site, Kingston, NY, Data Validation

Dear Mr. Reinert,

Enclosed is the final validation report for the fraction listed below. This SDG was received on March 28, 2019. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #44638:

<u>SDG</u>	<u>Fraction</u>
P1901513	Volatiles

The data validation was performed under Category B guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Region 2 Analysis of Volatile Organic Compounds in Air Contained Canisters, SOP HW-31, Revision 6; June 2014
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review; EPA 540-R-2017-002; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
crink@lab-data.com
Project Manager/Senior Chemist

Site: Former Huck Manufacturing Site, Kingston, NY
Laboratory: ALS Environmental
Report No.: P1901513
Reviewer: Josephine Go and Christina Rink/Laboratory Data Consultants for WSP Group - Pittsburg, PA
Date: April 11, 2019

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
HUCKIAF031919-1	P1901513-001	VOC
HUCKIAF031919-2	P1901513-002	VOC
HUCKIAFR031919-2	P1901513-003	VOC
HUCKIAF031919-3	P1901513-004	VOC
HUCKIAF031919-4	P1901513-005	VOC
HUCKIAF031919-5	P1901513-006	VOC
HUCKIAF031919-6	P1901513-007	VOC
HUCKAA031919-1	P1901513-008	VOC
HUCKAA031919-2	P1901513-009	VOC
TripBlank031919	P1901513-010	VOC

Associated QC Samples(s):

Field/Trip Blanks: TripBlank031919

Field Duplicate pair: HUCKIAF031919-2 and HUCKIAFR031919-2

The above-listed air samples were collected on March 19, 2019 and were analyzed for volatile organic compounds (VOCs) by method TO-15. The data validation was performed in accordance with the USEPA Region 2 *Analysis of Volatile Organic Compounds in Air Contained Canisters*, SOP HW-31, Revision 6 (September 2016) and the USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- Initial and Continuing Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Duplicate Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All criteria were met.

GC/MS Tunes

All criteria were met.

Initial and Continuing Calibrations

All criteria were met.

Blanks

Contamination was not detected in the method blanks.

No positive results were found in the trip blank sample TripBlank031919 for VOC analysis.

Surrogate Recoveries

All criteria were met.

MS/MSD Results

MS/MSD analyses were not required by the method. Validation action was not required on this basis.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples HUCKIAF031919-2 and HUCKIAFR031919-2 were submitted as the field duplicate pair with this sample group. The following table summarizes the concentrations and validation actions taken.

Compound	Concentration (ug/m ³)		RPD
	HUCKIAF031919-2	HUCKIAFR031919-2	
cis-1,2-Dichloroethene	0.13	0.12	8
Trichloroethene	4.8	4.8	0
Tetrachloroethene	0.79	0.79	0

Quantitation Limits and Data Assessment

No results were reported below the reporting limit (RL) and above the minimum detection limit (MDL) in the analysis.

Dilutions were not required for analysis.

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- JN - The analysis indicates the presence of a compound that has been “tentatively identified” (N) and the associated numerical value represents its approximate (J) concentration.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 44638A48

VALIDATION COMPLETENESS WORKSHEET

SDG #: P1901513

Category B

Laboratory: ALS Environmental

Date: 04/09/19

Page: 1 of 1

Reviewer: *SM*2nd Reviewer: *SM***METHOD:** GC/MS Volatiles (EPA Method TO-15)

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A / X	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A / A	1 CAL = 30 L 1 CAL = 30 L
IV.	Continuing calibration	A	CAV = 30 L
V.	Laboratory Blanks	A	(canisters - per sample)
VI.	Field blanks	ND	TB = 1
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	LCS
X.	Field duplicates	SW	D = 2/3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

SB = Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	HUCKIAF031919-1	P1901513-001	Air	03/19/19
2	HUCKIAF031919-2	P1901513-002	Air	03/19/19
3	HUCKIAFR031919-2	P1901513-003	Air	03/19/19
4	HUCKIAF031919-3	P1901513-004	Air	03/19/19
5	HUCKIAF031919-4	P1901513-005	Air	03/19/19
6	HUCKIAF031919-5	P1901513-006	Air	03/19/19
7	HUCKIAF031919-6	P1901513-007	Air	03/19/19
8	HUCKAA031919-1	P1901513-008	Air	03/19/19
9	HUCKAA031919-2	P1901513-009	Air	03/19/19
10	TripBlank031919	P1901513-010	Air	03/19/19
11				
12	P190322-MB			
13				

(OQR, S, AA only)

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	☒	☐	☐	
Was canister pressure criteria met?	☒	☐	☐	
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	☒	☐	☐	
Were all samples analyzed within the 24 hour clock criteria?	☒	☐	☐	
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	☒	☐	☐	
Were all percent relative standard deviations (%RSD) $\leq$ 30%?	☒	☐	☐	
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	☒	☐	☐	
Were all percent differences (%D) $\leq$ 30%?	☒	☐	☐	
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	☒	☐	☐	
Were all percent differences (%D) $\leq$ 30%?	☒	☐	☐	
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	☒	☐	☐	
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	☒	☐	☐	
Was there contamination in the laboratory blanks?	☐	☒	☐	
Was a canister blank analyzed for every canister?	☒	☐	☐	
Was there contamination in the canister blanks?	☐	☒	☐	
VI. Field Blanks				
Were field blanks identified in this SDG?	☒	☐	☐	
Were target compounds detected in the field blanks?	☐	☒	☐	
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?	☒	☐	☐	
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?	☐	☐	☒	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?	☐	☒	☐	
Were the relative percent differences (RPD) within the QC limits?	☐	☐	☒	

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed per analytical batch for this SDG?	☒	☐	☐	
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	☒	☐	☐	
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	☒	☐	☐	
Were target compounds detected in the field duplicates?	☒	☐	☐	
XI. Internal standards				
Were internal standard area counts within $\pm 40\%$ from the associated calibration standard?	☒	☐	☐	
Were retention times within ± 20.0 seconds from the associated calibration standard?	☒	☐	☐	
XII. Compound quantitation				
Did the laboratory LOQs/RLs meet the QAPP LOQs/RLs?	☒	☐	☐	
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	☒	☐	☐	
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	☒	☐	☐	
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	☒	☐	☐	
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	☒	☐	☐	
Were chromatogram peaks verified and accounted for?	☒	☐	☐	
XIV. System performance				
System performance was found to be acceptable.	☒	☐	☐	
XV. Leak check compounds				
Was a leak check compound used to evaluate sample integrity and included in the laboratory analyte list?	☒	☐	☐	
Was the leak check compound detected in the samples? If yes, please see leak check validation findings worksheet.	☒	☐	☐	
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	☒	☐	☐	

TARGET COMPOUND WORKSHEET

METHOD: VOA

A. Chloromethane	AA. Tetrachloroethene	AAA. 1,3,5-Trimethylbenzene	AAAA. Ethyl tert-butyl ether	A1. 1,3-Butadiene	A2.
B. Bromomethane	BB. 1,1,2,2-Tetrachloroethane	BBB. 4-Chlorotoluene	BBBB. tert-Amyl methyl ether	B1. Hexane	B2.
C. Vinyl chloride	CC. Toluene	CCC. tert-Butylbenzene	CCCC. 1-Chlorohexane	C1. Heptane	C2.
D. Chloroethane	DD. Chlorobenzene	DDD. 1,2,4-Trimethylbenzene	DDDD. Isopropyl alcohol	D1. Propylene	D2.
E. Methylene chloride	EE. Ethylbenzene	EEE. sec-Butylbenzene	EEEE. Acetonitrile	E1. Freon 11	E2.
F. Acetone	FF. Styrene	FFF. 1,3-Dichlorobenzene	FFFF. Acrolein	F1. Freon 12	F2.
G. Carbon disulfide	GG. Xylenes, total	GGG. p-Isopropyltoluene	GGGG. Acrylonitrile	G1. Freon 113	G2.
H. 1,1-Dichloroethene	HH. Vinyl acetate	HHH. 1,4-Dichlorobenzene	HHHH. 1,4-Dioxane	H1. Freon 114	H2.
I. 1,1-Dichloroethane	II. 2-Chloroethylvinyl ether	III. n-Butylbenzene	IIII. Isobutyl alcohol	I1. 2-Nitropropane	I2.
J. 1,2-Dichloroethene, total	JJ. Dichlorodifluoromethane	JJJ. 1,2-Dichlorobenzene	JJJJ. Methacrylonitrile	J1. Dimethyl disulfide	J2.
K. Chloroform	KK. Trichlorofluoromethane	KKK. 1,2,4-Trichlorobenzene	KKKK. Propionitrile	K1. 2,3-Dimethyl pentane	K2.
L. 1,2-Dichloroethane	LL. Methyl-tert-butyl ether	LLL. Hexachlorobutadiene	LLLL. Ethyl ether	L1. 2,4-Dimethyl pentane	L2.
M. 2-Butanone	MM. 1,2-Dibromo-3-chloropropane	MMM. Naphthalene	MMMM. Benzyl chloride	M1. 3,3-Dimethyl pentane	M2.
N. 1,1,1-Trichloroethane	NN. Methyl ethyl ketone	NNN. 1,2,3-Trichlorobenzene	NNNN. Iodomethane	N1. 2-Methylpentane	N2.
O. Carbon tetrachloride	OO. 2,2-Dichloropropane	OOO. 1,3,5-Trichlorobenzene	OOOO. 1,1-Difluoroethane	O1. 3-Methylpentane	O2.
P. Bromodichloromethane	PP. Bromochloromethane	PPP. trans-1,2-Dichloroethene	PPPP. Tetrahydrofuran	P1. 3-Ethylpentane	P2.
Q. 1,2-Dichloropropane	QQ. 1,1-Dichloropropene	QQQ. cis-1,2-Dichloroethene	QQQQ. Methyl acetate	Q1. 2,2-Dimethylpentane	Q2.
R. cis-1,3-Dichloropropene	RR. Dibromomethane	RRR. m,p-Xylenes	RRRR. Ethyl acetate	R1. 2,2,3-Trimethylbutane	R2.
S. Trichloroethene	SS. 1,3-Dichloropropane	SSS. o-Xylene	SSSS. Cyclohexane	S1. 2,2,4-Trimethylpentane	S2.
T. Dibromochloromethane	TT. 1,2-Dibromoethane	TTT. 1,1,2-Trichloro-1,2,2-trifluoroethane	TTTT. Methylcyclohexane	T1. 2-Methylhexane	T2.
U. 1,1,2-Trichloroethane	UU. 1,1,1,2-Tetrachloroethane	UUU. 1,2-Dichlorotetrafluoroethane	UUUU. Allyl chloride	U1. Nonanal	U2.
V. Benzene	VV. Isopropylbenzene	VVV. 4-Ethyltoluene	VVVV. Methyl methacrylate	V1. 2-Methylnaphthalene	V2.
W. trans-1,3-Dichloropropene	WW. Bromobenzene	WWW. Ethanol	WWWW. Ethyl methacrylate	W1. Methanol	W2.
X. Bromoform	XX. 1,2,3-Trichloropropane	XXX. Di-isopropyl ether	XXXX. cis-1,4-Dichloro-2-butene	X1. 1,2,3-Trimethylbenzene	X2.
Y. 4-Methyl-2-pentanone	YY. n-Propylbenzene	YYY. tert-Butanol	YYYY. trans-1,4-Dichloro-2-butene	Y1.	Y2.
Z. 2-Hexanone	ZZ. 2-Chlorotoluene	ZZZ. tert-Butyl alcohol	ZZZZ. Pentachloroethane	Z1.	Z2.

VALIDATION FINDINGS WORKSHEET
Field Duplicates**METHOD:** GC/MS VOA (EPA Method TO15)Y N N/A
Y N N/A

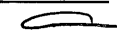
Were field duplicate pairs identified in this SDG?

Were target compounds identified in the field duplicate pairs?

Compound	Concentration (ug/m3)		RPD
	2	3	
QQQ	0.13	0.12	8
S	4.8	4.8	0
AA	0.79	0.79	0

LDC #: 44638A48

VALIDATION FINDINGS WORKSHEET
Initial Calibration Calculation Verification

Page: 1 of 1
Reviewer: JVG
2nd Reviewer: 

METHOD: GC/MS VOA (EPA Method TO-15)

The Relative Response Factor (RRF), average RRF, and percent relative standard deviation (%RSD) were recalculated for the compounds identified below using the following calculations:

$$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$$

average RRF = sum of the RRFs/number of standards

$$\%RSD = 100 * (S/X)$$

 A_x = Area of Compound C_x = Concentration of compound, S = Standard deviation of the RRFs, A_{is} = Area of associated internal standard C_{is} = Concentration of internal standard X = Mean of the RRFs

#	Standard ID	Calibration Date	Compound (IS)	Reported RRF (1.0 ng)	Recalculated RRF (1.0 ng)	Reported Average RRF (Initial)	Recalculated Average RRF (Initial)	Reported %RSD	Recalculated %RSD
1	ICAL MS16	3/22/2019	cis-1,2-DCE (BCM)	1.469	1.469	1.496	1.496	5.25	5.26
			Trichloroethene (DFB)	0.338	0.338	0.349	0.349	12.49	12.49
			Tetrachloroethene (CBZ)	0.935	0.935	0.942	0.942	10.67	10.65

VALIDATION FINDINGS WORKSHEET
Continuing Calibration Results Verification

METHOD: GC/MS VOA (EPA Method TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$
$$\text{RRF} = (\text{Ax})(\text{Cis}) / (\text{Ais})(\text{Cx})$$

Where:

ave. RRF = initial calibration average RRF

RRF = continuing calibration RRF

Ax = Area of compound,

Cx = Concentration of compound,

Ais = Area of associated internal standard

Cis = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (IS)	Average RRF (Initial)	Reported RRF (CC)	Recalculated RRF (CC)	Reported % D	Recalculated %D
1	03221912	03/22/19	cis-1,2-DCE (BCM)	1.496	1.468	1.468	1.9	1.9
			Trichloroethene (DFB)	0.349	0.334	0.334	4.3	4.3
			Tetrachloroethene (CBZ)	0.942	0.909	0.909	3.5	3.5

LDC #: 44638A48

VALIDATION FINDINGS WORKSHEET

Sample Calculation Verification

Page: 1 of 1

Reviewer: JVG

2nd reviewer: _____

METHOD: GC/MS VOA (EPA Method TO-15)

Y N N/A

Were all reported results recalculated and verified for all level IV samples?

Y	N	N/A

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_y)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

Example:

Sample I.D. 1, 5:

$$\text{Conc.} = \frac{(83728)(12.50)(1.47)}{(85264)(0.349)} \quad () ()$$
$$= 5.17 \mu\text{g}/\text{m}^3$$
$$p_{pbv} = \frac{(5.17)(24.46)}{(131.39)} = 0.962 \text{ fpbv}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

[illegible]

Former Huck Manufacturing Site, Kingston, NY - LDC# 44638

SDG: P1901513

Analytical Method		TO15										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Validated	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
HUCKAA031919-1	P1901513-00	Cis-1,2-Dichloroethylene	3/23/2019		Y	N	U		U	0.10	0.10	ug/m3
HUCKAA031919-1	P1901513-00	Trichloroethylene (TCE)	3/23/2019		Y	N	U		U	0.099	0.099	ug/m3
HUCKAA031919-1	P1901513-00	Tetrachloroethene	3/23/2019	0.11	Y	Y	J		J	0.095	0.095	ug/m3
HUCKAA031919-2	P1901513-00	Trichloroethylene (TCE)	3/23/2019		Y	N	U		U	0.10	0.10	ug/m3
HUCKAA031919-2	P1901513-00	Tetrachloroethene	3/23/2019	0.11	Y	Y	J		J	0.097	0.097	ug/m3
HUCKAA031919-2	P1901513-00	Cis-1,2-Dichloroethylene	3/23/2019		Y	N	U		U	0.11	0.11	ug/m3
HUCKIAF031919-1	P1901513-00	Tetrachloroethene	3/22/2019	0.77	Y	Y				0.10	0.10	ug/m3
HUCKIAF031919-1	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019	0.14	Y	Y	J		J	0.11	0.11	ug/m3
HUCKIAF031919-1	P1901513-00	Trichloroethylene (TCE)	3/22/2019	5.2	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-2	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019	0.13	Y	Y	J		J	0.12	0.12	ug/m3
HUCKIAF031919-2	P1901513-00	Tetrachloroethene	3/22/2019	0.79	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-2	P1901513-00	Trichloroethylene (TCE)	3/22/2019	4.8	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-3	P1901513-00	Tetrachloroethene	3/22/2019	0.92	Y	Y				0.097	0.097	ug/m3
HUCKIAF031919-3	P1901513-00	Trichloroethylene (TCE)	3/22/2019	4.3	Y	Y				0.10	0.10	ug/m3
HUCKIAF031919-3	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019	0.14	Y	Y	J		J	0.11	0.11	ug/m3
HUCKIAF031919-4	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019		Y	N	U		U	0.11	0.11	ug/m3
HUCKIAF031919-4	P1901513-00	Tetrachloroethene	3/22/2019	0.81	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-4	P1901513-00	Trichloroethylene (TCE)	3/22/2019	0.81	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-5	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019	0.16	Y	Y				0.11	0.11	ug/m3
HUCKIAF031919-5	P1901513-00	Trichloroethylene (TCE)	3/22/2019	4.5	Y	Y				0.10	0.10	ug/m3
HUCKIAF031919-5	P1901513-00	Tetrachloroethene	3/22/2019	1.2	Y	Y				0.098	0.098	ug/m3
HUCKIAF031919-6	P1901513-00	Tetrachloroethene	3/22/2019	0.59	Y	Y				0.099	0.099	ug/m3
HUCKIAF031919-6	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019		Y	N	U		U	0.11	0.11	ug/m3

SDG: P1901513

Analytical Method		TO15										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Validated	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
HUCKIAF031919-6	P1901513-00	Trichloroethylene (TCE)	3/22/2019	2.2	Y	Y				0.10	0.10	ug/m3
HUCKIAFR031919-2	P1901513-00	Tetrachloroethene	3/22/2019	0.79	Y	Y				0.11	0.11	ug/m3
HUCKIAFR031919-2	P1901513-00	Trichloroethylene (TCE)	3/22/2019	4.8	Y	Y				0.11	0.11	ug/m3
HUCKIAFR031919-2	P1901513-00	Cis-1,2-Dichloroethylene	3/22/2019	0.12	Y	Y	J		J	0.12	0.12	ug/m3
TRIPBLANK031919	P1901513-01	Trichloroethylene (TCE)	3/23/2019		Y	N	U		U	0.072	0.072	ug/m3
TRIPBLANK031919	P1901513-01	Cis-1,2-Dichloroethylene	3/23/2019		Y	N	U		U	0.075	0.075	ug/m3
TRIPBLANK031919	P1901513-01	Tetrachloroethene	3/23/2019		Y	N	U		U	0.069	0.069	ug/m3



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www.alsglobal.com

LABORATORY REPORT

April 18, 2019

Brian Silber
WSP Group
7000 East Genesee St., Building D, 2nd Floor
Fayetteville, NY 13066

RE: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Dear Brian:

Enclosed are the results of the sample submitted to our laboratory on April 4, 2019. For your reference, these analyses have been assigned our service request number P1901824.

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



By Sue Anderson at 10:08 am, Apr 18, 2019

Sue Anderson
Project Manager



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

Client: WSP Group
Project: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Service Request No: P1901824
New York Lab ID: 11221

CASE NARRATIVE

The samples were received intact under chain of custody on April 4, 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 in SIM mode 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 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.



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 Simi Valley, CA 93065
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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	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
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: WSP Group
 Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Service Request: P1901824

Date Received: 4/4/2019
 Time Received: 09:30

TO-15 - VOC SIM

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
HUCK IA F040219-1	P1901824-001	Air	4/2/2019	16:29	AC02421	-2.55	3.80	X
HUCK IA F040219-2	P1901824-002	Air	4/2/2019	16:34	AC02455	-2.46	3.86	X
HUCK IA FR040219-2	P1901824-003	Air	4/2/2019	16:34	AC01830	-2.92	3.83	X
HUCK IA F040219-3	P1901824-004	Air	4/2/2019	16:20	AC02456	-2.49	3.90	X
HUCK IA F040219-4	P1901824-005	Air	4/2/2019	17:02	AC02460	-1.79	3.79	X
HUCK IA F040219-5	P1901824-006	Air	4/2/2019	16:46	SC00904	-2.74	3.70	X
HUCK IA F040219-6	P1901824-007	Air	4/2/2019	16:57	AC02458	-1.73	3.73	X
HUCK AA F040219-1	P1901824-008	Air	4/2/2019	17:08	AC02416	-2.16	3.91	X
HUCK AA F040219-2	P1901824-009	Air	4/2/2019	17:06	AC01305	-2.68	3.65	X
TRIPBLANK 040219-1	P1901824-010	Air	4/2/2019	00:00	AC02322	-14.30	3.77	X

ALS Environmental **Sample Acceptance Check Form**

Client: WSP Group Work order: P1901824
 Project: Federal Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00
 Sample(s) received on: 4/4/19 Date opened: 4/4/19 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)? <u>Box sealing.</u> 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 <u>if necessary</u> 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
P1901824-001.01	6.0 L Ambient Can					
P1901824-002.01	6.0 L Ambient Can					
P1901824-003.01	6.0 L Ambient Can					
P1901824-004.01	6.0 L Ambient Can					
P1901824-005.01	6.0 L Ambient Can					
P1901824-006.01	6.0 L Source Can					
P1901824-007.01	6.0 L Ambient Can					
P1901824-008.01	6.0 L Ambient Can					
P1901824-009.01	6.0 L Ambient Can					
P1901824-010.01	6.0 L Ambient Can					
P1901824-011.01	6.0 L Ambient Can					
P1901824-012.01	6.0 L Ambient Can					

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

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SAMPLE IDENTIFICATION AND ANALYTICAL REQUIREMENT SUMMARY

[illegible]

SAMPLE PREPARATION AND ANALYSIS SUMMARY

VOLATILE (VOA) ANALYSES

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Page 1 of 1

Company Name & Address (Reporting Information) WSP 3500 5th Ave Buffalo, NY 14203		Phone 315-655-3400		Fax 315-655-3400		Project Manager Brian Silfer		ALS Project No. 1824	
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 Contact Brian Silfer		Analysis Method EPA 821-R	
Project Name Federal Roadway Interchange						Project Number 340425		Comments e.g. Actual Preservative or specific instructions	
P.O. # / Billing Information 13530 Davis Technology Drive Herndon, VA 22061						Sampler (Print & Sign) Brian Silfer			
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 ⁿ Hg	Canister End Pressure ⁿ Hg/psig	Sample Volume	
WSP-AC-040219-1	1	04/22/19	08:20	AC-02421	CA-00385	-31.41	-6.5	6.4	
WSP-AC-040219-2	2	04/22/19	08:21	AC-02455	CA-00631	-31.33	-6		
WSP-AC-040219-3	3	04/22/19	08:31	AC-02185	CA-00220	-31.30	-6.5		
WSP-AC-040219-4	4	04/22/19	08:37	AC-02451	CA-00816	-31.06	-4.5		
WSP-AC-040219-5	5	04/22/19	08:54	AC-02460	CA-01304	-31.29	-4		
WSP-AC-040219-6	6	04/22/19	09:02	AC-02094	CA-01140	-31.27	-7		
WSP-AC-040219-7	7	04/22/19	09:07	AC-02455	CA-01041	-31.21	-6		
WSP-AC-040219-8	8	04/22/19	09:17	AC-02416	CA-01433	-31.22	-6.5		
WSP-AC-040219-9	9	04/22/19	09:31	AC-02185	CA-01261	-31.25	-7		
WSP-AC-040219-10	10	04/22/19	09:47	AC-02232					
Report Tier Levels - please select Tier I - Results (Default if not specified) _____ Tier II (Results + QC Summaries) ☒ Tier III (Results + QC & Calibration Summaries) _____ Tier IV (Data Validation Package) 10% Surcharge _____									
Relinquished by: (Signature) _____		Date: 04/23/19		Time: 2:10		EDD required: Yes / No Type: 2005		Chain of Custody Seal (Circle) NTACT BROKEN	
Relinquished by: (Signature) _____		Date: 4/24/19		Time: 8:30		Project Requirements (MRLs, QAPP) _____		Cooler / Blank Temperature _____ °C	

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Page 1 of 1

Client: WSP Group
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824

Test Code: EPA TO-15 SIM
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister(s)
Test Notes:

Date(s) Collected: 4/2/19

Date(s) Received: 4/4/19

Date(s) Analyzed: 4/5/19

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4	Toluene-d8	Bromofluorobenzene	Acceptance Limits	Data Qualifier
		% Recovered	% Recovered	% Recovered		
Method Blank	P190405-MB	98	103	103	70-130	
Lab Control Sample	P190405-LCS	98	100	109	70-130	
HUCK IA F040219-1	P1901824-001	94	104	107	70-130	
HUCK IA F040219-2	P1901824-002	92	104	109	70-130	
HUCK IA FR040219-2	P1901824-003	91	103	111	70-130	
HUCK IA F040219-3	P1901824-004	88	103	110	70-130	
HUCK IA F040219-4	P1901824-005	89	102	104	70-130	
HUCK IA F040219-5	P1901824-006	90	103	112	70-130	
HUCK IA F040219-6	P1901824-007	92	103	111	70-130	
HUCK AA F040219-1	P1901824-008	89	103	111	70-130	
HUCK AA F040219-2	P1901824-009	91	103	113	70-130	
TRIPBLANK 040219-1	P1901824-010	94	103	102	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

Page 1 of 1

Client: WSP Group
Client Sample ID: Lab Control Sample
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
ALS Sample ID: P190405-LCS

Test Code: EPA TO-15 SIM
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/5/19
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	8.43	7.90	94	79-116	
79-01-6	Trichloroethene	8.54	7.99	94	79-116	
127-18-4	Tetrachloroethene	8.51	7.84	92	77-117	

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

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.00
ALS Project ID: P1901824

Method Blank Summary

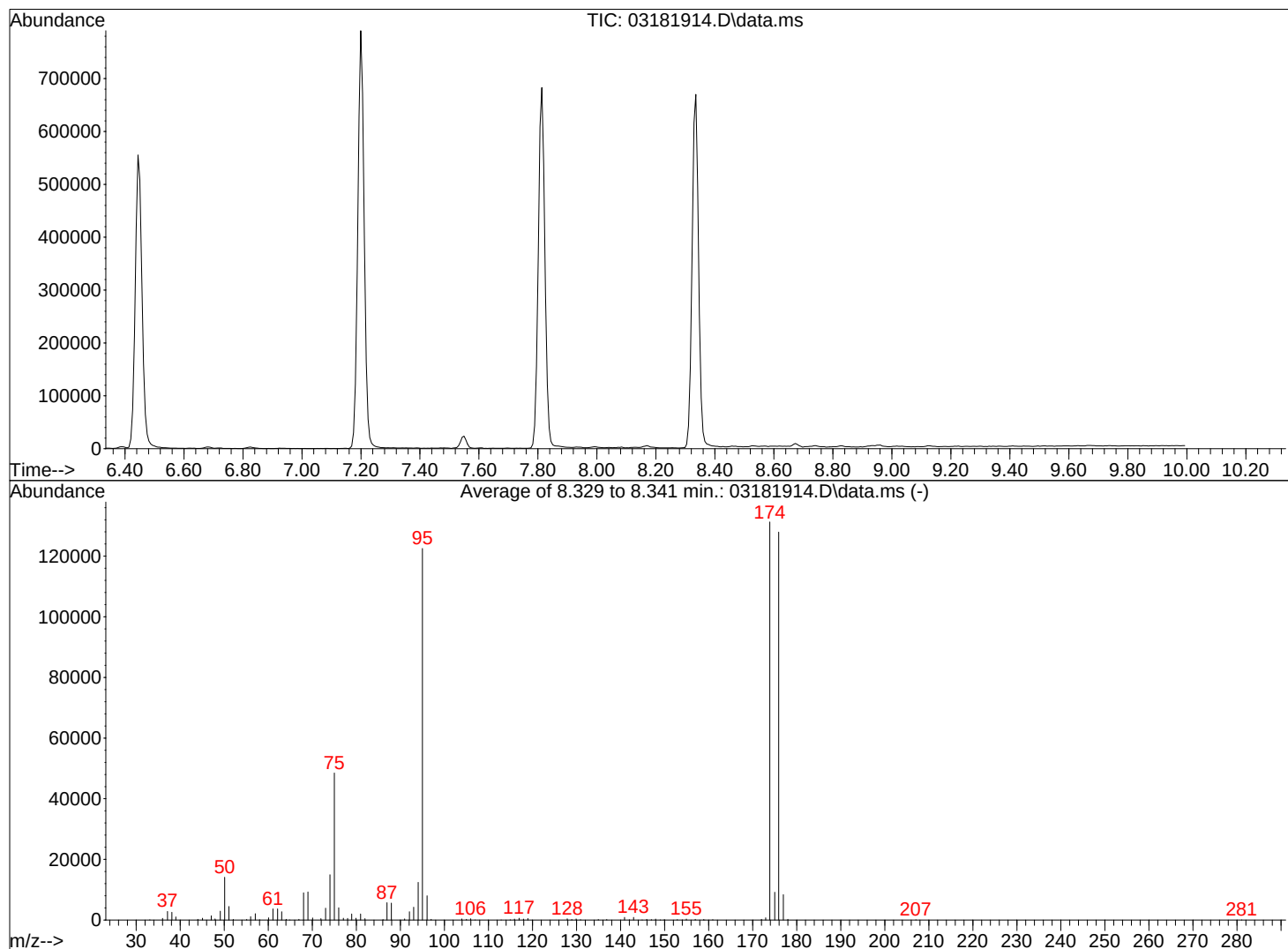
Test Code: EPA TO-15 SIM
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister(s)
Test Notes:
Lab File ID: 04051904.D
Date Analyzed: 4/5/19
Time Analyzed: 05:56

Client Sample ID	ALS Sample ID	Lab File ID	Time Analyzed
Lab Control Sample	P190405-LCS	04051905.D	06:28
TRIPBLANK 040219-1	P1901824-010	04051908.D	10:32
HUCK IA F040219-1	P1901824-001	04051909.D	11:03
HUCK IA F040219-2	P1901824-002	04051910.D	11:35
HUCK IA FR040219-2	P1901824-003	04051911.D	12:06
HUCK IA F040219-3	P1901824-004	04051912.D	12:37
HUCK IA F040219-4	P1901824-005	04051913.D	13:09
HUCK IA F040219-5	P1901824-006	04051914.D	13:40
HUCK IA F040219-6	P1901824-007	04051915.D	14:12
HUCK AA F040219-1	P1901824-008	04051916.D	14:44
HUCK AA F040219-2	P1901824-009	04051917.D	15:15

Data Path : I:\MS19\DATA\2019 03\18\
 Data File : 03181914.D
 Acq On : 18 Mar 2019 16:00
 Operator : TD
 Sample : BFB S19031819
 Misc : S31-03161901
 ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : I:\MS19\METHODS\S19031819.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Mar 19 08:07:16 2019



AutoFind: Scans 691, 692, 693; Background Corrected with Scan 684

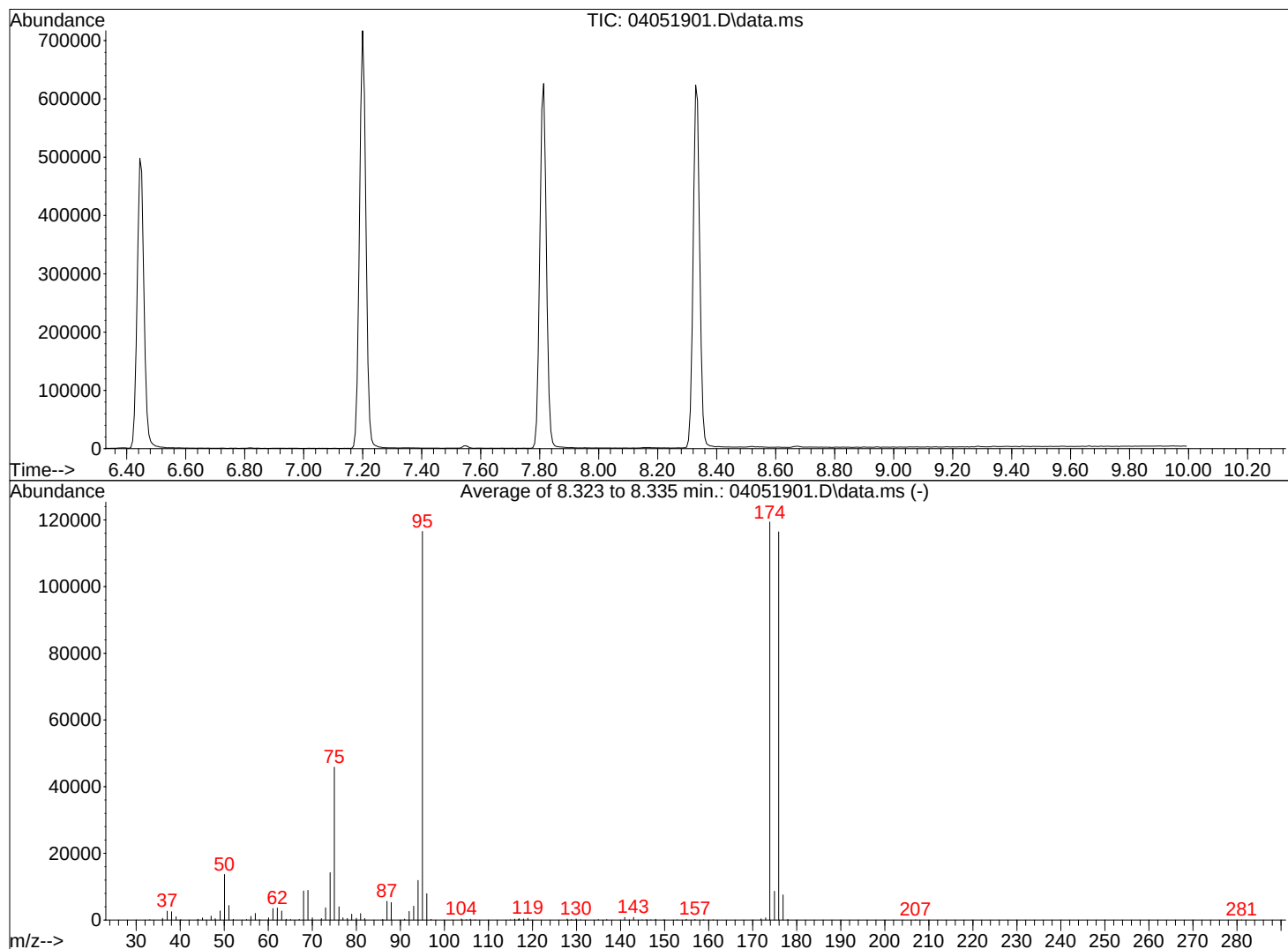
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	11.5	14116	PASS
75	95	30	66	39.6	48472	PASS
95	95	100	100	100.0	122555	PASS
96	95	5	9	6.5	8015	PASS
173	174	0.00	2	0.6	733	PASS
174	95	50	120	107.1	131280	PASS
175	174	4	9	7.0	9194	PASS
176	174	93	101	97.4	127931	PASS
177	176	5	9	6.6	8382	PASS

TD 3/19/19

Data Path : I:\MS19\DATA\2019 04\05\
Data File : 04051901.D
Acq On : 5 Apr 2019 4:33
Operator : TD
Sample : BFB S19040519
Misc : S31-03161901
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : I:\MS19\METHODS\S19031819.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Mar 19 06:44:10 2019



AutoFind: Scans 690, 691, 692; Background Corrected with Scan 683

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	11.7	13682	PASS
75	95	30	66	39.3	45835	PASS
95	95	100	100	100.0	116573	PASS
96	95	5	9	6.8	7927	PASS
173	174	0.00	2	0.6	684	PASS
174	95	50	120	102.4	119397	PASS
175	174	4	9	7.2	8647	PASS
176	174	93	101	97.5	116424	PASS
177	176	5	9	6.5	7531	PASS

TD 4/5/19

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

ALS Project ID: P1901824

Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Internal Standard Area and RT Summary

Test Code: EPA TO-15 SIM

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/7890A/MS19

Lab File ID: 04051902.D

Analyst: Topacio De Leon

Date Analyzed: 4/5/19

Sample Type: 6.0 L Summa Canister(s)

Time Analyzed: 04:53

Test Notes:

	IS1 (BCM)			IS2 (DFB)			IS3 (CBZ)		
	AREA	#	RT	AREA	#	RT	AREA	#	RT
24 Hour Standard	22732		9.62	102140		11.58	12994		15.92
Upper Limit	31825		9.95	142996		11.91	18192		16.25
Lower Limit	13639		9.29	61284		11.25	7796		15.59

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	RT	AREA	RT	AREA	RT
01	Method Blank	20063	9.62	86048	11.58	11159	15.92
02	Lab Control Sample	22046	9.62	98811	11.58	12514	15.91
03	HUCK IA F040219-1	21738	9.62	97630	11.58	12949	15.91
04	HUCK IA F040219-2	22174	9.62	99726	11.58	12991	15.91
05	HUCK IA FR040219-2	22401	9.62	100710	11.58	13077	15.91
06	HUCK IA F040219-3	22372	9.63	102154	11.58	13196	15.92
07	HUCK IA F040219-4	23008	9.64	103695	11.59	14128	15.92
08	HUCK IA F040219-5	21821	9.62	98374	11.58	12451	15.91
09	HUCK IA F040219-6	21119	9.62	95232	11.58	12047	15.91
10	HUCK AA F040219-1	20384	9.62	91507	11.58	11645	15.92
11	HUCK AA F040219-2	20922	9.62	94035	11.58	11740	15.91
12	TRIPBLANK 040219-1	19730	9.63	84793	11.58	11158	15.92
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. See case narrative.

MDLs for TO-15 SIM

Compounds	3/4/15					FINAL	
	MS19	MAX	ROUNDUP	ROUND	MW	MDL _R	MDL _R
	MDL _C	MDL _C (pg/L)	µg/m ³	ppbV		µg/m ³	ppbV
Dichlorodifluoromethane	16.83592	16.8	0.017	0.0034	120.9	0.017	0.0034
Chloromethane	18.21135	18.2	0.019	0.0092	50.49	0.019	0.0092
Vinyl Chloride	7.58639	7.6	0.0076	0.0030	62.5	0.0076	0.0030
1,3-Butadiene	13.69049	13.7	0.014	0.0063	54.09	0.014	0.0063
Bromomethane	9.29658	9.3	0.0093	0.0024	94.94	0.0093	0.0024
Chloroethane	8.41831	8.4	0.0085	0.0032	64.52	0.0085	0.0032
Acrolein	38.60434	38.6	0.039	0.017	56.06	0.039	0.017
Acetone	55.50695	55.5	0.056	0.024	58.08	0.056	0.024
Freon-11	14.85012	14.9	0.015	0.0027	137.4	0.015	0.0027
1,1-Dichloroethene	8.50744	8.5	0.0086	0.0022	96.94	0.0086	0.0022
Methylene Chloride	12.49786	12.5	0.013	0.0037	84.94	0.013	0.0037
Trichlorotrifluoroethane	8.88499	8.9	0.0089	0.0012	187.38	0.0089	0.0012
trans-1,2-Dichloroethene	7.28438	7.3	0.0073	0.0018	96.94	0.0073	0.0018
1,1-Dichloroethane	6.04529	6.0	0.0061	0.0015	98.96	0.0061	0.0015
Methyl tert-Butyl Ether	9.21623	9.2	0.0093	0.0026	88.15	0.0093	0.0026
cis-1,2-Dichloroethene	9.13029	9.1	0.0092	0.0023	96.94	0.0092	0.0023
Chloroform	17.84617	17.8	0.018	0.0037	119.4	0.018	0.0037
1,2-Dichloroethane	8.30576	8.3	0.0084	0.0021	98.96	0.0084	0.0021
1,1,1-Trichloroethane	5.86490	5.9	0.0059	0.0011	133.4	0.0059	0.0011
Benzene	19.22760	19.2	0.020	0.0063	78.11	0.020	0.0063
Carbon Tetrachloride	11.68071	11.7	0.012	0.0019	153.8	0.012	0.0019
1,2-Dichloropropane	7.20823	7.2	0.0073	0.0016	113	0.0073	0.0016
Bromodichloromethane	6.86161	6.9	0.0069	0.0010	163.8	0.0069	0.0010
Trichloroethene	8.42189	8.4	0.0085	0.0016	131.4	0.0085	0.0016
1,4-Dioxane	8.46675	8.5	0.0085	0.0024	88.11	0.0085	0.0024
cis-1,3-Dichloropropene	6.10793	6.1	0.0062	0.0014	111	0.0062	0.0014
trans-1,3-Dichloropropene	5.43513	5.4	0.0055	0.0012	111	0.0055	0.0012
1,1,2-Trichloroethane	7.80181	7.8	0.0079	0.0014	133.4	0.0079	0.0014
Toluene	10.90331	10.9	0.011	0.0029	92.14	0.011	0.0029
Dibromochloromethane	8.76683	8.8	0.0088	0.0010	208.3	0.0088	0.0010
1,2-Dibromoethane	7.84155	7.8	0.0079	0.0010	187.9	0.0079	0.0010
Tetrachloroethene	8.19431	8.2	0.0082	0.0012	165.8	0.0082	0.0012
Chlorobenzene	9.14281	9.1	0.0092	0.0020	112.6	0.0092	0.0020
Ethylbenzene	9.66221	9.7	0.0097	0.0022	106.2	0.0097	0.0022
m- & p-Xylene	18.54585	18.5	0.019	0.0044	106.2	0.019	0.0044
Styrene	7.34212	7.3	0.0074	0.0017	104.1	0.0074	0.0017
o-Xylene	8.82357	8.8	0.0089	0.0020	106.2	0.0089	0.0020
1,1,2,2-Tetrachloroethane	7.10728	7.1	0.0072	0.0010	167.9	0.0072	0.0010
1,3,5-Trimethylbenzene	7.23716	7.2	0.0073	0.0015	120.2	0.0073	0.0015
1,2,4-Trimethylbenzene	8.28144	8.3	0.0083	0.0017	120.2	0.0083	0.0017
1,3-Dichlorobenzene	8.46780	8.5	0.0085	0.0014	147	0.0085	0.0014
1,4-Dichlorobenzene	8.06956	8.1	0.0081	0.0013	147	0.0081	0.0013
1,2-Dichlorobenzene	8.28388	8.3	0.0083	0.0014	147	0.0083	0.0014
1,2-Dibromo-3-Chloropropane	9.42439	9.4	0.0095	0.00098	236.33	0.0095	0.00098
1,2,4-Trichlorobenzene	12.88668	12.9	0.013	0.0018	181.5	0.013	0.0018
Naphthalene	15.63751	15.6	0.016	0.0031	128.17	0.016	0.0031
Hexachloro-1,3-butadiene	9.19503	9.2	0.0092	0.00086	260.8	0.0092	0.00086

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-1
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-001

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02421

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.55 Final Pressure (psig): 3.80

Container Dilution Factor: 1.52

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.23	0.17	0.014	0.058	0.042	0.0035	
79-01-6	Trichloroethene	6.2	0.17	0.013	1.2	0.031	0.0024	
127-18-4	Tetrachloroethene	1.1	0.17	0.012	0.16	0.025	0.0018	

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.

Data File : I:\MS19\DATA\2019 04\05\04051909.D
 Acq On : 5 Apr 2019 11:03
 Sample : P1901824-001 (1000mL)
 Misc : S31-03161901

Vial: 2
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:09:58 2019

TD 4/9/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21738	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	97630	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12949	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	23686	934.792	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	93.48%
33) Toluene-d8 (SS2)	14.01	98	105665	1041.463	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	104.15%
45) Bromofluorobenzene (SS3)	17.43	174	52748	1070.897	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	107.09%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	61522	1366.645	pg	100
3) Chloromethane	4.53	52	2155	217.530	pg	97
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	1993	61.550	pg	100
5) Vinyl Chloride	4.82	62	287	10.172	pg	97
6) 1,3-Butadiene	0.00	54	0	N.D.	d	
7) Bromomethane	5.34	94	278	13.765	pg	97
8) Chloroethane	5.56	64	126	8.798	pg	# 42
9) Acrolein	6.13	56	4029	367.421	pg	100
10) Acetone	6.26	58	191614	12019.598	pg	# 72
11) Trichlorofluoromethane	6.48	101	25422	736.747	pg	100
12) 1,1-Dichloroethene	7.20	96	109	N.D.		
13) Methylene Chloride	7.34	84	36946	1447.162	pg	94
14) Trichlorotrifluoroethane	7.66	151	6254	270.142	pg	100
15) trans-1,2-Dichloroethene	8.38	96	437	16.599	pg	100
16) 1,1-Dichloroethane	8.59	63	123	N.D.		
17) Methyl tert-Butyl Ether	8.68	73	420	N.D.		
18) cis-1,2-Dichloroethene	9.46	96	4267	152.385	pg	99
19) Chloroform	9.76	83	8957	206.332	pg	97
21) 1,2-Dichloroethane	10.51	62	3488	136.463	pg	98
22) 1,1,1-Trichloroethane	10.78	97	1663	46.018	pg	99
23) Benzene	11.23	78	120040	1117.966	pg	99
24) Carbon Tetrachloride	11.39	117	7890	231.847	pg	100
26) 1,2-Dichloropropane	12.05	63	369	16.539	pg	97
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	126183	4081.124	pg	99
29) 1,4-Dioxane	0.00	88	0	N.D.	d	
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	13.60	75	91	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.11	91	1472335	13671.316	pg	99
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.26	166	24100	725.012	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	352793	2942.986	pg	100
41) m,p-Xylene	16.52	91	957249	10630.204	pg	100
42) Styrene	16.88	104	11170	165.874	pg	100
43) o-Xylene	17.00	106	190785	4001.107	pg	99
44) 1,1,2,2-Tetrachloroethane	17.00	83	302	N.D.		
46) 1,3,5-Trimethylbenzene	18.26	105	116877	1123.694	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	398605	3932.627	pg	89
48) 1,3-Dichlorobenzene	18.80	146	57	N.D.		
49) 1,4-Dichlorobenzene	18.87	146	165018	2402.154	pg	100
50) 1,2-Dichlorobenzene	19.20	146	227	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	147	N.D.		
53) Naphthalene	20.94	128	97955	722.060	pg	99

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Data File : I:\MS19\DATA\2019 04\05\04051909.D
Acq On : 5 Apr 2019 11:03
Sample : P1901824-001 (1000mL)
Misc : S31-03161901

Vial: 2
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:09:58 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

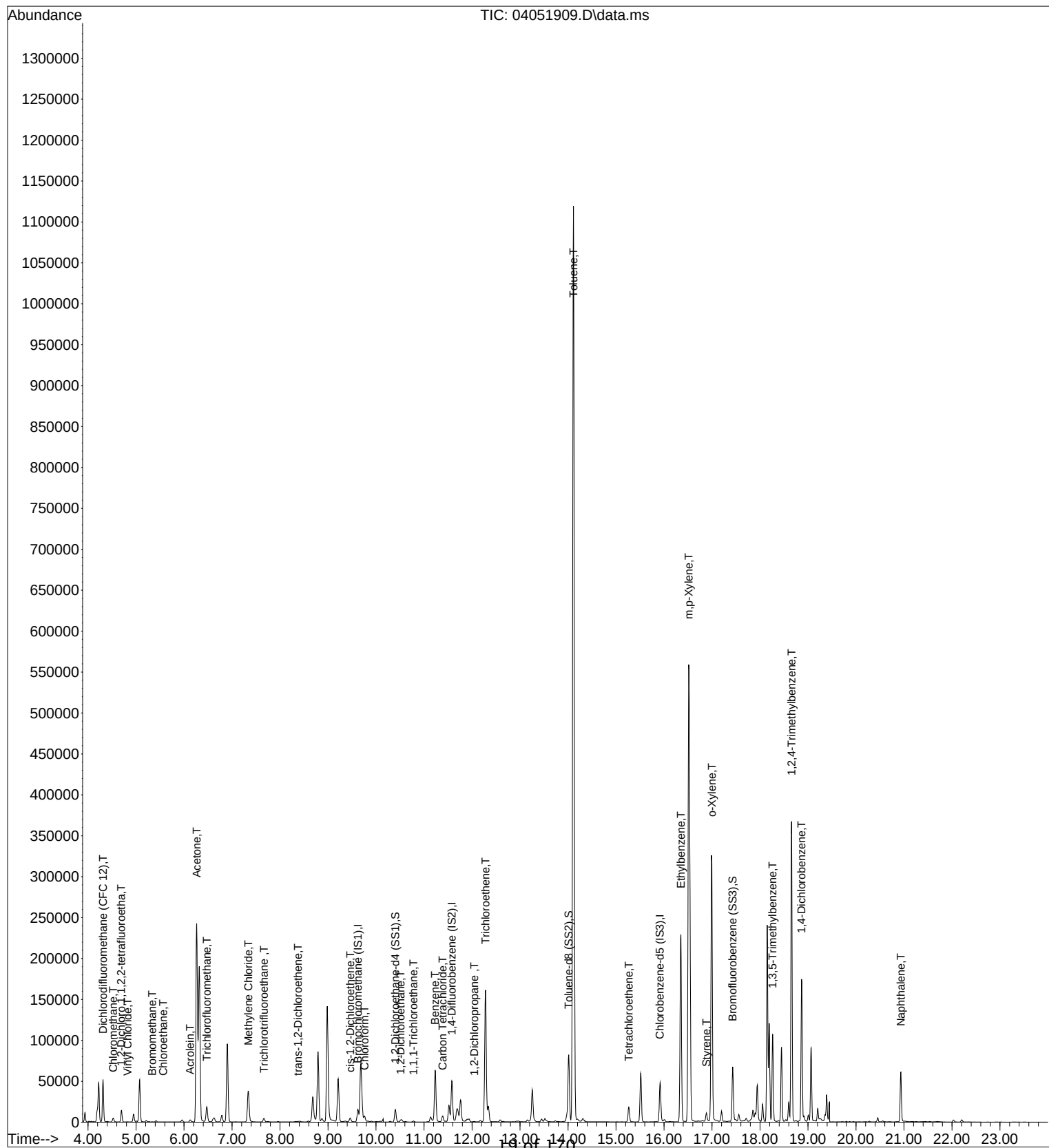
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	73	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051909.D
Acq On : 5 Apr 2019 11:03
Sample : P1901824-001 (1000mL)
Misc : S31-03161901

Vial: 2
Operator: TD
Inst : MS19

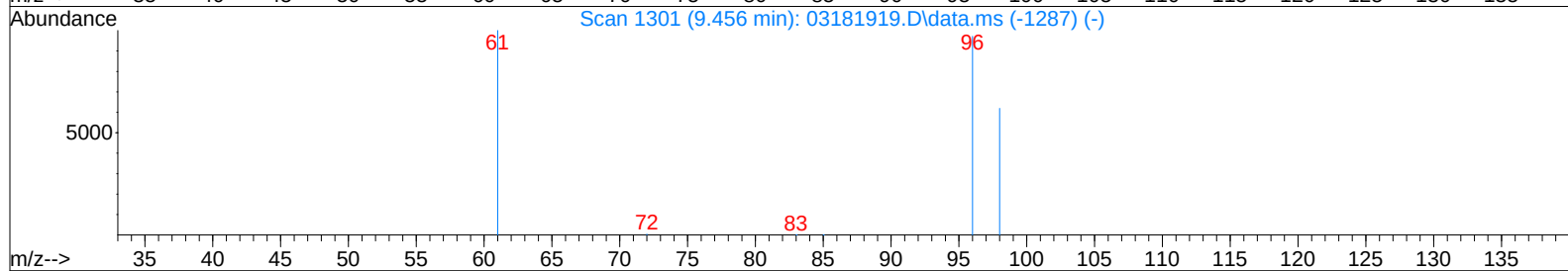
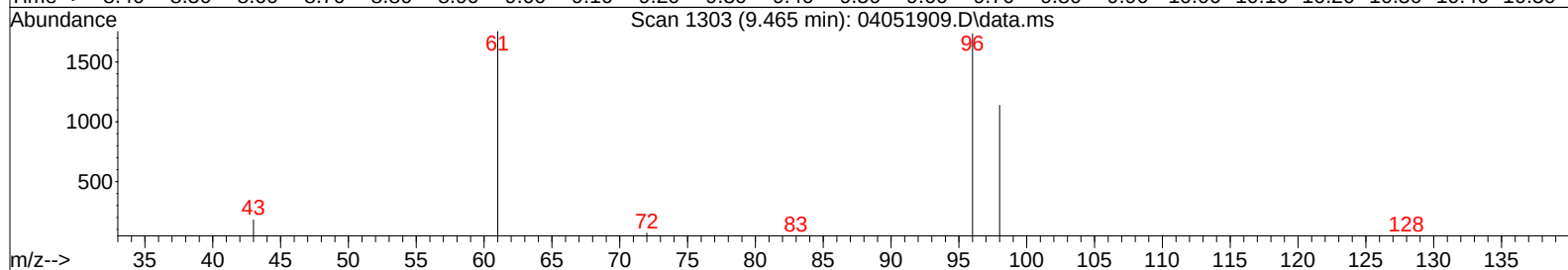
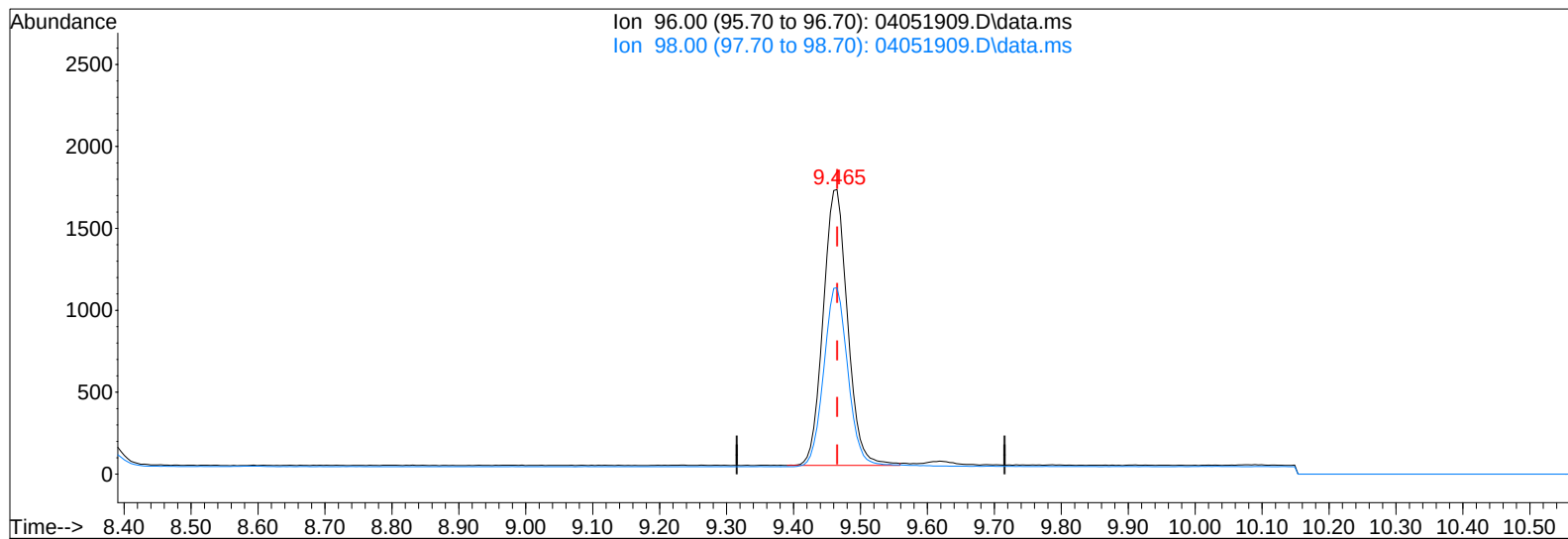
Quant Time: Apr 09 10:09:58 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051909.D
Acq On : 5 Apr 2019 11:03
Sample : P1901824-001 (1000mL)
Misc : S31-03161901

Vial: 2
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:14 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051909.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.465min (-0.001) 152.39pg

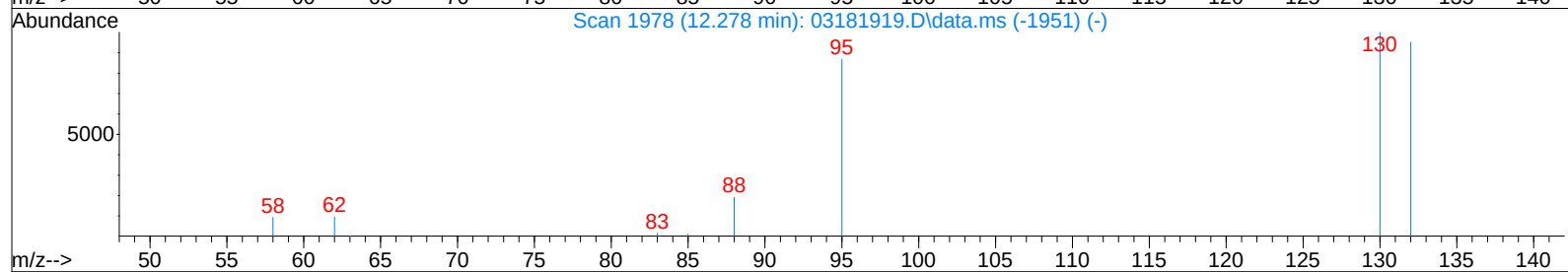
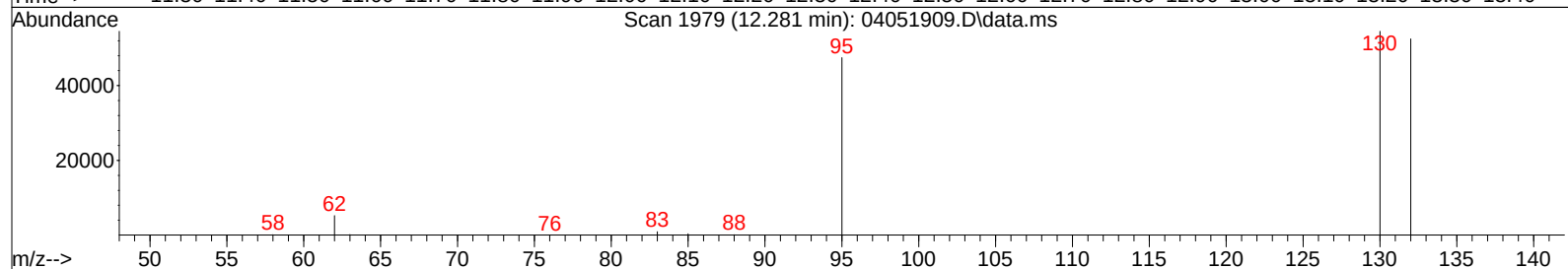
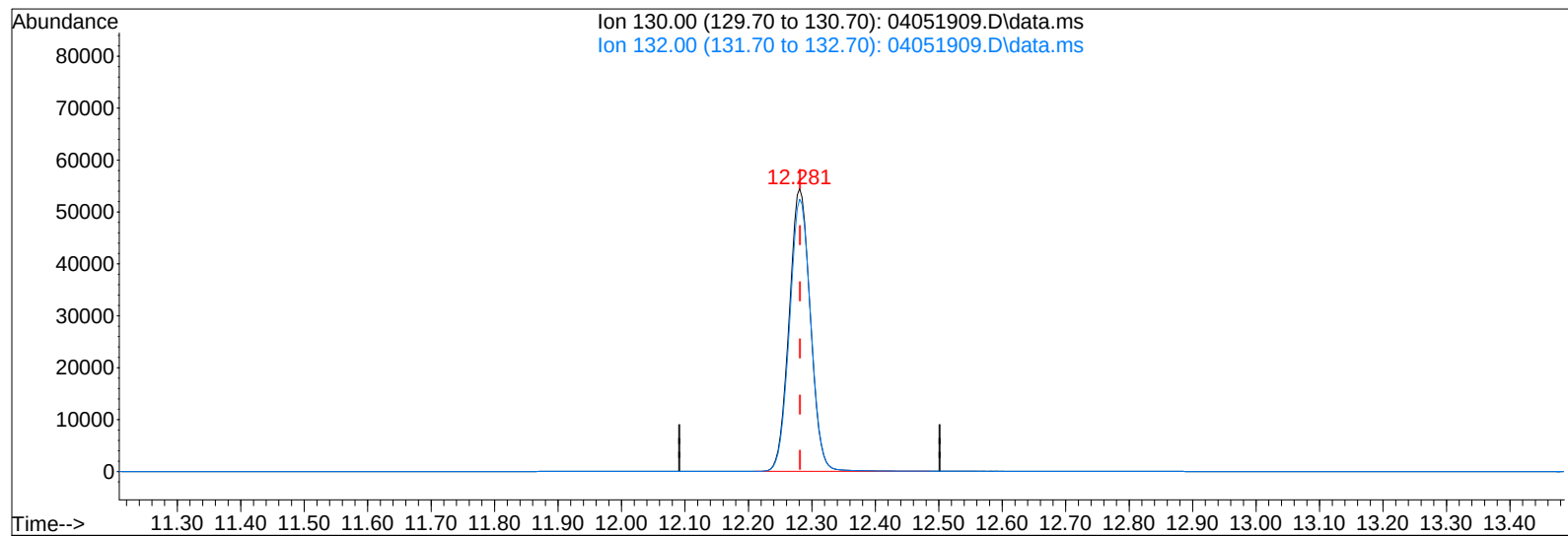
response 4267

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	65.15
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051909.D
Acq On : 5 Apr 2019 11:03
Sample : P1901824-001 (1000mL)
Misc : S31-03161901

Vial: 2
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:14 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051909.D\data.ms

(28) Trichloroethene (T)

12.281min (-0.001) 4081.12pg

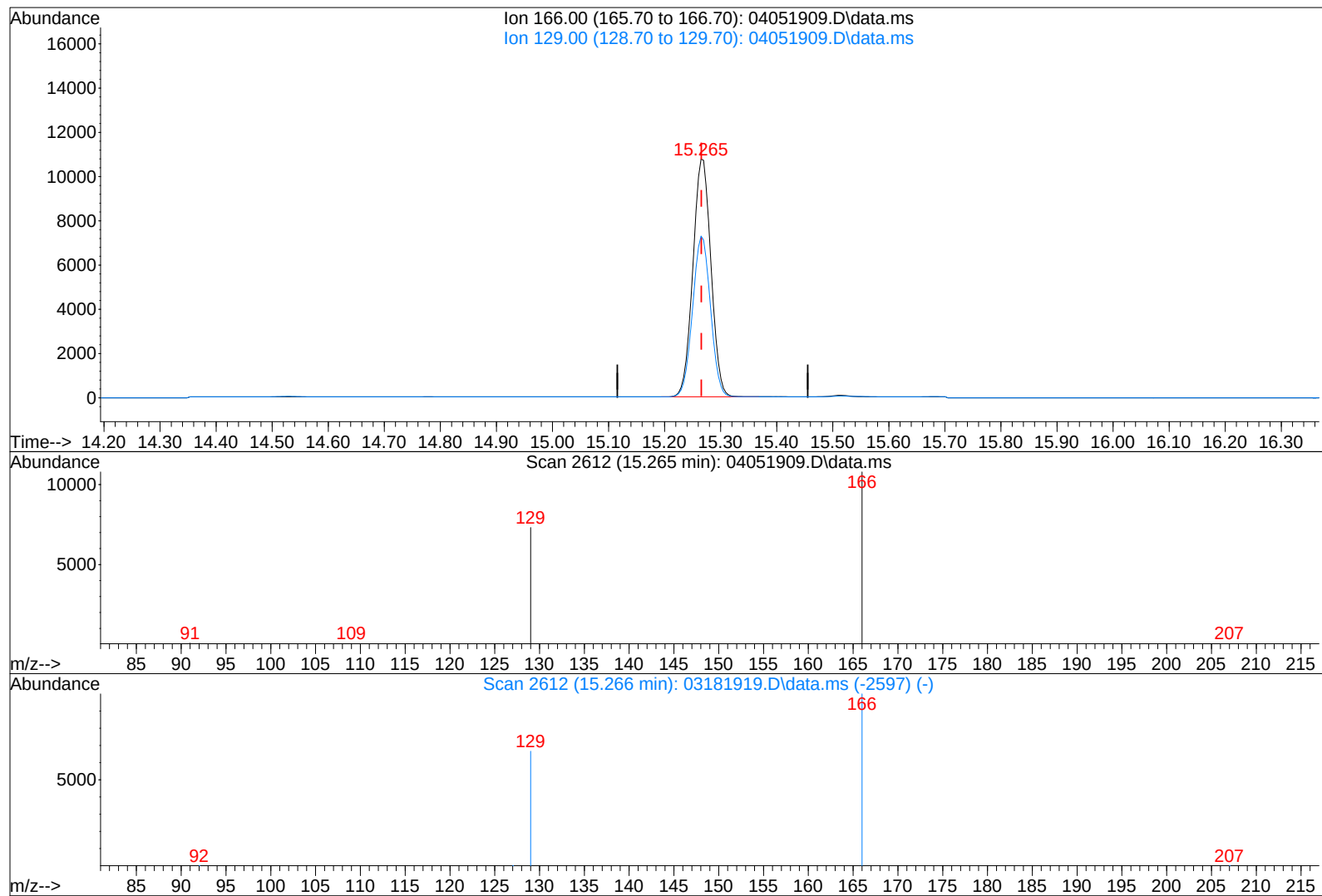
response 126183

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.37
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051909.D
Acq On : 5 Apr 2019 11:03
Sample : P1901824-001 (1000mL)
Misc : S31-03161901

Vial: 2
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:14 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051909.D\data.ms

(37) Tetrachloroethene (T)

15.265min (-0.001) 725.01pg

response 24100

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.98
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-2
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-002

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02455

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.46 Final Pressure (psig): 3.86

Container Dilution Factor: 1.52

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.20	0.17	0.014	0.051	0.042	0.0035	
79-01-6	Trichloroethene	5.5	0.17	0.013	1.0	0.031	0.0024	
127-18-4	Tetrachloroethene	0.98	0.17	0.012	0.15	0.025	0.0018	

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.

Data File : I:\MS19\DATA\2019 04\05\04051910.D
 Acq On : 5 Apr 2019 11:35
 Sample : P1901824-002 (1000mL)
 Misc : S31-03161901

Vial: 3
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:21:27 2019

TD 4/9/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	22174	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	99726	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12991	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	23753	919.004	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	91.90%
33) Toluene-d8 (SS2)	14.01	98	107272	1035.080	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	103.51%
45) Bromofluorobenzene (SS3)	17.43	174	54029	1093.358	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	109.34%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.30	85	63705	1387.312	pg	100
3) Chloromethane	4.51	52	2395	237.002	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	2084	63.095	pg	100
5) Vinyl Chloride	4.81	62	313	10.876	pg	91
6) 1,3-Butadiene	5.07	54	1568	73.777	pg	# 1
7) Bromomethane	5.33	94	290	14.077	pg	91
8) Chloroethane	5.55	64	146	9.994	pg	# 42
9) Acrolein	6.12	56	4144	370.477	pg	100
10) Acetone	6.26	58	206200	12680.223	pg	# 75
11) Trichlorofluoromethane	6.47	101	25837	734.051	pg	100
12) 1,1-Dichloroethene	7.19	96	90	N.D.		
13) Methylene Chloride	7.34	84	38780	1489.131	pg	93
14) Trichlorotrifluoroethane	7.66	151	6347	268.768	pg	100
15) trans-1,2-Dichloroethene	8.38	96	403	15.006	pg	99
16) 1,1-Dichloroethane	8.59	63	111	N.D.		
17) Methyl tert-Butyl Ether	8.68	73	388	N.D.		
18) cis-1,2-Dichloroethene	9.46	96	3811	133.424	pg	100
19) Chloroform	9.76	83	8887	200.694	pg	98
21) 1,2-Dichloroethane	10.51	62	3506	134.470	pg	98
22) 1,1,1-Trichloroethane	10.78	97	1522	41.288	pg	99
23) Benzene	11.23	78	108665	992.128	pg	99
24) Carbon Tetrachloride	11.39	117	8170	235.355	pg	100
26) 1,2-Dichloropropane	12.05	63	405	17.771	pg	98
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	113678	3599.401	pg	99
29) 1,4-Dioxane	0.00	88	0	N.D.	d	
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	13.60	75	60	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.11	91	1316648	11968.735	pg	99
35) Dibromochloromethane	14.52	129	55	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	21966	646.925	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	317205	2637.557	pg	99
41) m,p-Xylene	16.52	91	862441	9546.402	pg	100
42) Styrene	16.88	104	12525	185.394	pg	97
43) o-Xylene	17.00	106	169694	3547.285	pg	99
44) 1,1,2,2-Tetrachloroethane	17.00	83	231	N.D.		
46) 1,3,5-Trimethylbenzene	18.26	105	104409	1000.577	pg	100
47) 1,2,4-Trimethylbenzene	18.65	105	363171	3571.452	pg	89
48) 1,3-Dichlorobenzene	18.81	146	62	N.D.		
49) 1,4-Dichlorobenzene	18.87	146	185910	2697.528	pg	100
50) 1,2-Dichlorobenzene	19.19	146	209	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	274	N.D.		
53) Naphthalene	20.93	128	190750	1401.539	pg	99

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Data File : I:\MS19\DATA\2019 04\05\04051910.D
Acq On : 5 Apr 2019 11:35
Sample : P1901824-002 (1000mL)
Misc : S31-03161901

Vial: 3
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:21:27 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

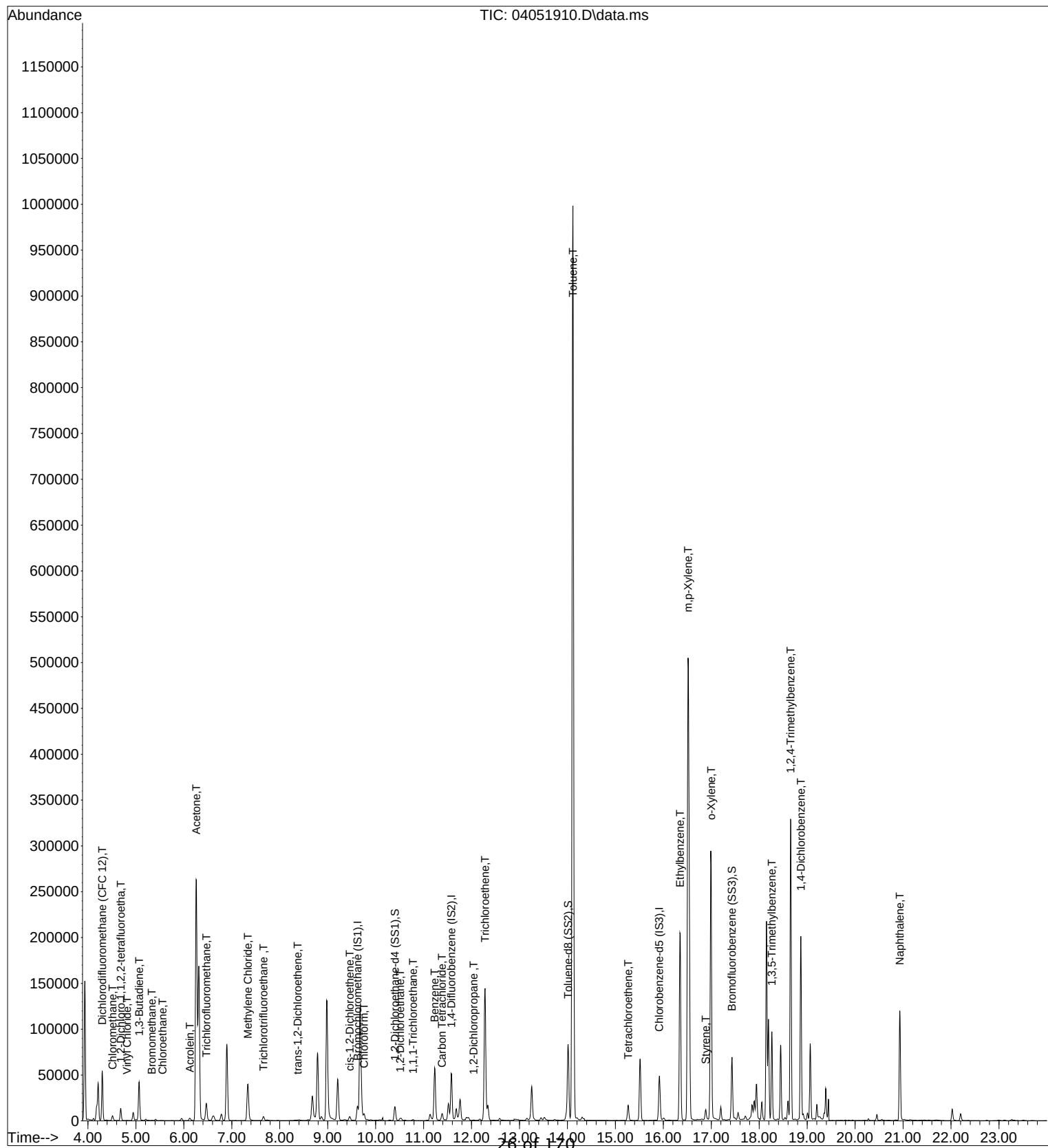
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	69	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051910.D
Acq On : 5 Apr 2019 11:35
Sample : P1901824-002 (1000mL)
Misc : S31-03161901

Vial: 3
Operator: TD
Inst : MS19

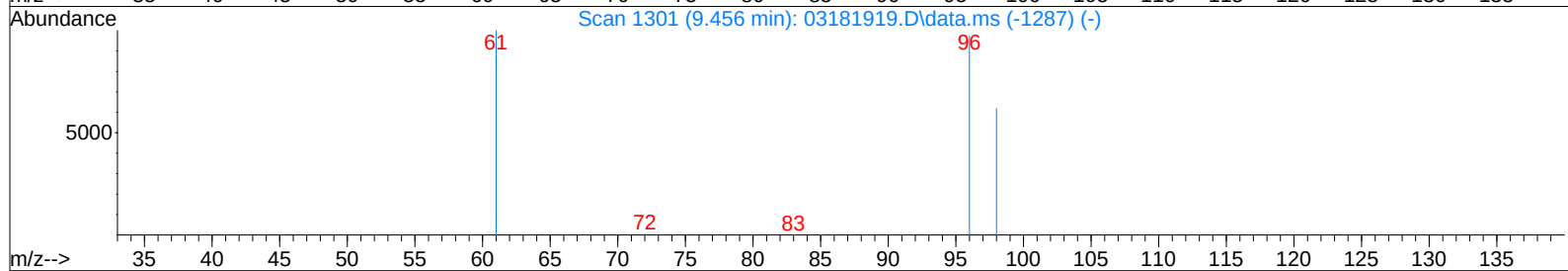
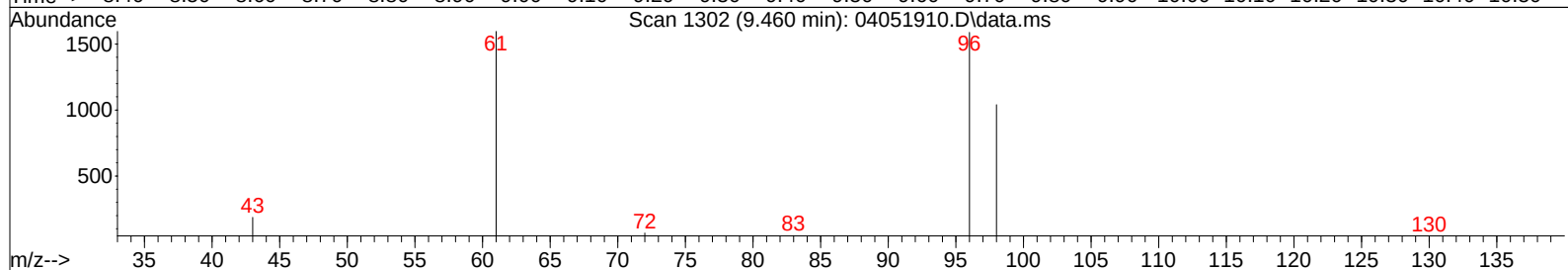
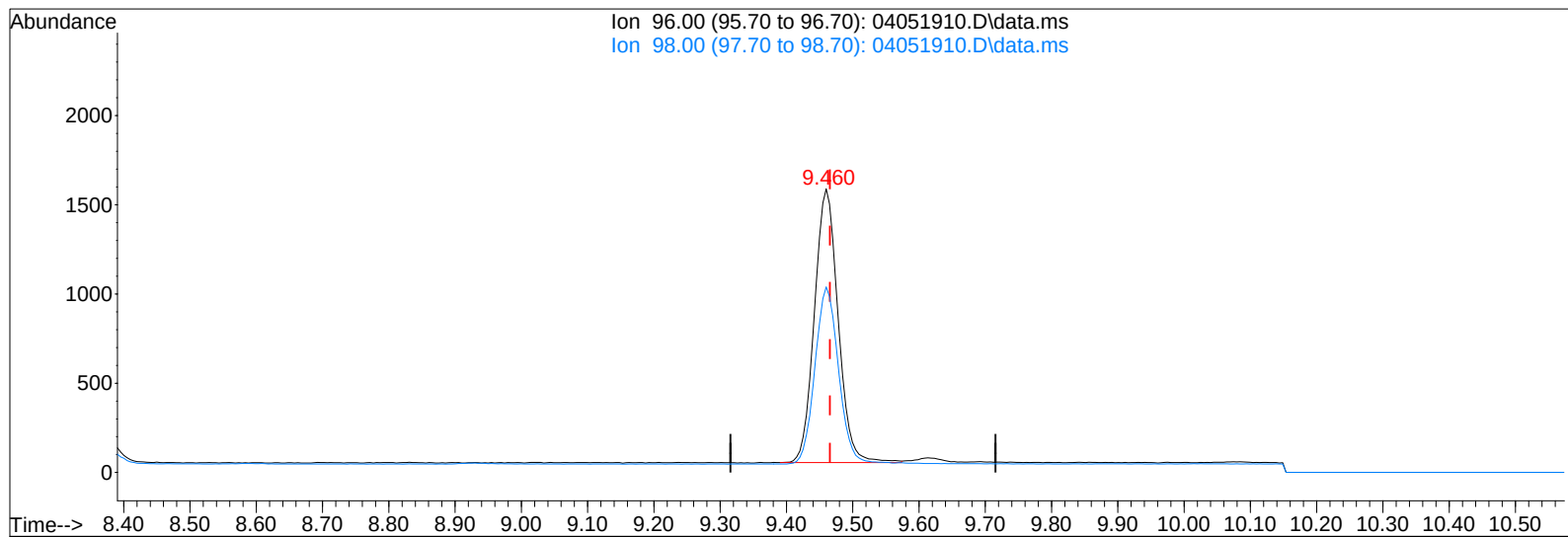
Quant Time: Apr 09 10:21:27 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051910.D
Acq On : 5 Apr 2019 11:35
Sample : P1901824-002 (1000mL)
Misc : S31-03161901

Vial: 3
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:15 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051910.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.460min (-0.006) 133.42pg

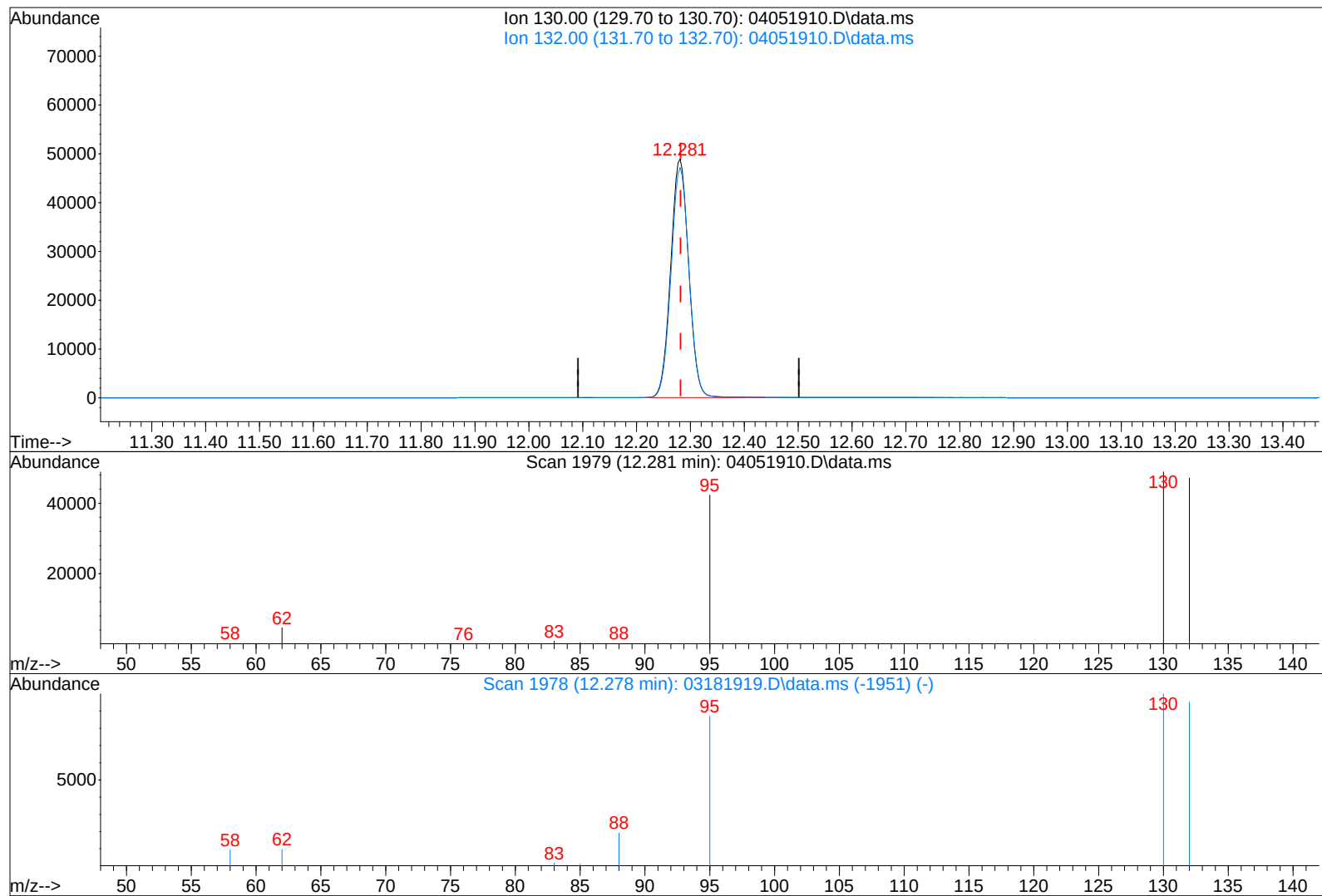
response 3811

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	64.50
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051910.D
Acq On : 5 Apr 2019 11:35
Sample : P1901824-002 (1000mL)
Misc : S31-03161901

Vial: 3
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:15 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051910.D\data.ms

(28) Trichloroethene (T)

12.281min (-0.001) 3599.40pg

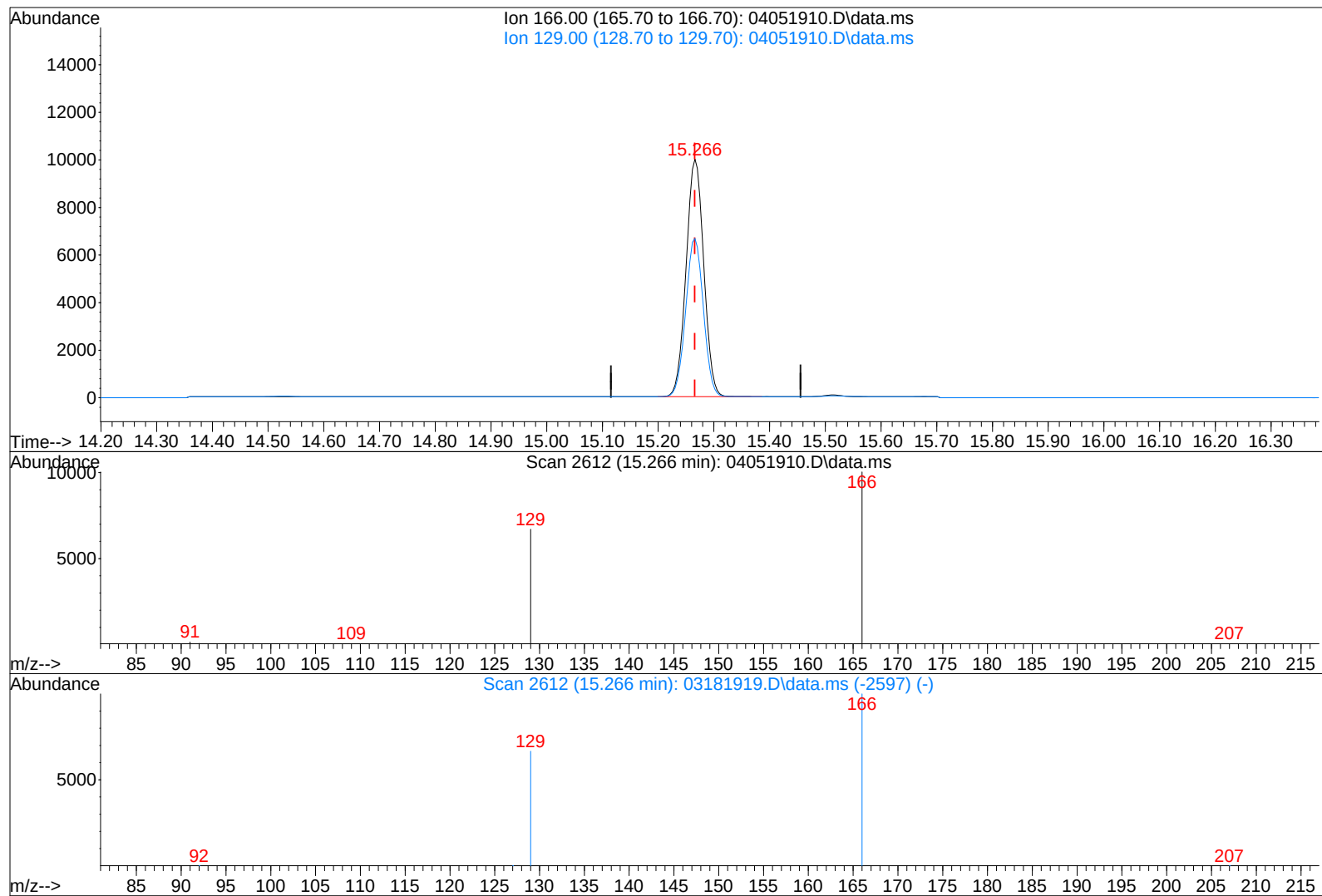
response 113678

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.31
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051910.D
Acq On : 5 Apr 2019 11:35
Sample : P1901824-002 (1000mL)
Misc : S31-03161901

Vial: 3
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:15 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051910.D\data.ms

(37) Tetrachloroethene (T)

15.266min (+0.000) 646.93pg

response 21966

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.79
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

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Client: WSP Group
Client Sample ID: HUCK IA FR040219-2
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-003

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC01830

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.92 Final Pressure (psig): 3.83

Container Dilution Factor: 1.57

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.20	0.17	0.014	0.050	0.044	0.0036	
79-01-6	Trichloroethene	5.4	0.17	0.013	1.0	0.032	0.0025	
127-18-4	Tetrachloroethene	0.97	0.17	0.013	0.14	0.025	0.0019	

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.

Data File : I:\MS19\DATA\2019 04\05\04051911.D
 Acq On : 5 Apr 2019 12:06
 Sample : P1901824-003 (1000mL)
 Misc : S31-03161901

Vial: 4
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:22:56 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

TD 4/9/19

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	22401	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	100710	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	13077	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	23622	904.674	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	90.47%
33) Toluene-d8 (SS2)	14.01	98	108065	1032.544	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	103.25%
45) Bromofluorobenzene (SS3)	17.43	174	55167	1109.045	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	110.90%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	61056	1316.151	pg	100
3) Chloromethane	4.52	52	2243	219.711	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.70	85	2001	59.968	pg	100
5) Vinyl Chloride	4.82	62	302	10.387	pg	94
6) 1,3-Butadiene	0.00	54	0	N.D.	d	
7) Bromomethane	5.34	94	275	13.214	pg	90
8) Chloroethane	5.56	64	134	9.080	pg	# 42
9) Acrolein	6.13	56	3905	345.573	pg	99
10) Acetone	6.26	58	197827	12042.050	pg	# 77
11) Trichlorofluoromethane	6.47	101	24762	696.380	pg	100
12) 1,1-Dichloroethene	7.20	96	80	N.D.		
13) Methylene Chloride	7.34	84	38430	1460.738	pg	92
14) Trichlorotrifluoroethane	7.66	151	6185	259.254	pg	100
15) trans-1,2-Dichloroethene	8.38	96	392	14.449	pg	96
16) 1,1-Dichloroethane	8.59	63	113	N.D.		
17) Methyl tert-Butyl Ether	8.68	73	378	N.D.		
18) cis-1,2-Dichloroethene	9.46	96	3673	127.290	pg	99
19) Chloroform	9.76	83	8521	190.479	pg	98
21) 1,2-Dichloroethane	10.51	62	3326	126.274	pg	98
22) 1,1,1-Trichloroethane	10.78	97	1457	39.124	pg	100
23) Benzene	11.23	78	103399	934.482	pg	99
24) Carbon Tetrachloride	11.39	117	7814	222.818	pg	100
26) 1,2-Dichloropropane	12.05	63	354	15.382	pg	98
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	109784	3442.141	pg	99
29) 1,4-Dioxane	0.00	88	0	N.D.	d	
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	13.60	75	194	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.11	91	1255878	11304.773	pg	99
35) Dibromochloromethane	14.53	129	51	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	21254	619.840	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	307916	2543.481	pg	99
41) m,p-Xylene	16.52	91	833229	9162.398	pg	99
42) Styrene	16.88	104	12984	190.924	pg	100
43) o-Xylene	16.99	106	164347	3412.918	pg	99
44) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	d	
46) 1,3,5-Trimethylbenzene	18.26	105	101418	965.522	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	351664	3435.548	pg	89
48) 1,3-Dichlorobenzene	18.81	146	66	N.D.		
49) 1,4-Dichlorobenzene	18.87	146	177129	2553.215	pg	100
50) 1,2-Dichlorobenzene	19.20	146	225	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	195	N.D.		
53) Naphthalene	20.93	128	177125	1292.870	pg	99

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Data File : I:\MS19\DATA\2019 04\05\04051911.D
Acq On : 5 Apr 2019 12:06
Sample : P1901824-003 (1000mL)
Misc : S31-03161901

Vial: 4
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:22:56 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

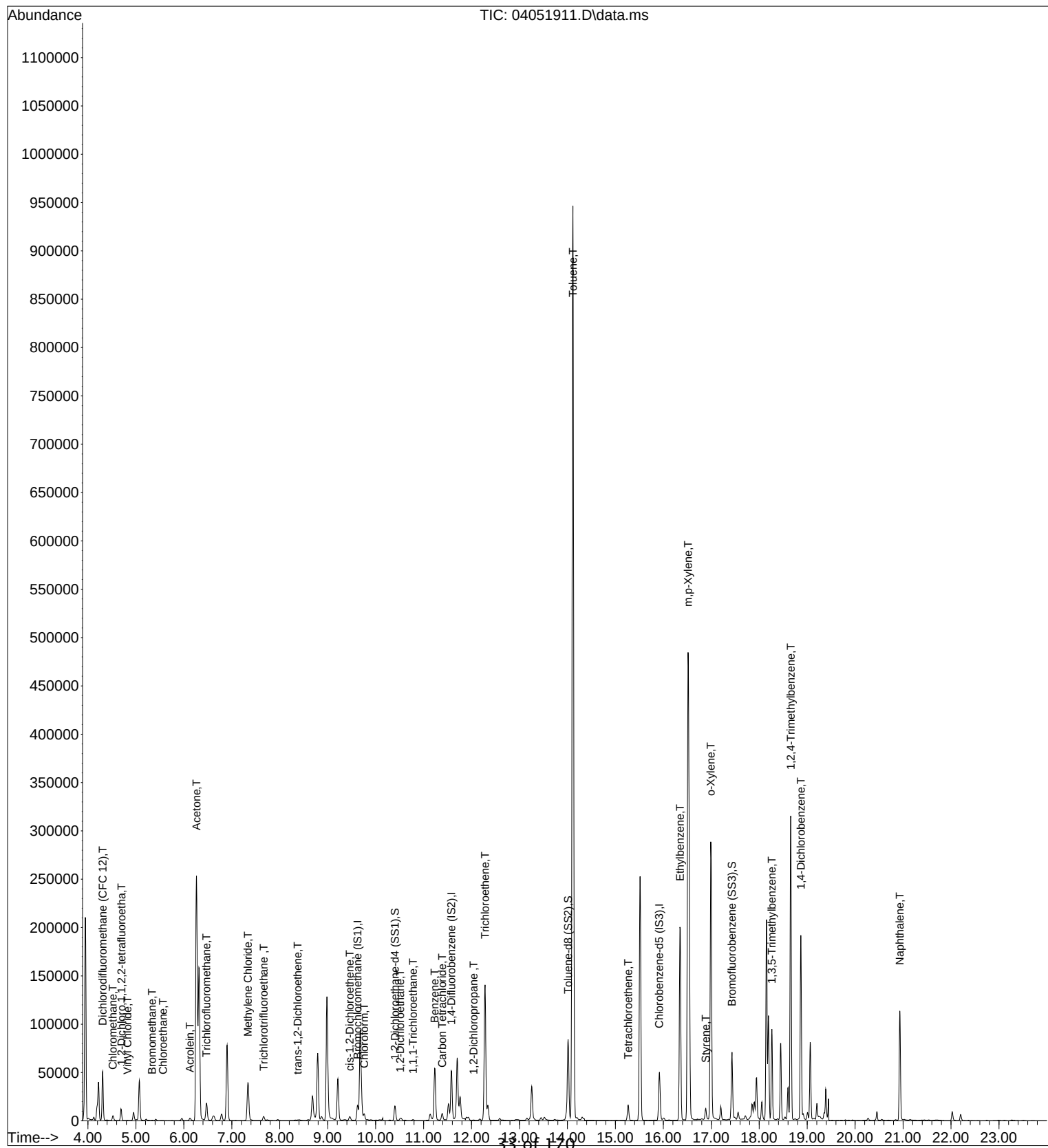
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	72	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051911.D
Acq On : 5 Apr 2019 12:06
Sample : P1901824-003 (1000mL)
Misc : S31-03161901

Vial: 4
Operator: TD
Inst : MS19

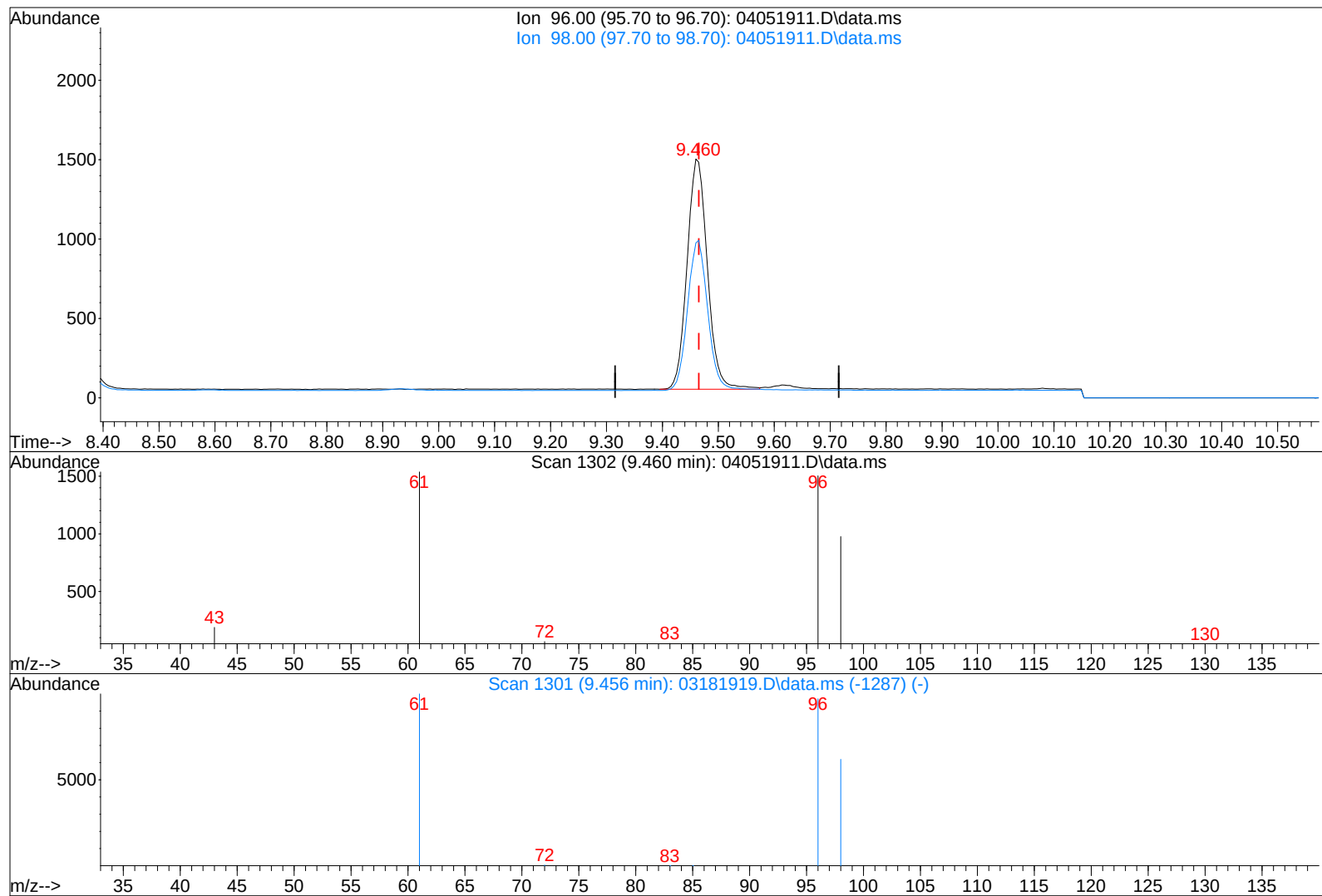
Quant Time: Apr 09 10:22:56 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051911.D
Acq On : 5 Apr 2019 12:06
Sample : P1901824-003 (1000mL)
Misc : S31-03161901

Vial: 4
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:26 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051911.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.460min (-0.006) 127.29pg

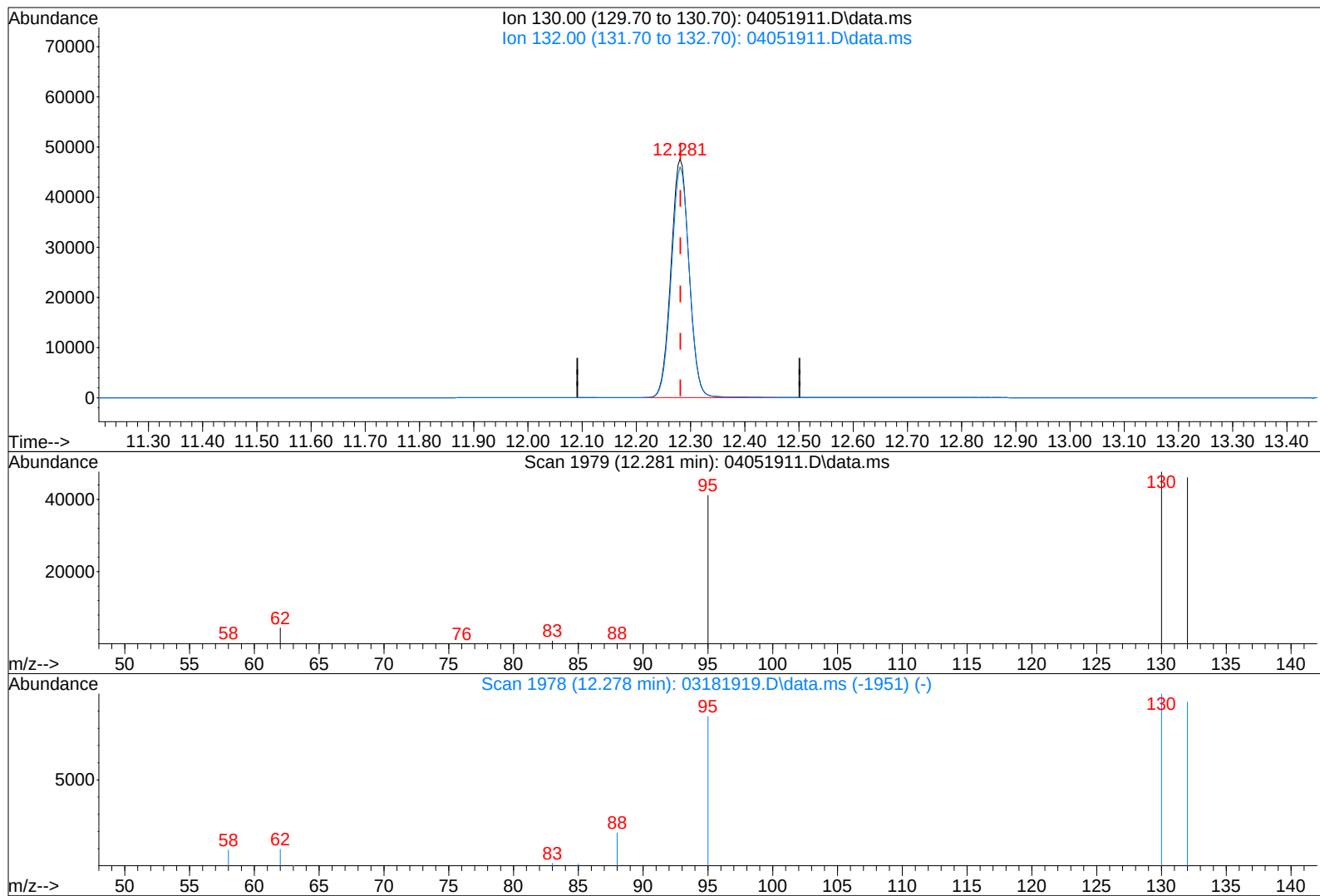
response 3673

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	65.07
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051911.D
Acq On : 5 Apr 2019 12:06
Sample : P1901824-003 (1000mL)
Misc : S31-03161901

Vial: 4
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:26 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051911.D\data.ms

(28) Trichloroethene (T)

12.281min (-0.001) 3442.14pg

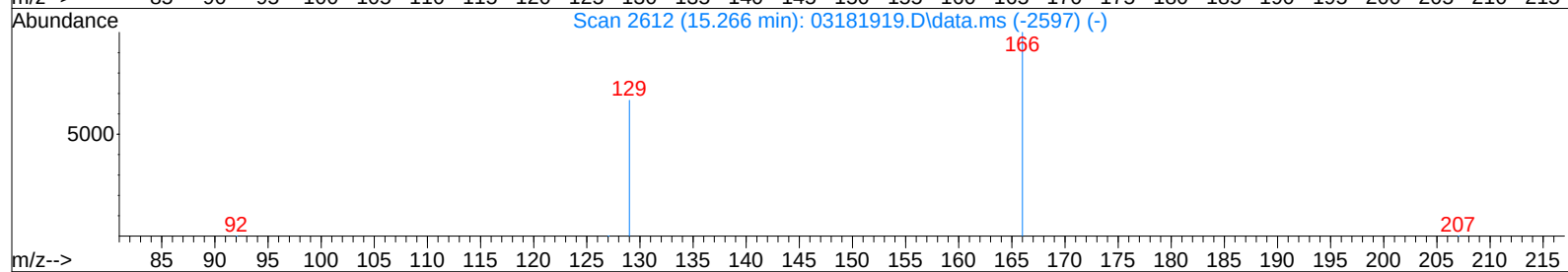
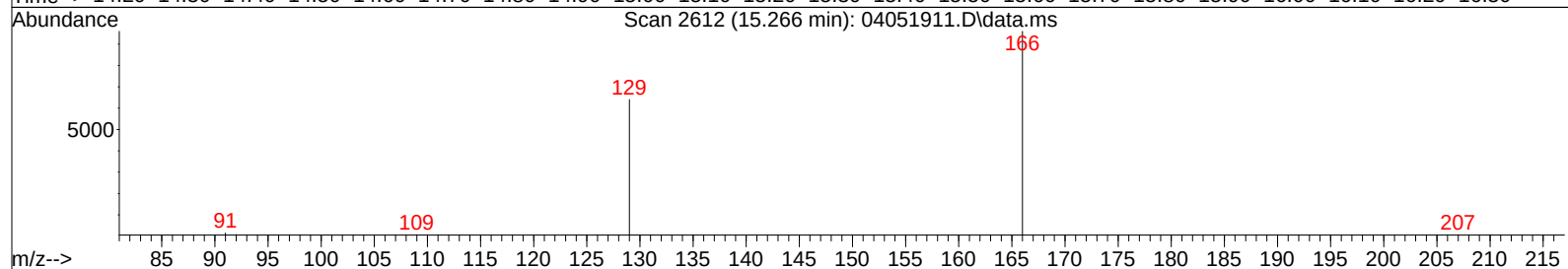
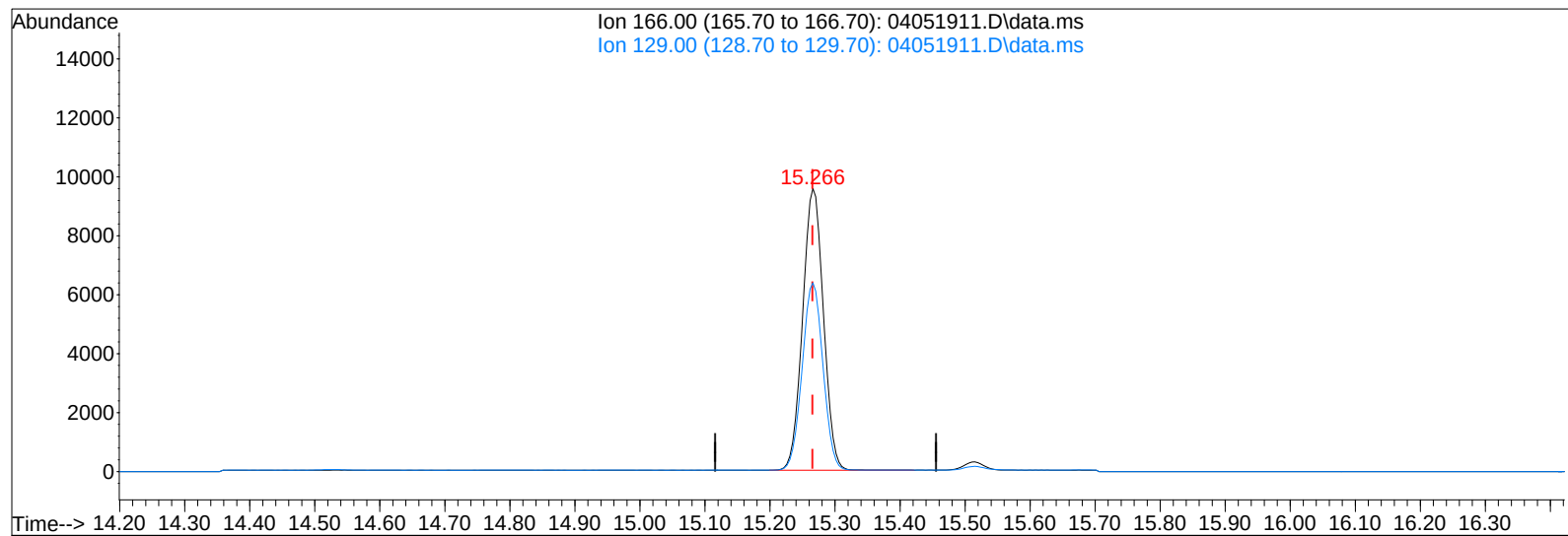
response 109784

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.40
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051911.D
Acq On : 5 Apr 2019 12:06
Sample : P1901824-003 (1000mL)
Misc : S31-03161901

Vial: 4
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:26 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051911.D\data.ms

(37) Tetrachloroethene (T)

15.266min (+0.000) 619.84pg

response 21254

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.50
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-3
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-004

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02456

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.49 Final Pressure (psig): 3.90

Container Dilution Factor: 1.52

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.35	0.17	0.014	0.088	0.042	0.0035	
79-01-6	Trichloroethene	6.8	0.17	0.013	1.3	0.031	0.0024	
127-18-4	Tetrachloroethene	1.4	0.17	0.012	0.20	0.025	0.0018	

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.

Data File : I:\MS19\DATA\2019 04\05\04051912.D
 Acq On : 5 Apr 2019 12:37
 Sample : P1901824-004 (1000mL)
 Misc : S31-03161901

Vial: 5
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:25:02 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/9/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.63	130	22372	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	102154	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	13196	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.41	65	22880	877.393	pg	0.01
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	87.74%
33) Toluene-d8 (SS2)	14.02	98	108699	1023.920	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	102.39%
45) Bromofluorobenzene (SS3)	17.43	174	55049	1096.693	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	109.67%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	61825	1334.456	pg	100
3) Chloromethane	4.53	52	2442	239.514	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	1944	58.335	pg	100
5) Vinyl Chloride	4.83	62	144	N.D.		
6) 1,3-Butadiene	0.00	54	0	N.D.	d	
7) Bromomethane	5.34	94	274	13.183	pg	96
8) Chloroethane	5.56	64	238	16.147	pg	97
9) Acrolein	6.13	56	3776	334.590	pg	99
10) Acetone	6.26	58	280085	17071.329	pg	# 66
11) Trichlorofluoromethane	6.48	101	26268	739.691	pg	100
12) 1,1-Dichloroethene	7.19	96	113	N.D.		
13) Methylene Chloride	7.35	84	36351	1383.505	pg	91
14) Trichlorotrifluoroethane	7.67	151	6088	255.519	pg	100
15) trans-1,2-Dichloroethene	8.38	96	668	24.654	pg	99
16) 1,1-Dichloroethane	8.59	63	110	N.D.		
17) Methyl tert-Butyl Ether	0.00	73	0	N.D.	d	
18) cis-1,2-Dichloroethene	9.47	96	6634	230.203	pg	99
19) Chloroform	9.77	83	14090	315.377	pg	95
21) 1,2-Dichloroethane	10.52	62	3016	114.653	pg	98
22) 1,1,1-Trichloroethane	10.78	97	661	17.773	pg	97
23) Benzene	11.24	78	280498	2538.324	pg	99
24) Carbon Tetrachloride	11.39	117	7998	228.361	pg	100
26) 1,2-Dichloropropane	12.05	63	544	23.303	pg	99
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.29	130	144995	4481.876	pg	99
29) 1,4-Dioxane	0.00	88	0	N.D.	d	
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.11	91	3623999	32160.269	pg	98
35) Dibromochloromethane	14.53	129	62	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	31621	909.142	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	784290	6420.056	pg	99
41) m,p-Xylene	16.52	91	2240375	24413.572	pg	99
42) Styrene	16.88	104	7470	108.852	pg	# 76
43) o-Xylene	17.00	106	484333	9967.217	pg	98
44) 1,1,2,2-Tetrachloroethane	17.00	83	81	N.D.		
46) 1,3,5-Trimethylbenzene	18.26	105	275793	2601.934	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	889784	8614.270	pg	89
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
49) 1,4-Dichlorobenzene	18.87	146	318111	4544.041	pg	100
50) 1,2-Dichlorobenzene	19.20	146	502	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	98	N.D.		
53) Naphthalene	20.94	128	25823	186.787	pg	87

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Data File : I:\MS19\DATA\2019 04\05\04051912.D
Acq On : 5 Apr 2019 12:37
Sample : P1901824-004 (1000mL)
Misc : S31-03161901

Vial: 5
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:25:02 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

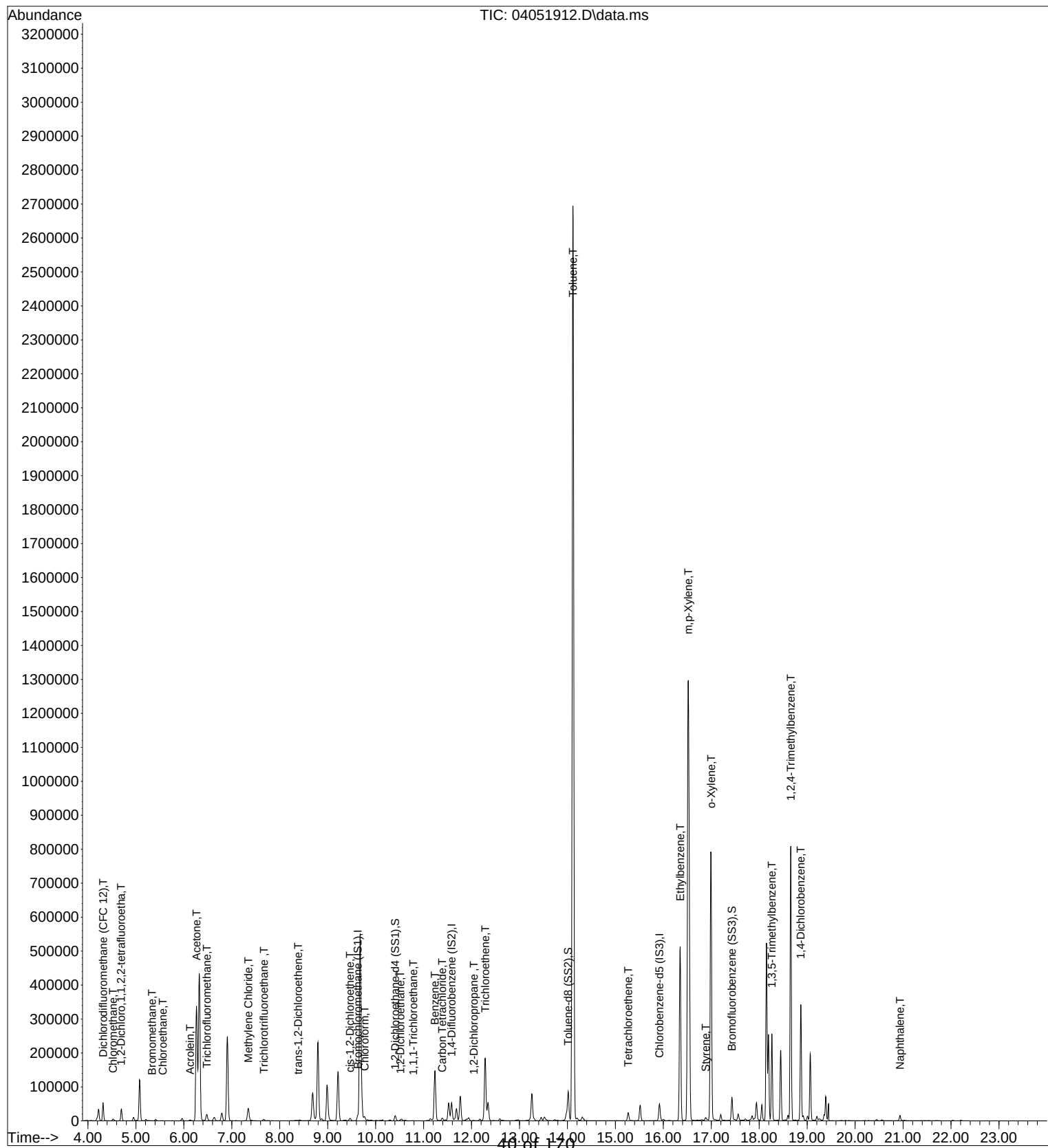
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	56	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051912.D
Acq On : 5 Apr 2019 12:37
Sample : P1901824-004 (1000mL)
Misc : S31-03161901

Vial: 5
Operator: TD
Inst : MS19

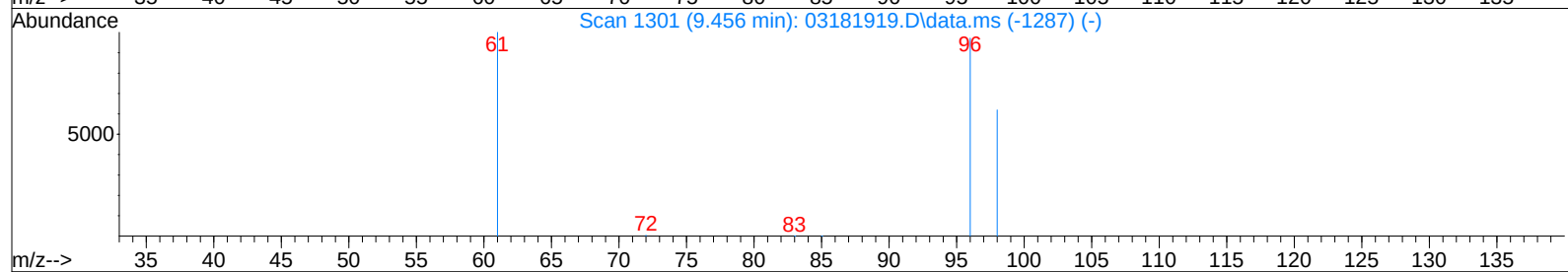
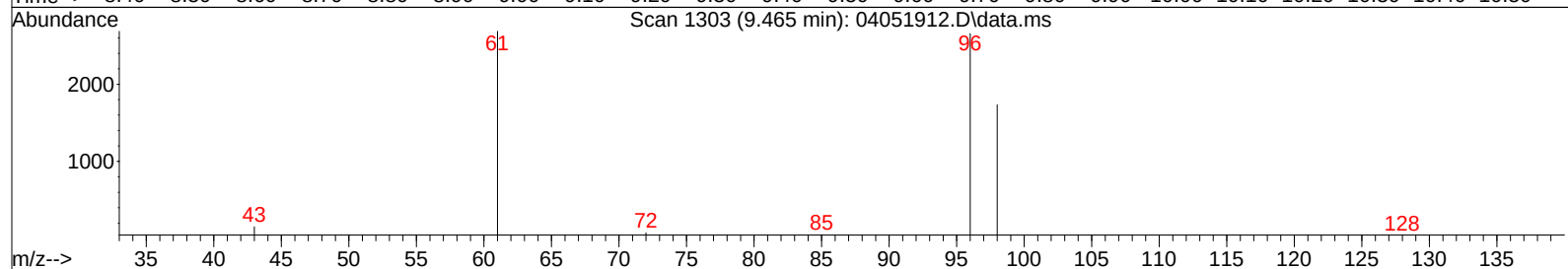
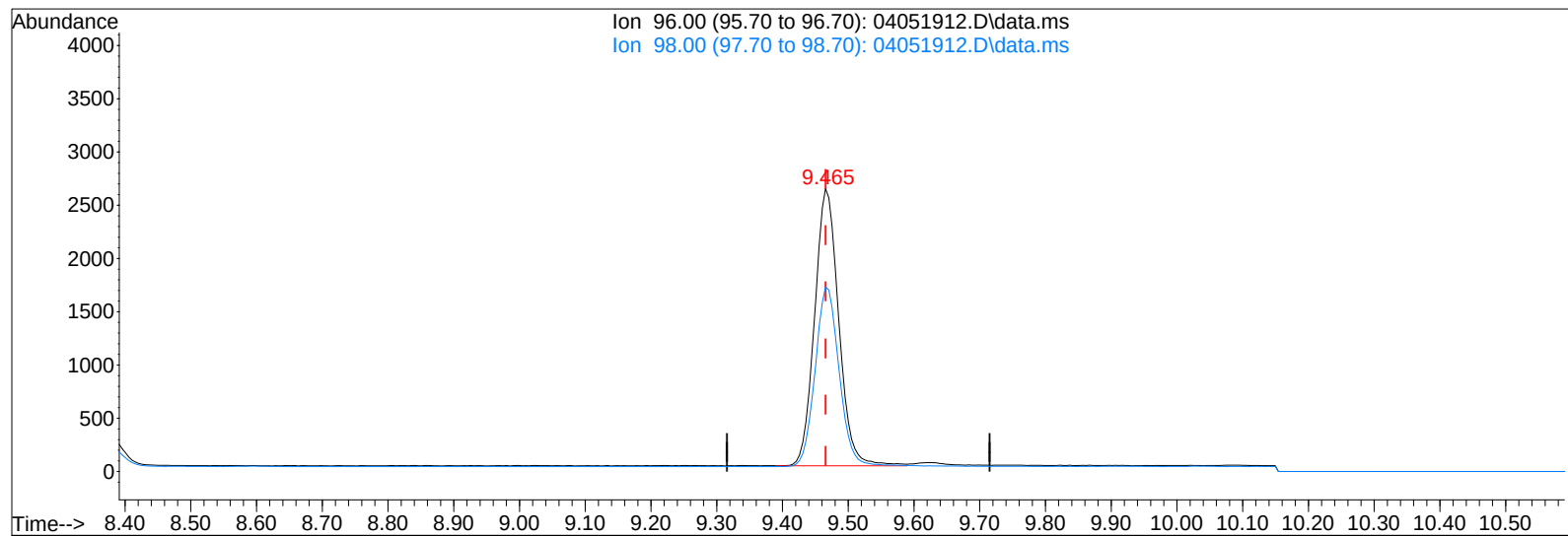
Quant Time: Apr 09 10:25:02 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051912.D
Acq On : 5 Apr 2019 12:37
Sample : P1901824-004 (1000mL)
Misc : S31-03161901

Vial: 5
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:40 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051912.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.465min (-0.000) 230.20pg

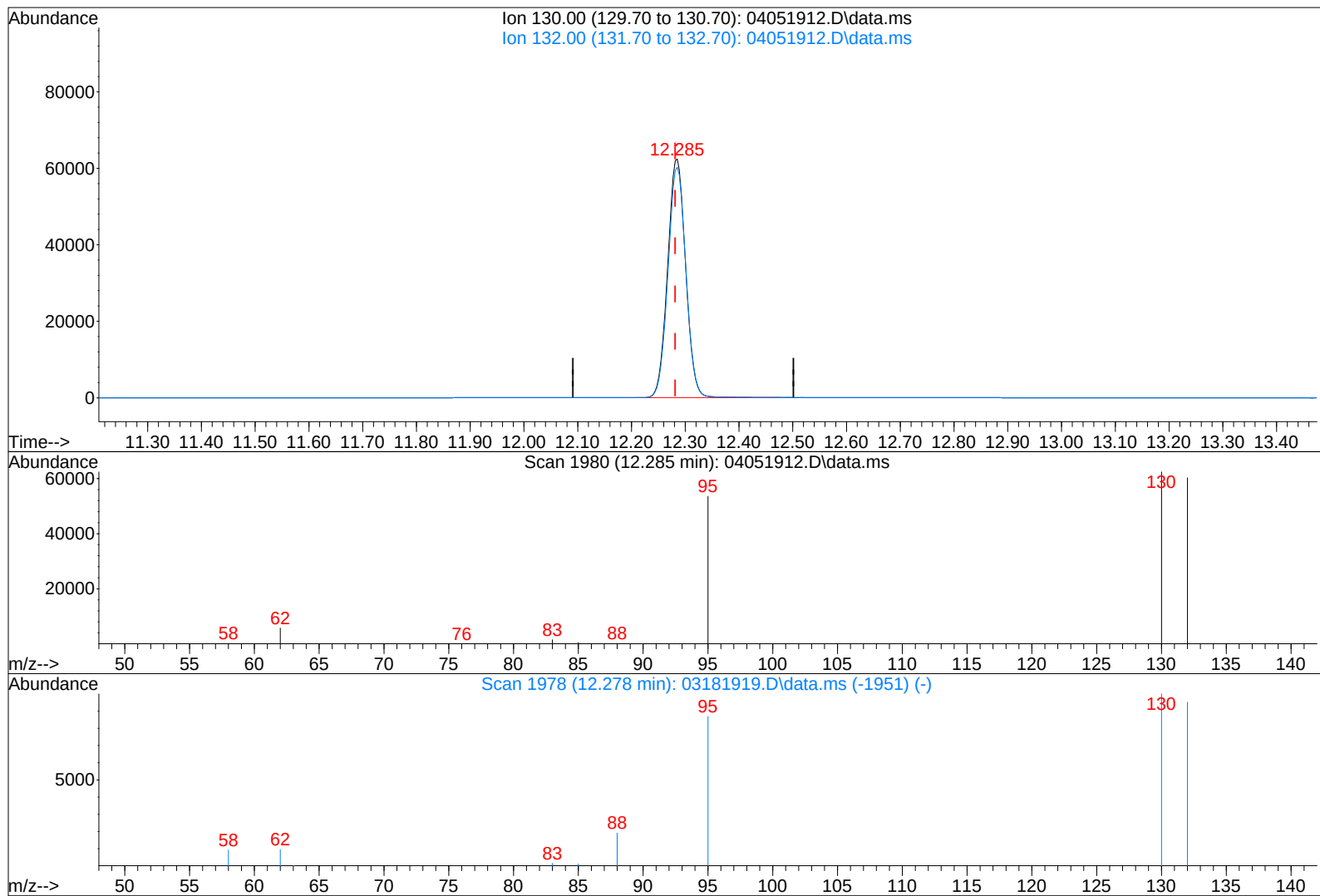
response 6634

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	64.95
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051912.D
Acq On : 5 Apr 2019 12:37
Sample : P1901824-004 (1000mL)
Misc : S31-03161901

Vial: 5
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:40 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051912.D\data.ms

(28) Trichloroethene (T)

12.285min (+0.004) 4481.88pg

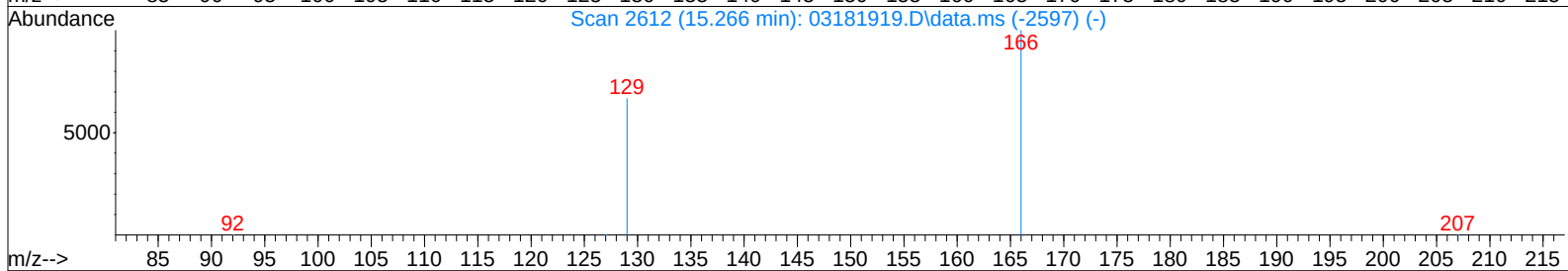
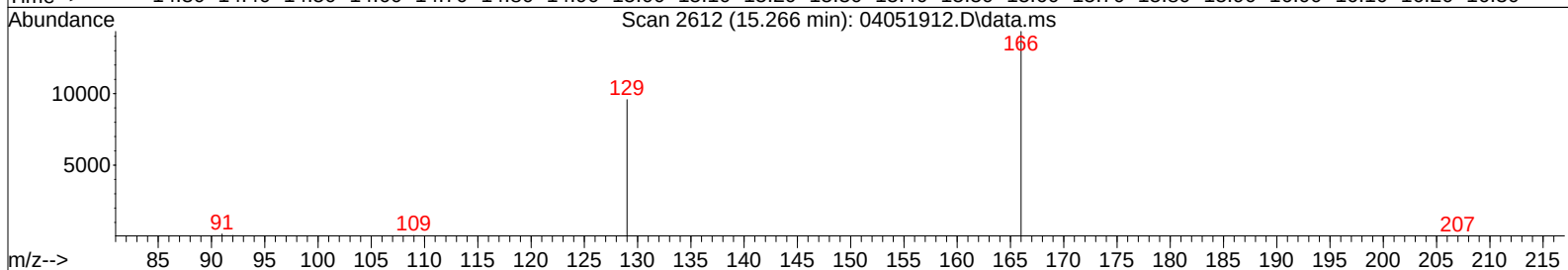
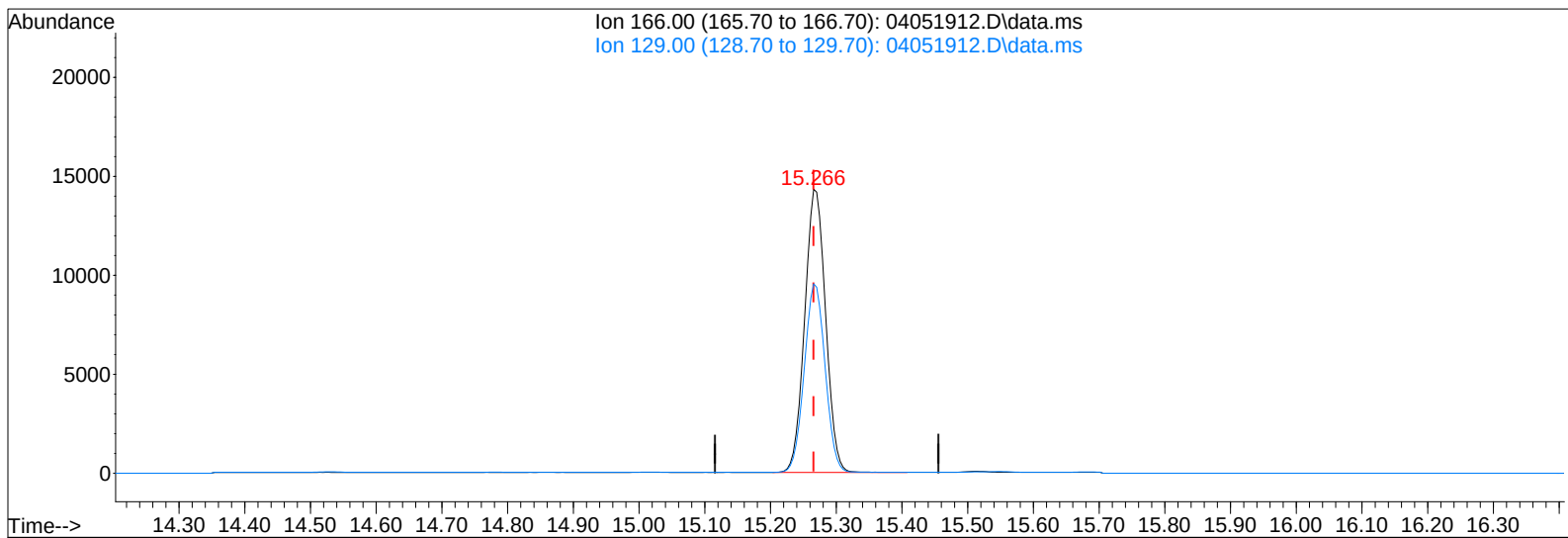
response 144995

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.44
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051912.D
Acq On : 5 Apr 2019 12:37
Sample : P1901824-004 (1000mL)
Misc : S31-03161901

Vial: 5
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:07:40 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051912.D\data.ms

(37) Tetrachloroethene (T)

15.266min (-0.000) 909.14pg

response 31621

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.46
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-4
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-005

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02460

Date Collected: 4/2/19

Date Received: 4/4/19

Date Analyzed: 4/5/19

Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.79 Final Pressure (psig): 3.79

Container Dilution Factor: 1.43

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.016	0.16	0.013	0.0041	0.040	0.0033	J
79-01-6	Trichloroethene	0.29	0.16	0.012	0.053	0.029	0.0023	
127-18-4	Tetrachloroethene	0.30	0.16	0.012	0.044	0.023	0.0017	

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.

Data File : I:\MS19\DATA\2019 04\05\04051913.D
 Acq On : 5 Apr 2019 13:09
 Sample : P1901824-005 (1000mL)
 Misc : S31-03161901

Vial: 6
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:27:38 2019

TD 4/9/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.64	130	23008	1000.000	pg	0.02
25) 1,4-Difluorobenzene (IS2)	11.59	114	103695	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	14128	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.42	65	23900	891.172	pg	0.02
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	89.12%
33) Toluene-d8 (SS2)	14.02	98	109244	1013.761	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	101.38%
45) Bromofluorobenzene (SS3)	17.43	174	55921	1040.572	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	104.06%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	70279	1474.998	pg	100
3) Chloromethane	4.52	52	2656	253.303	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	2004	58.474	pg	99
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	0.00	54	0	N.D.	d	
7) Bromomethane	5.33	94	342	15.999	pg	98
8) Chloroethane	5.56	64	131	8.642	pg	# 42
9) Acrolein	6.16	56	3065	264.081	pg	100
10) Acetone	6.29	58	905427	53660.764	pg	# 1
11) Trichlorofluoromethane	6.49	101	27451	751.636	pg	100
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.38	84	7667	283.737	pg	# 71
14) Trichlorotrifluoroethane	7.68	151	6805	277.717	pg	100
15) trans-1,2-Dichloroethene	8.40	96	123	N.D.		
16) 1,1-Dichloroethane	0.00	63	0	N.D.	d	
17) Methyl tert-Butyl Ether	0.00	73	0	N.D.	d	
18) cis-1,2-Dichloroethene	9.49	96	338	11.405	pg	100
19) Chloroform	9.78	83	3191	69.450	pg	# 61
21) 1,2-Dichloroethane	10.54	62	2685	99.248	pg	94
22) 1,1,1-Trichloroethane	10.79	97	561	14.667	pg	93
23) Benzene	11.25	78	633532	5574.576	pg	100
24) Carbon Tetrachloride	11.40	117	8654	240.261	pg	100
26) 1,2-Dichloropropane	12.05	63	340	14.348	pg	100
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.29	130	6580	200.369	pg	99
29) 1,4-Dioxane	12.28	88	152	N.D.		
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.12	91	10493500	91738.056	pg	96
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	7300	206.765	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	1486136	11362.720	pg	99
41) m,p-Xylene	16.52	91	4231855	43072.791	pg	98
42) Styrene	16.88	104	9772	133.003	pg	94
43) o-Xylene	17.00	106	887699	17063.072	pg	98
44) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	d	
46) 1,3,5-Trimethylbenzene	18.27	105	2301101	20277.311	pg	98
47) 1,2,4-Trimethylbenzene	18.66	105	6374899	57645.954	pg	91
48) 1,3-Dichlorobenzene	18.81	146	110	N.D.		
49) 1,4-Dichlorobenzene	18.87	146	4230	56.437	pg	100
50) 1,2-Dichlorobenzene	19.20	146	98	N.D.		
51) 1,2-Dibromo-3-chloropr...	19.64	157	124	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	123	N.D.		
53) Naphthalene	20.93	128	108760	734.804	pg	92

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Data File : I:\MS19\DATA\2019 04\05\04051913.D
Acq On : 5 Apr 2019 13:09
Sample : P1901824-005 (1000mL)
Misc : S31-03161901

Vial: 6
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:27:38 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

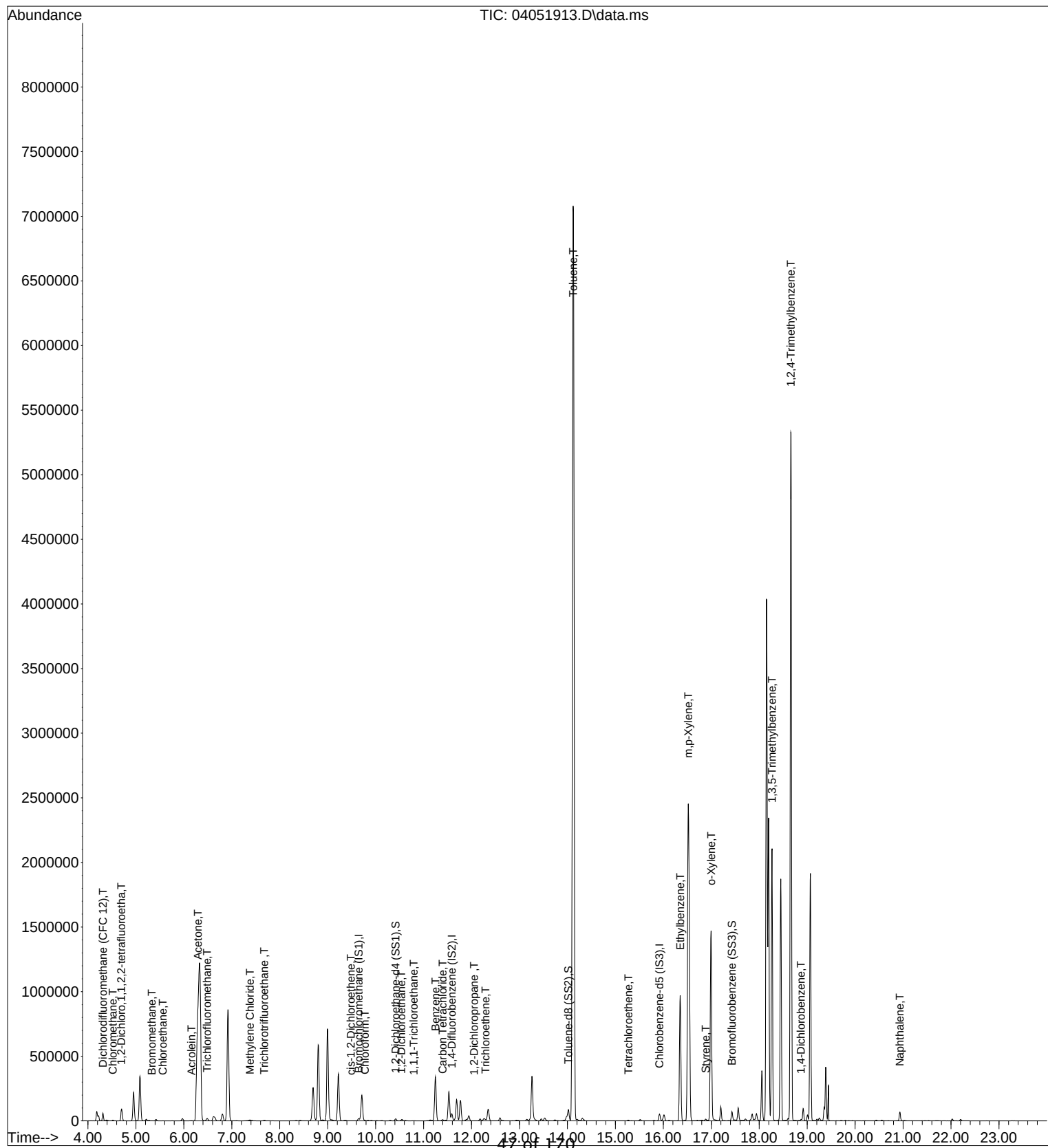
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	68	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051913.D
Acq On : 5 Apr 2019 13:09
Sample : P1901824-005 (1000mL)
Misc : S31-03161901

Vial: 6
Operator: TD
Inst : MS19

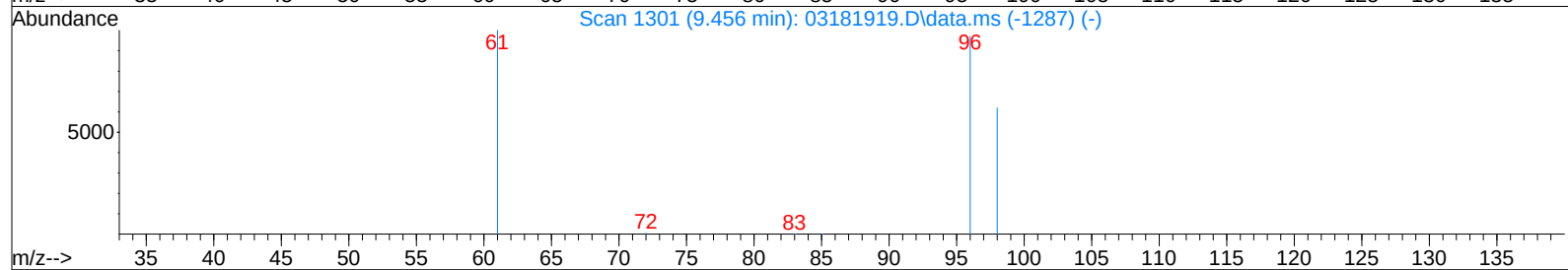
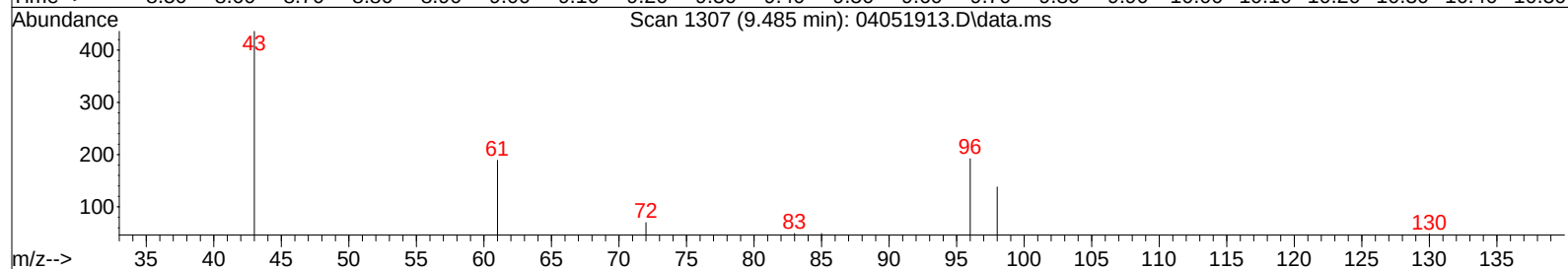
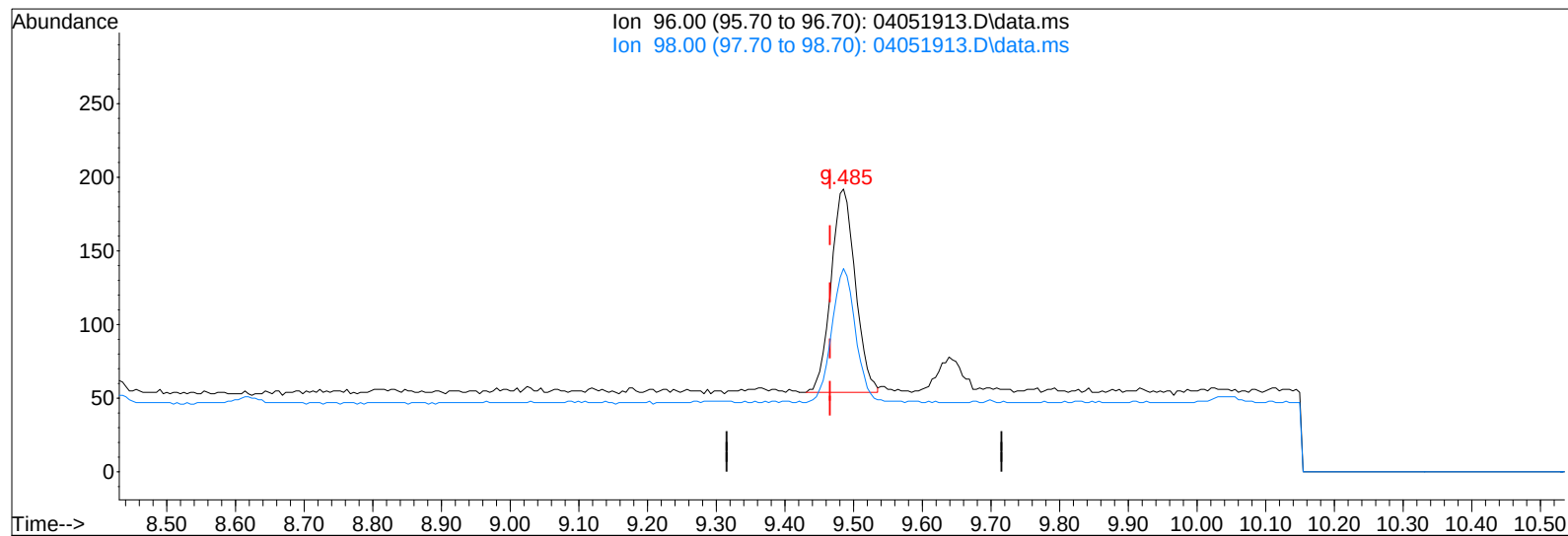
Quant Time: Apr 09 10:27:38 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051913.D
Acq On : 5 Apr 2019 13:09
Sample : P1901824-005 (1000mL)
Misc : S31-03161901

Vial: 6
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:21 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051913.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.485min (+0.020) 11.40pg

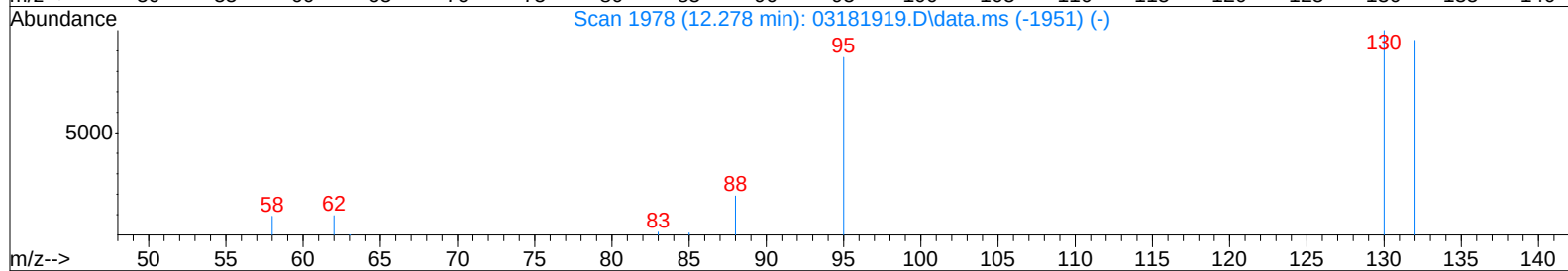
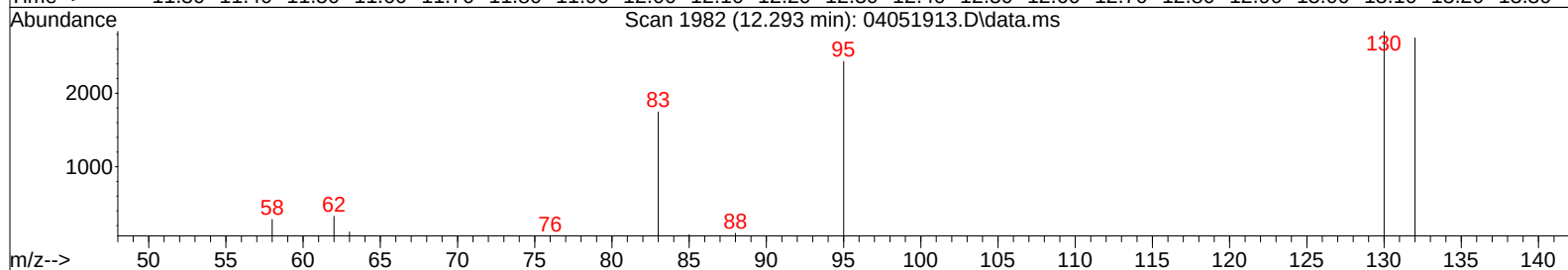
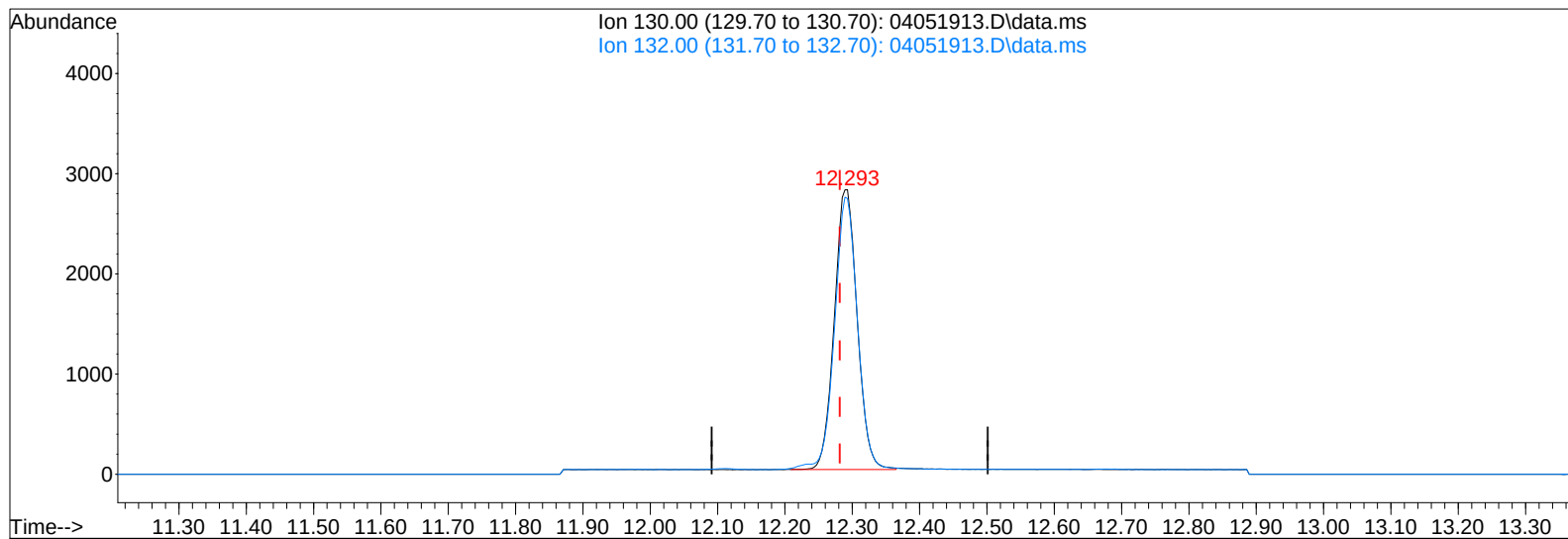
response 338

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	64.50
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051913.D
Acq On : 5 Apr 2019 13:09
Sample : P1901824-005 (1000mL)
Misc : S31-03161901

Vial: 6
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:21 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051913.D\data.ms

(28) Trichloroethene (T)

12.293min (+0.011) 200.37pg

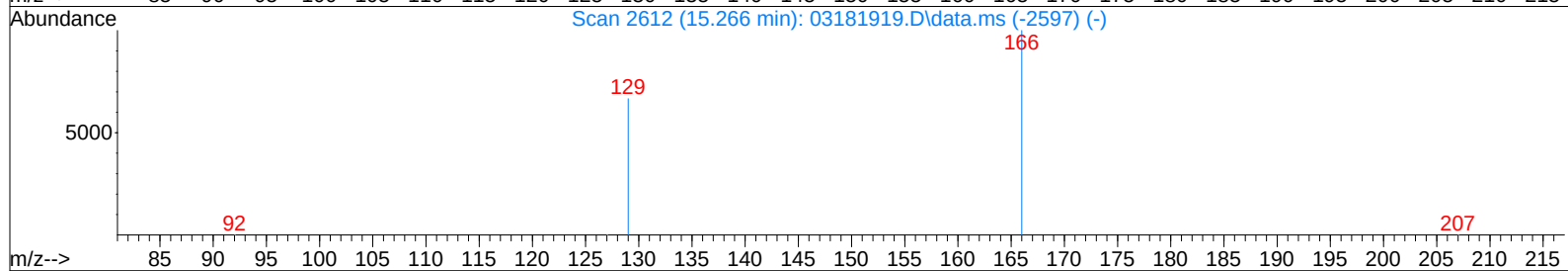
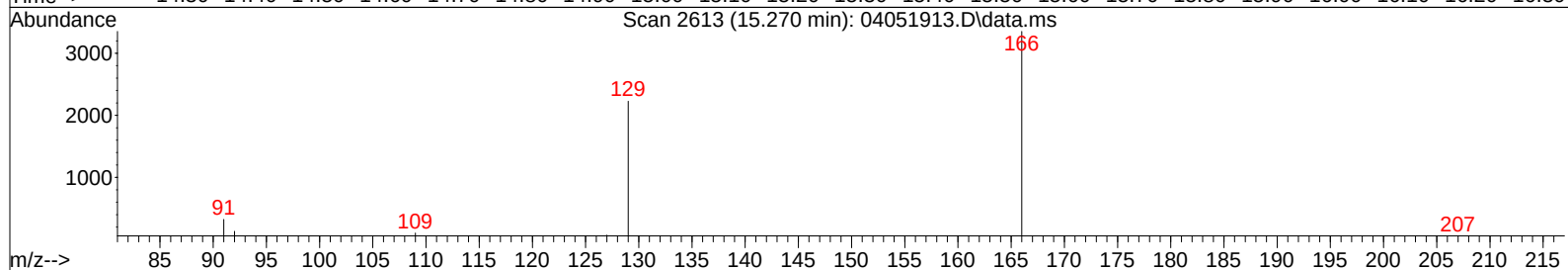
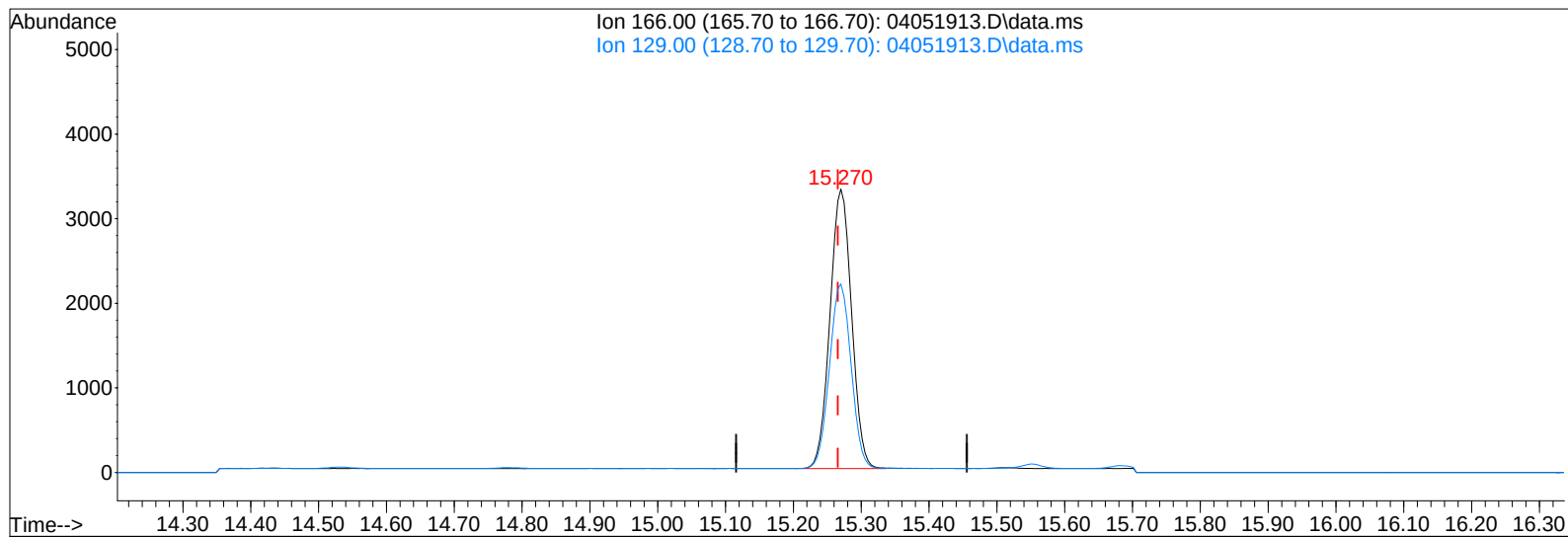
response 6580

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.82
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051913.D
Acq On : 5 Apr 2019 13:09
Sample : P1901824-005 (1000mL)
Misc : S31-03161901

Vial: 6
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:21 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051913.D\data.ms

(37) Tetrachloroethene (T)

15.270min (+0.004) 206.76pg

response 7300

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.33
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-5
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-006

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: SC00904

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.74 Final Pressure (psig): 3.70

Container Dilution Factor: 1.54

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.25	0.17	0.014	0.064	0.043	0.0036	
79-01-6	Trichloroethene	4.6	0.17	0.013	0.85	0.032	0.0024	
127-18-4	Tetrachloroethene	0.73	0.17	0.013	0.11	0.025	0.0019	

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.

Data File : I:\MS19\DATA\2019 04\05\04051914.D
 Acq On : 5 Apr 2019 13:40
 Sample : P1901824-006 (1000mL)
 Misc : S31-03161901

Vial: 7
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:28:48 2019

TD 4/9/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21821	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	98374	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12451	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	22872	899.233	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	89.92%
33) Toluene-d8 (SS2)	14.02	98	105347	1030.476	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	103.05%
45) Bromofluorobenzene (SS3)	17.43	174	53009	1119.241	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	111.92%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	62377	1380.367	pg	100
3) Chloromethane	4.53	52	2381	239.428	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	1935	59.532	pg	100
5) Vinyl Chloride	4.82	62	178	N.D.		
6) 1,3-Butadiene	0.00	54	0	N.D.	d	
7) Bromomethane	5.33	94	295	14.551	pg	99
8) Chloroethane	5.56	64	139	9.669	pg	# 42
9) Acrolein	6.13	56	4490	407.904	pg	99
10) Acetone	6.27	58	138404	8648.808	pg	# 73
11) Trichlorofluoromethane	6.47	101	25155	726.236	pg	100
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.34	84	30511	1190.559	pg	91
14) Trichlorotrifluoroethane	7.67	151	6166	265.328	pg	100
15) trans-1,2-Dichloroethene	8.38	96	448	16.952	pg	100
16) 1,1-Dichloroethane	8.59	63	112	N.D.		
17) Methyl tert-Butyl Ether	8.68	73	281	N.D.		
18) cis-1,2-Dichloroethene	9.46	96	4605	163.830	pg	99
19) Chloroform	9.76	83	4132	94.822	pg	98
21) 1,2-Dichloroethane	10.51	62	3343	130.293	pg	99
22) 1,1,1-Trichloroethane	10.78	97	802	22.108	pg	100
23) Benzene	11.23	78	72929	676.625	pg	99
24) Carbon Tetrachloride	11.39	117	7788	227.980	pg	100
26) 1,2-Dichloropropane	12.05	63	336	14.946	pg	98
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	92328	2963.571	pg	99
29) 1,4-Dioxane	12.27	88	1269	58.328	pg	90
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	13.61	75	57	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.	d	
34) Toluene	14.11	91	849284	7826.356	pg	99
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	15898	474.650	pg	100
39) Chlorobenzene	0.00	112	0	N.D.	d	
40) Ethylbenzene	16.35	91	187888	1630.044	pg	99
41) m,p-Xylene	16.52	91	469245	5419.364	pg	100
42) Styrene	16.89	104	9725	150.192	pg	96
43) o-Xylene	16.99	106	88121	1921.973	pg	99
44) 1,1,2,2-Tetrachloroethane	17.00	83	200	N.D.		
46) 1,3,5-Trimethylbenzene	18.26	105	99408	993.968	pg	100
47) 1,2,4-Trimethylbenzene	18.65	105	317043	3253.046	pg	89
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
49) 1,4-Dichlorobenzene	18.87	146	38296	579.769	pg	100
50) 1,2-Dichlorobenzene	19.20	146	134	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	102	N.D.		
53) Naphthalene	20.94	128	24421	187.216	pg	100

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Data File : I:\MS19\DATA\2019 04\05\04051914.D
Acq On : 5 Apr 2019 13:40
Sample : P1901824-006 (1000mL)
Misc : S31-03161901

Vial: 7
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:28:48 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

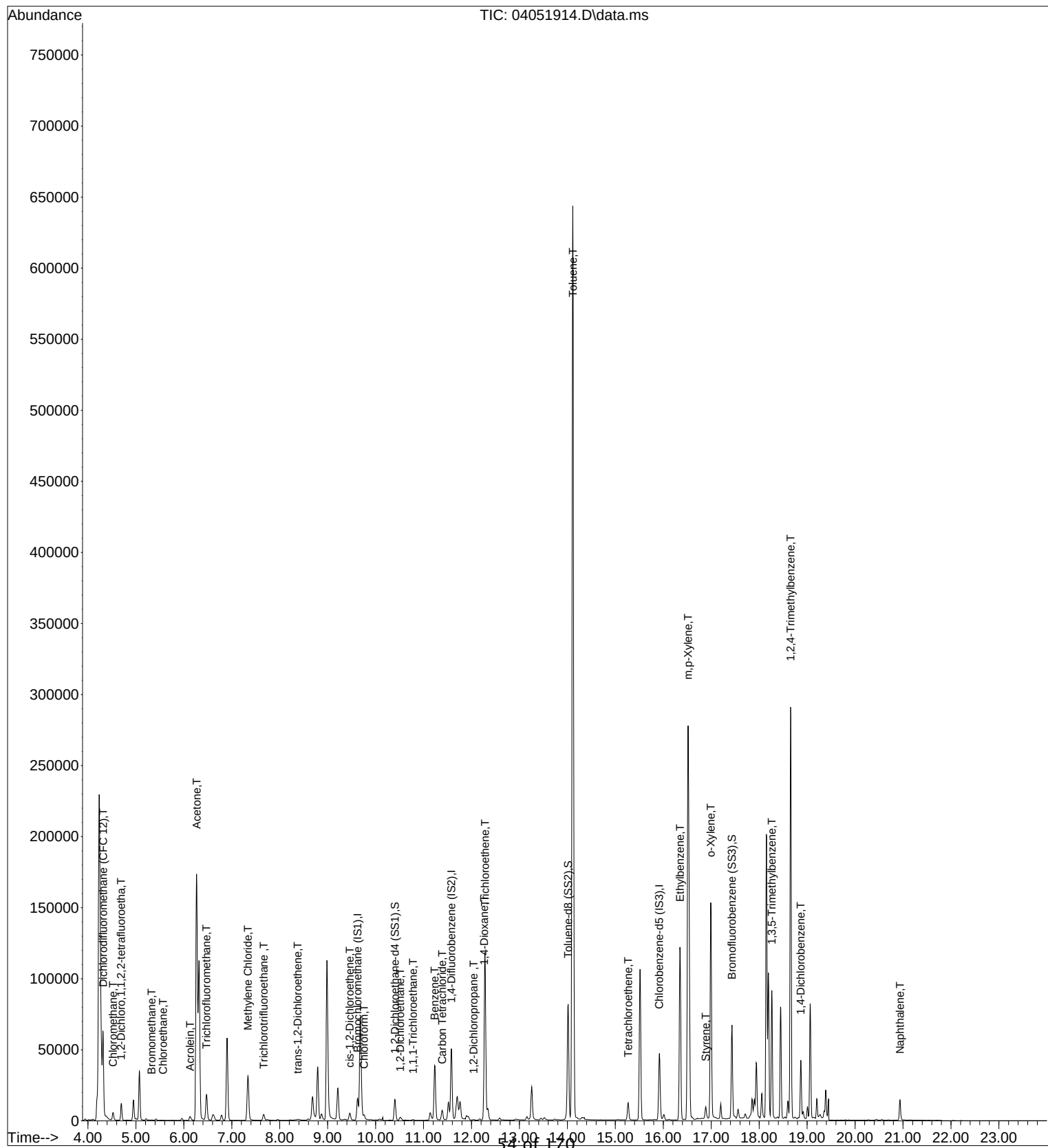
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	0.00	225	0	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051914.D
Acq On : 5 Apr 2019 13:40
Sample : P1901824-006 (1000mL)
Misc : S31-03161901

Vial: 7
Operator: TD
Inst : MS19

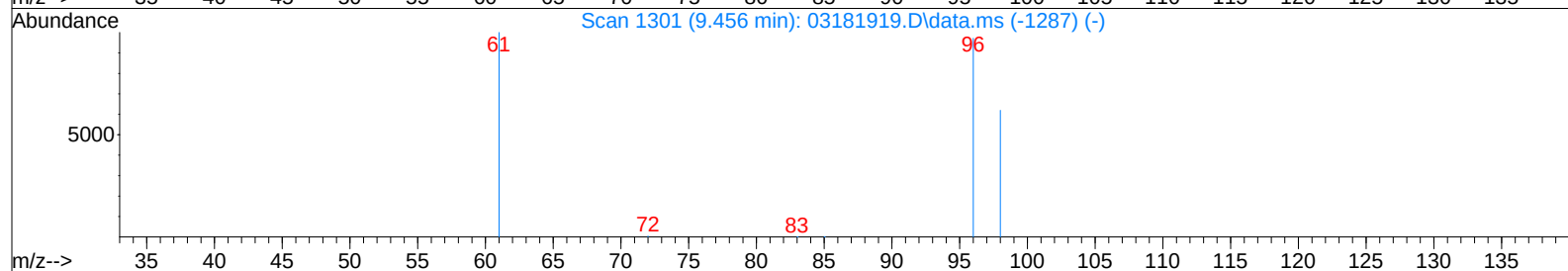
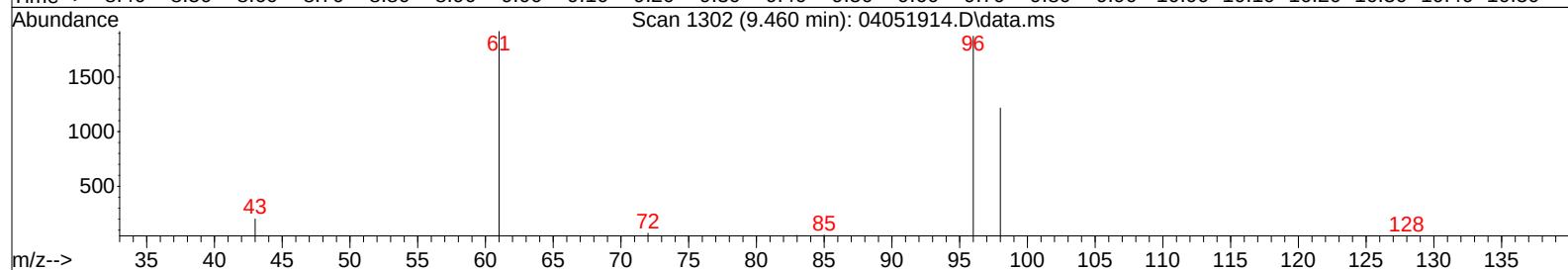
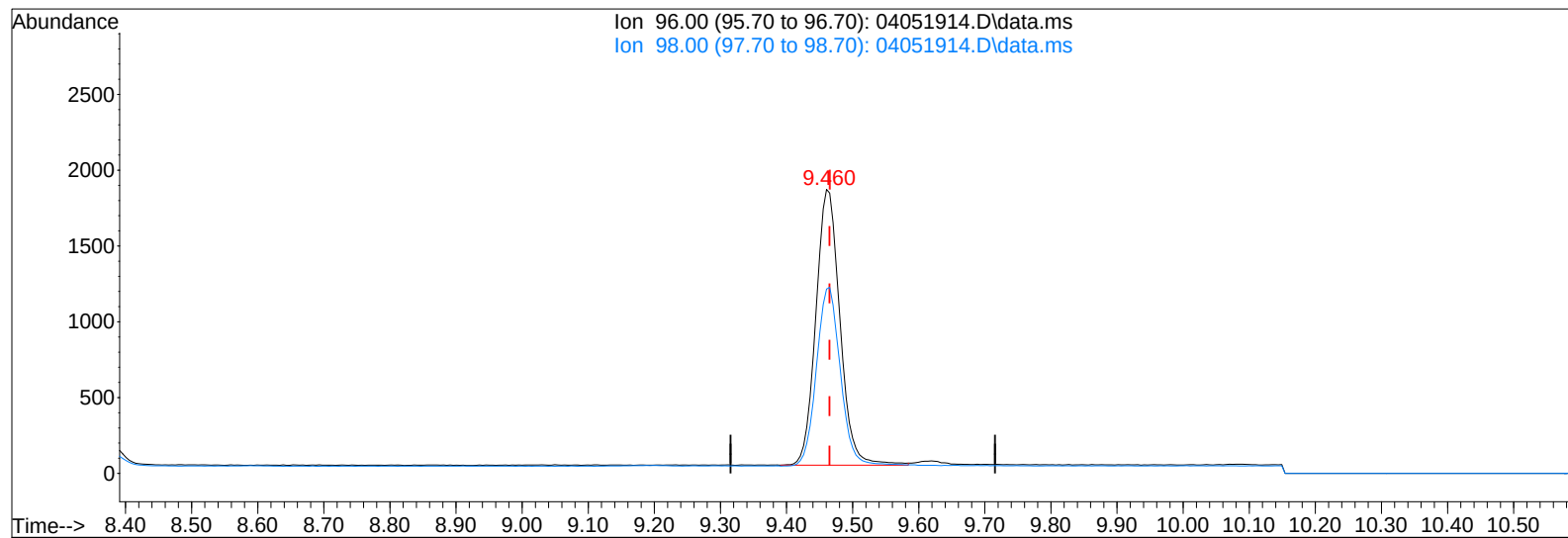
Quant Time: Apr 09 10:28:48 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051914.D
Acq On : 5 Apr 2019 13:40
Sample : P1901824-006 (1000mL)
Misc : S31-03161901

Vial: 7
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:50 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051914.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.460min (-0.005) 163.83pg

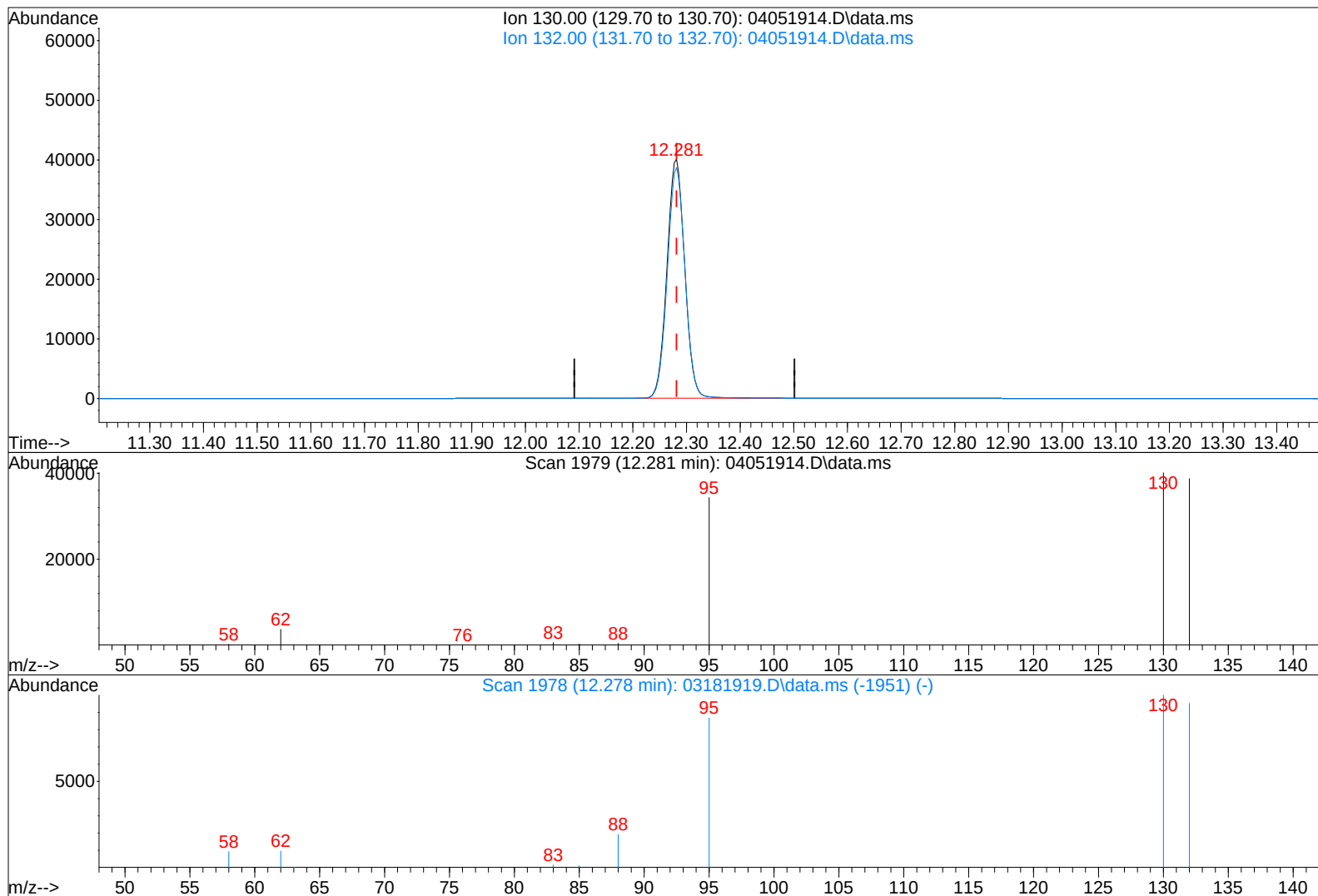
response 4605

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	65.15
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051914.D
Acq On : 5 Apr 2019 13:40
Sample : P1901824-006 (1000mL)
Misc : S31-03161901

Vial: 7
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:50 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051914.D\data.ms

(28) Trichloroethene (T)

12.281min (-0.000) 2963.57pg

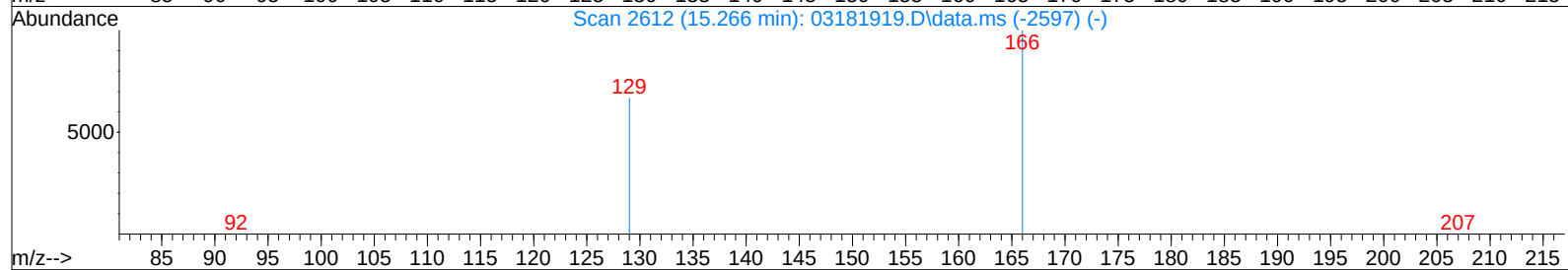
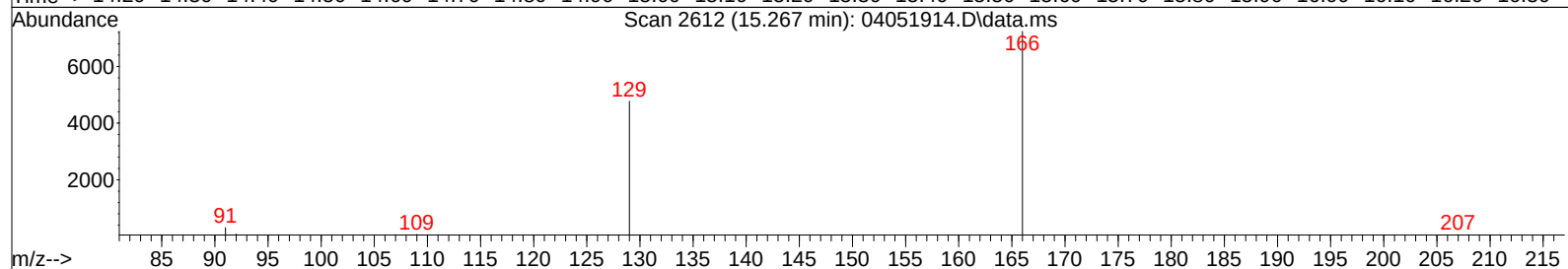
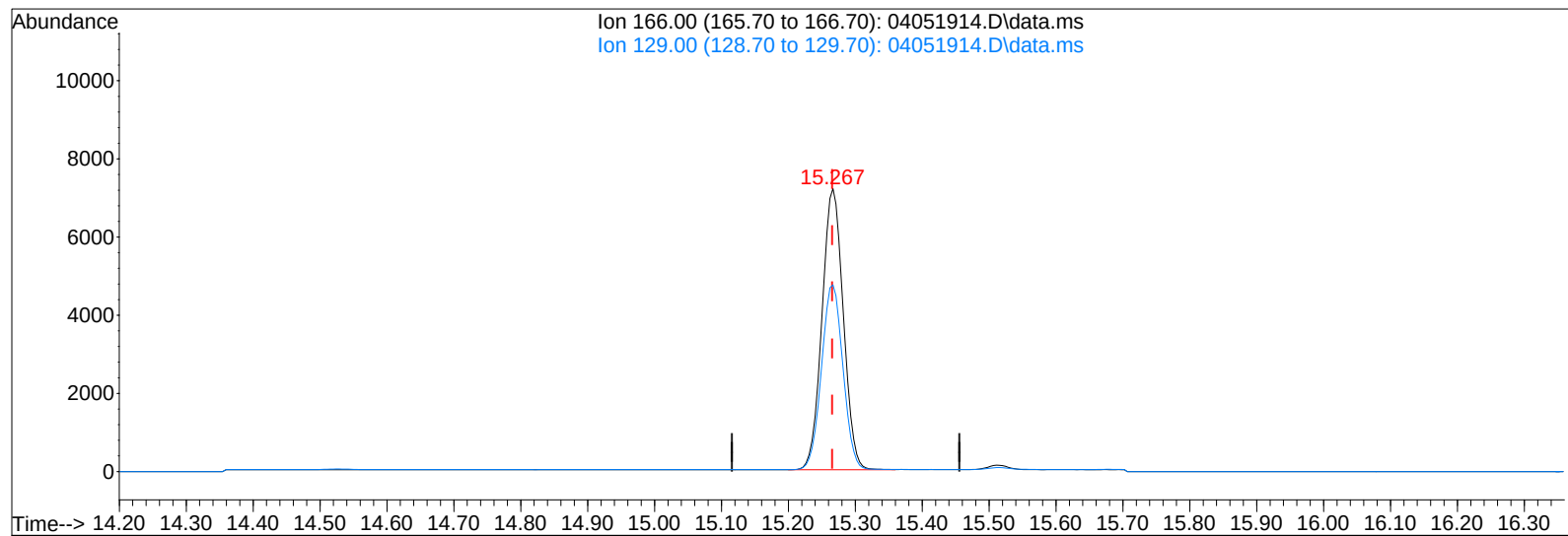
response 92328

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.27
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051914.D
Acq On : 5 Apr 2019 13:40
Sample : P1901824-006 (1000mL)
Misc : S31-03161901

Vial: 7
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:40:50 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051914.D\data.ms

(37) Tetrachloroethene (T)

15.267min (+0.001) 474.65pg

response 15898

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.32
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK IA F040219-6
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-007

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02458

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -1.73 Final Pressure (psig): 3.73

Container Dilution Factor: 1.42

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	0.029	0.16	0.013	0.0073	0.039	0.0033	J
79-01-6	Trichloroethene	1.6	0.16	0.012	0.29	0.029	0.0022	
127-18-4	Tetrachloroethene	0.23	0.16	0.012	0.034	0.023	0.0017	

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.

Data File : I:\MS19\DATA\2019 04\05\04051915.D
 Acq On : 5 Apr 2019 14:12
 Sample : P1901824-007 (1000mL)
 Misc : S31-03161901

Vial: 8
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:29:56 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/9/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21119	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	95232	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12047	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	22527	915.109	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	91.51%
33) Toluene-d8 (SS2)	14.02	98	101758	1028.209	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	102.82%
45) Bromofluorobenzene (SS3)	17.43	174	50789	1108.329	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	110.83%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	65314	1493.405	pg	100
3) Chloromethane	4.53	52	2575	267.543	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.71	85	2042	64.912	pg	100
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	5.03	54	401	19.810	pg	# 28
7) Bromomethane	5.35	94	334	17.023	pg	100
8) Chloroethane	5.57	64	104	N.D.		
9) Acrolein	6.14	56	2122	199.186	pg	99
10) Acetone	6.27	58	44389	2866.053	pg	# 84
11) Trichlorofluoromethane	6.48	101	25283	754.195	pg	100
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.34	84	7351	296.376	pg	90
14) Trichlorotrifluoroethane	7.67	151	6584	292.732	pg	100
15) trans-1,2-Dichloroethene	8.38	96	129	N.D.		
16) 1,1-Dichloroethane	8.58	63	160	N.D.		
17) Methyl tert-Butyl Ether	8.69	73	145	N.D.		
18) cis-1,2-Dichloroethene	9.47	96	552	20.291	pg	99
19) Chloroform	9.76	83	2474	58.661	pg	98
21) 1,2-Dichloroethane	10.51	62	1299	52.311	pg	95
22) 1,1,1-Trichloroethane	10.78	97	309	8.801	pg	99
23) Benzene	11.23	78	36533	350.215	pg	100
24) Carbon Tetrachloride	11.39	117	8122	245.660	pg	100
26) 1,2-Dichloropropane	12.04	63	279	12.820	pg	99
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	33061	1096.214	pg	99
29) 1,4-Dioxane	12.28	88	123	N.D.		
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	13.61	75	55	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.		
34) Toluene	14.11	91	133531	1271.119	pg	100
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	5197	160.281	pg	100
39) Chlorobenzene	15.91	112	127	N.D.		
40) Ethylbenzene	16.35	91	24016	215.341	pg	99
41) m,p-Xylene	16.52	91	53724	641.272	pg	100
42) Styrene	16.89	104	1131	18.053	pg	# 86
43) o-Xylene	17.00	106	11295	254.612	pg	100
44) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	d	
46) 1,3,5-Trimethylbenzene	18.26	105	11591	119.784	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	32047	339.848	pg	88
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
49) 1,4-Dichlorobenzene	18.87	146	1428	22.344	pg	99
50) 1,2-Dichlorobenzene	19.20	146	118	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	0.00	182	0	N.D.		
53) Naphthalene	20.94	128	2855	22.621	pg	99

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Data File : I:\MS19\DATA\2019 04\05\04051915.D
Acq On : 5 Apr 2019 14:12
Sample : P1901824-007 (1000mL)
Misc : S31-03161901

Vial: 8
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:29:56 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

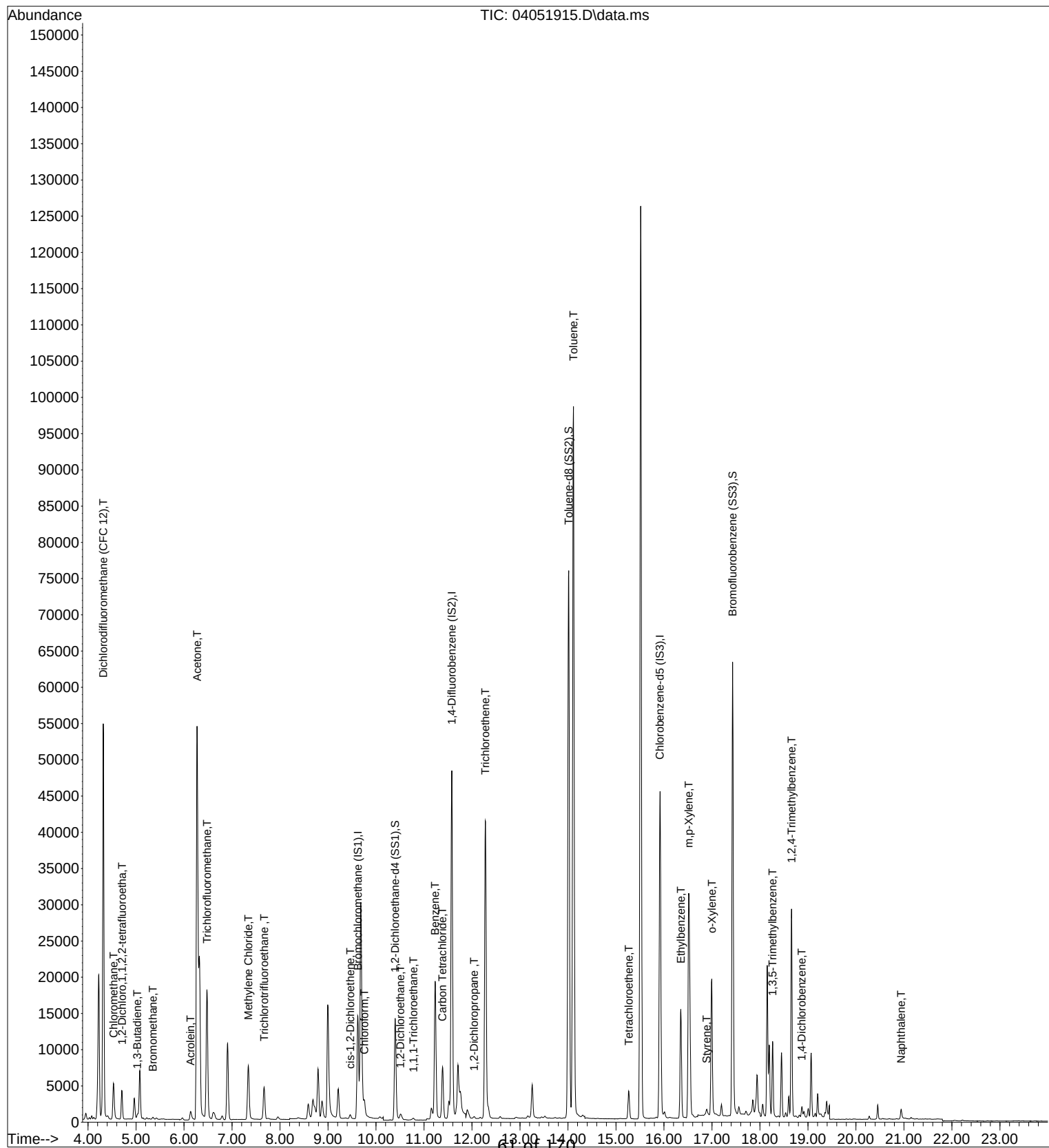
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	50	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051915.D
Acq On : 5 Apr 2019 14:12
Sample : P1901824-007 (1000mL)
Misc : S31-03161901

Vial: 8
Operator: TD
Inst : MS19

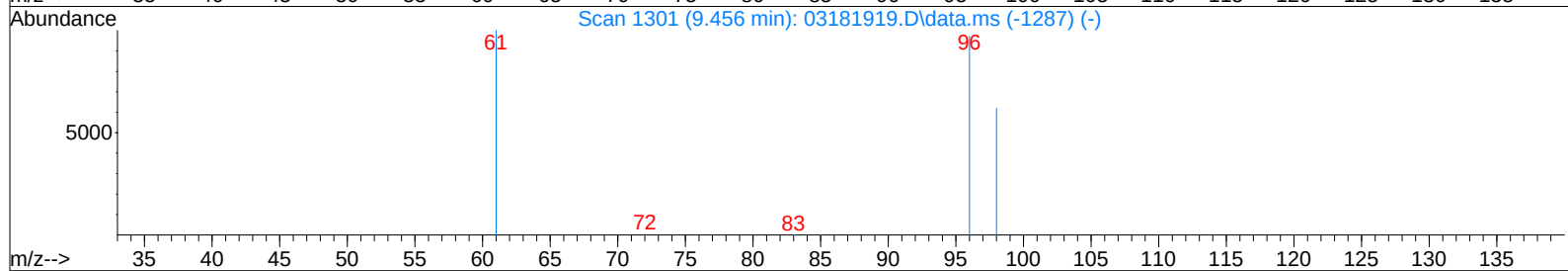
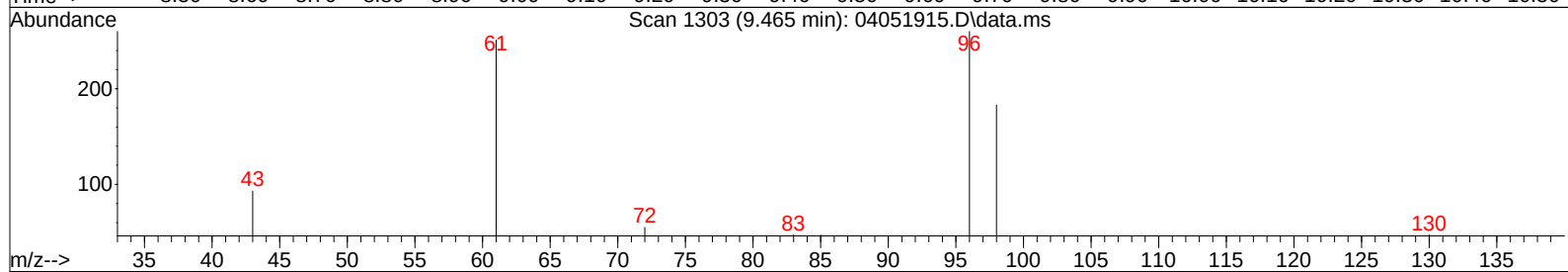
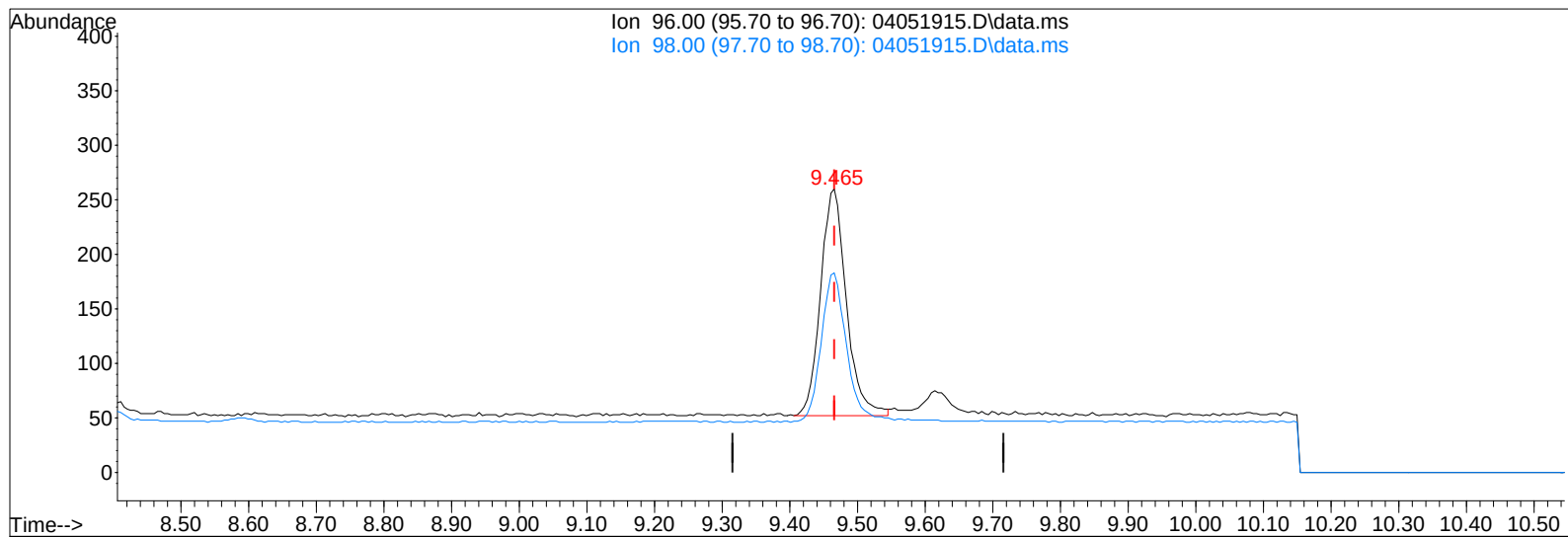
Quant Time: Apr 09 10:29:56 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051915.D
Acq On : 5 Apr 2019 14:12
Sample : P1901824-007 (1000mL)
Misc : S31-03161901

Vial: 8
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:41:18 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051915.D\data.ms

(18) cis-1,2-Dichloroethene (T)

9.465min (-0.000) 20.29pg

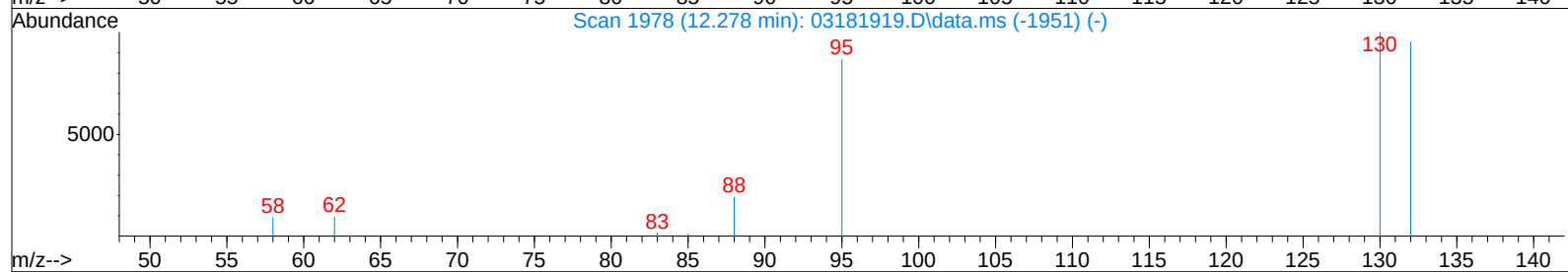
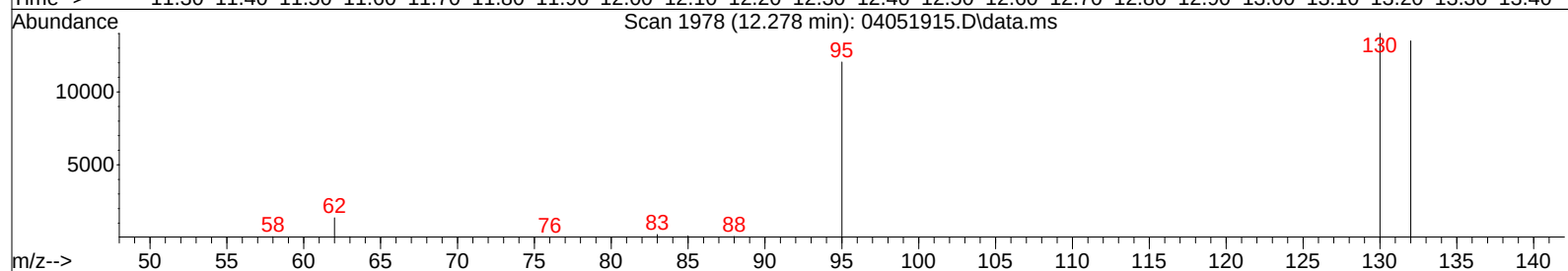
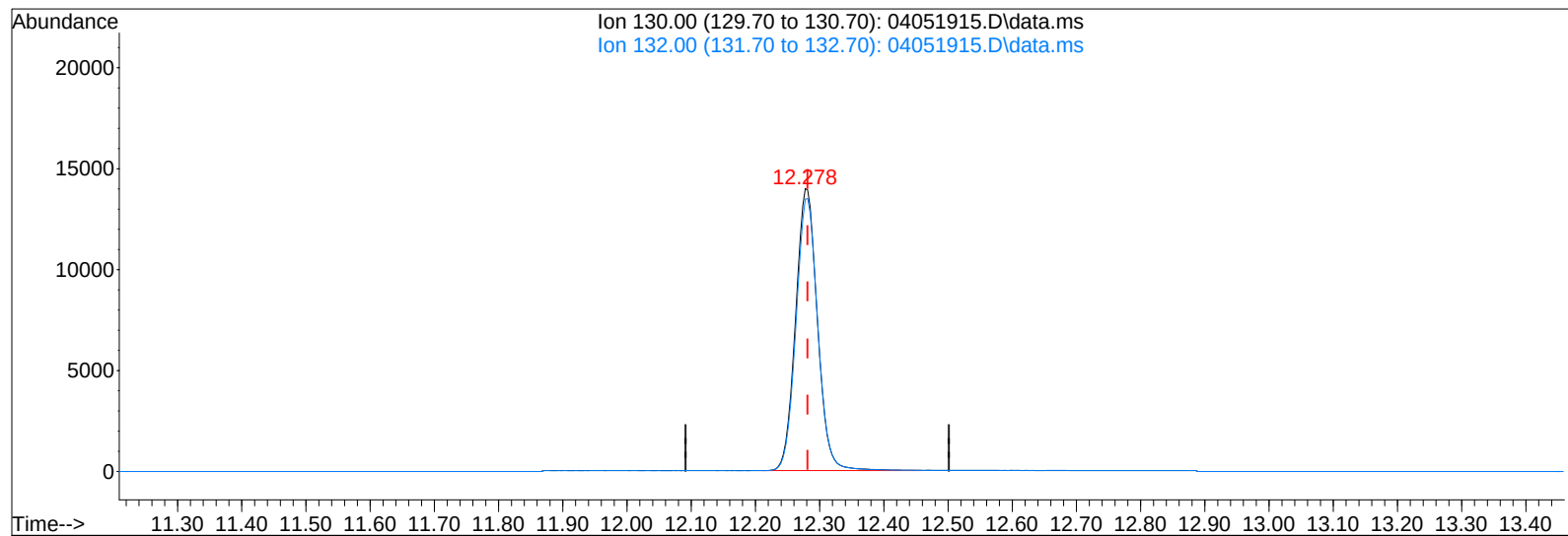
response 552

Ion	Exp%	Act%
96.00	100	100
98.00	64.50	65.22
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051915.D
Acq On : 5 Apr 2019 14:12
Sample : P1901824-007 (1000mL)
Misc : S31-03161901

Vial: 8
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:41:18 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051915.D\data.ms

(28) Trichloroethene (T)

12.278min (-0.004) 1096.21pg

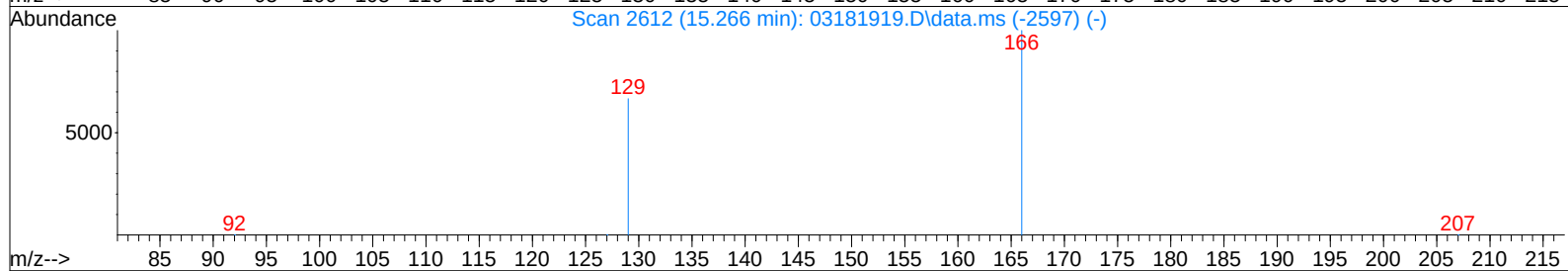
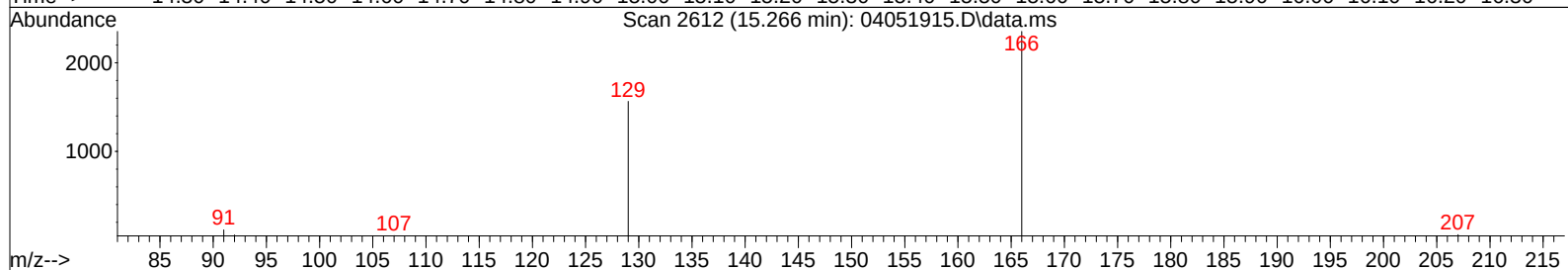
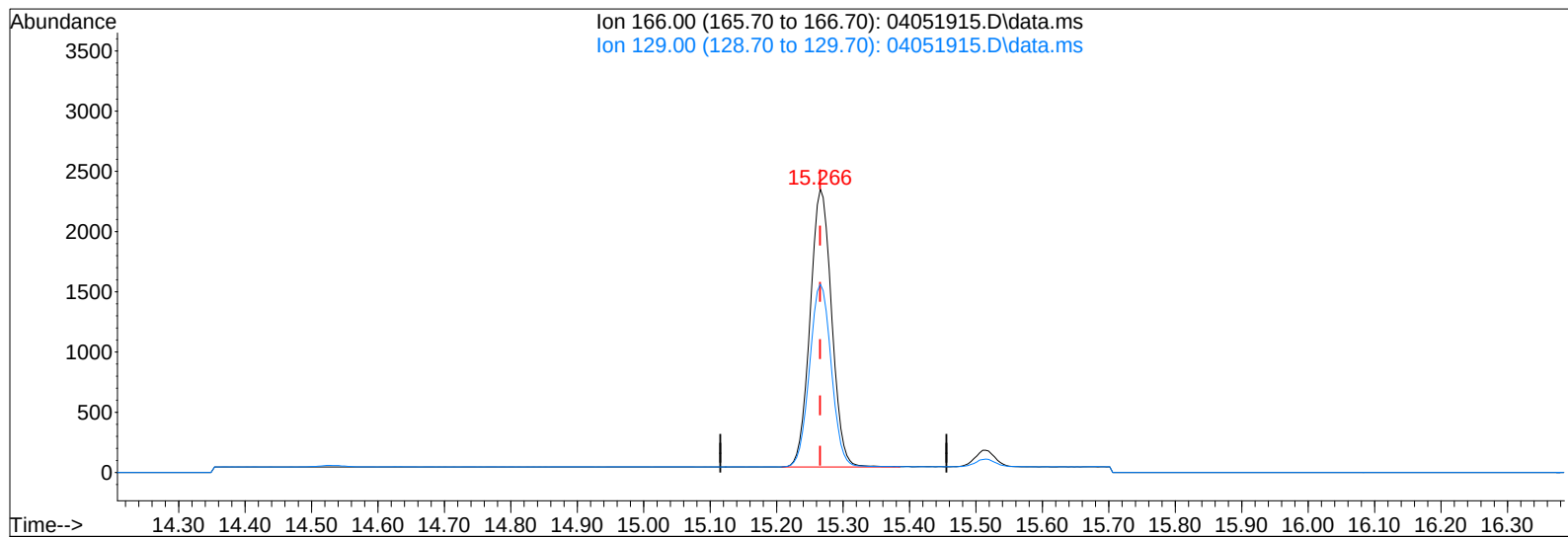
response 33061

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.43
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051915.D
Acq On : 5 Apr 2019 14:12
Sample : P1901824-007 (1000mL)
Misc : S31-03161901

Vial: 8
Operator: TD
Inst : MS19

Quant Time: Apr 05 14:41:18 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051915.D\data.ms

(37) Tetrachloroethene (T)

15.266min (0.000) 160.28pg

response 5197

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.35
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK AA F040219-1
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-008

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02416

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.16 Final Pressure (psig): 3.91

Container Dilution Factor: 1.48

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.16	0.014	ND	0.041	0.0034	
79-01-6	Trichloroethene	0.019	0.16	0.013	0.0035	0.030	0.0023	J
127-18-4	Tetrachloroethene	0.078	0.16	0.012	0.011	0.024	0.0018	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.

Data File : I:\MS19\DATA\2019 04\05\04051916.D
 Acq On : 5 Apr 2019 14:44
 Sample : P1901824-008 (1000mL)
 Misc : S31-03161901

Vial: 9
 Operator: TD
 Inst : MS19

Quant Time: Apr 06 10:57:54 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/9/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	20384	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	91507	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	11645	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	21020	884.680	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	88.47%
33) Toluene-d8 (SS2)	14.01	98	97809	1028.538	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	102.85%
45) Bromofluorobenzene (SS3)	17.43	174	49268	1112.253	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	111.22%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	61735	1462.470	pg	100
3) Chloromethane	4.53	52	2514	270.624	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.71	85	1900	62.576	pg	100
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	5.03	54	208	10.646	pg	# 25
7) Bromomethane	5.35	94	299	15.788	pg	99
8) Chloroethane	5.57	64	102	N.D.		
9) Acrolein	6.14	56	1090	106.004	pg	98
10) Acetone	6.28	58	31081	2079.160	pg	99
11) Trichlorofluoromethane	6.48	101	23446	724.615	pg	100
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.34	84	4286	179.033	pg	89
14) Trichlorotrifluoroethane	7.67	151	5841	269.062	pg	100
15) trans-1,2-Dichloroethene	8.38	96	61	N.D.		
16) 1,1-Dichloroethane	8.59	63	88	N.D.		
17) Methyl tert-Butyl Ether	8.69	73	97	N.D.		
18) cis-1,2-Dichloroethene	9.46	96	50	N.D.		
19) Chloroform	9.76	83	1957	48.076	pg	98
21) 1,2-Dichloroethane	10.51	62	1107	46.187	pg	97
22) 1,1,1-Trichloroethane	10.78	97	164	N.D.		
23) Benzene	11.23	78	25110	249.390	pg	100
24) Carbon Tetrachloride	11.39	117	7554	236.719	pg	100
26) 1,2-Dichloropropane	12.05	63	260	12.433	pg	97
27) Bromodichloromethane	12.25	83	198	N.D.		
28) Trichloroethene	12.28	130	364	12.561	pg	95
29) 1,4-Dioxane	12.27	88	3753	185.446	pg	94
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	13.82	83	54	N.D.		
34) Toluene	14.11	91	40555	401.770	pg	100
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.26	166	1638	52.574	pg	100
39) Chlorobenzene	15.97	112	177	N.D.		
40) Ethylbenzene	16.35	91	7280	67.530	pg	99
41) m,p-Xylene	16.52	91	13709	169.285	pg	99
42) Styrene	16.89	104	947	15.638	pg	97
43) o-Xylene	17.00	106	2916	68.002	pg	99
44) 1,1,2,2-Tetrachloroethane	17.00	83	191	N.D.		
46) 1,3,5-Trimethylbenzene	18.27	105	1681	17.971	pg	99
47) 1,2,4-Trimethylbenzene	18.66	105	6547	71.826	pg	89
48) 1,3-Dichlorobenzene	18.81	146	73	N.D.		
49) 1,4-Dichlorobenzene	18.87	146	1637	26.498	pg	98
50) 1,2-Dichlorobenzene	19.20	146	106	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.83	182	163	N.D.		
53) Naphthalene	20.94	128	3531	28.943	pg	100

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Data File : I:\MS19\DATA\2019 04\05\04051916.D
Acq On : 5 Apr 2019 14:44
Sample : P1901824-008 (1000mL)
Misc : S31-03161901

Vial: 9
Operator: TD
Inst : MS19

Quant Time: Apr 06 10:57:54 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

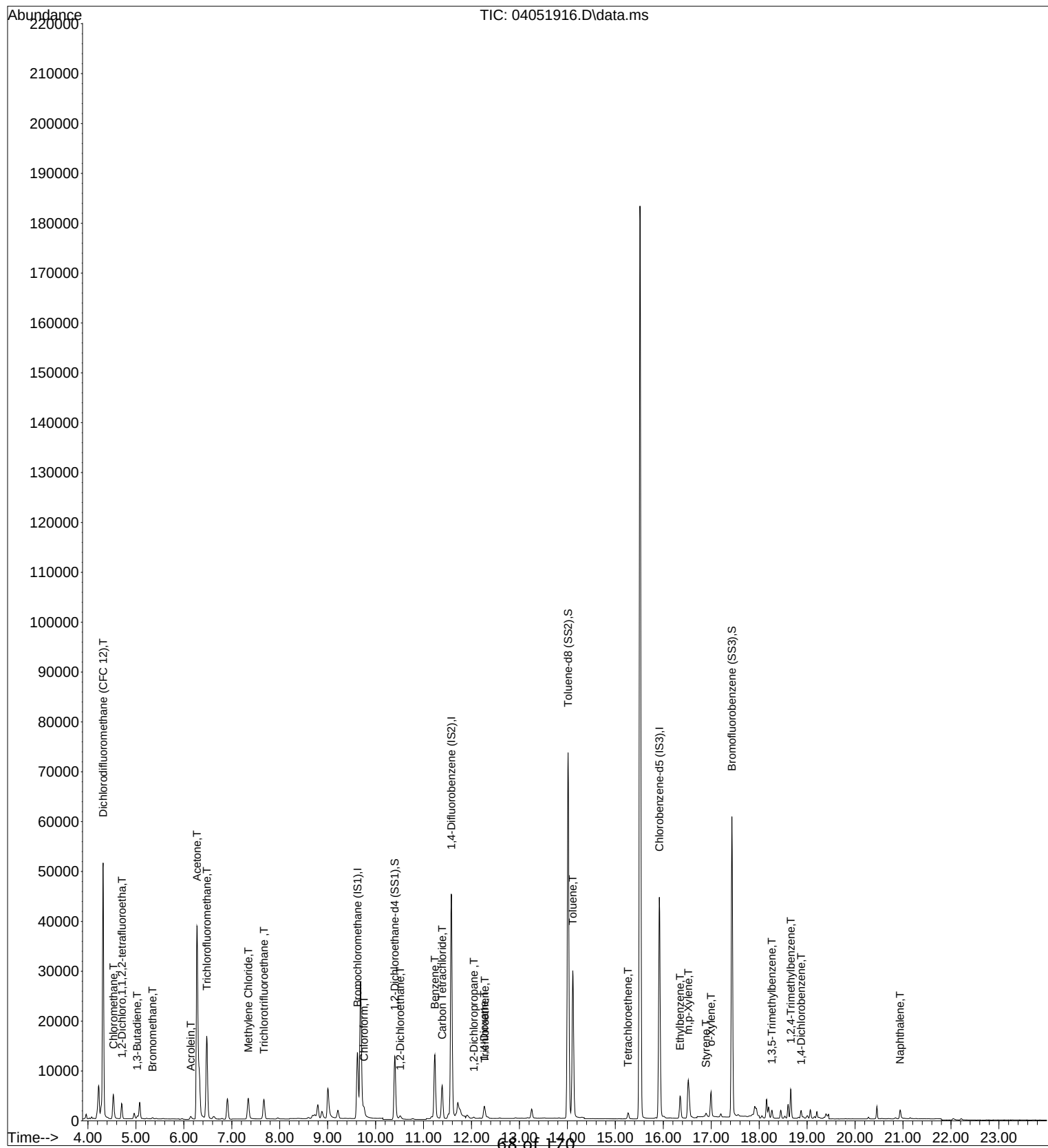
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	57	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051916.D
Acq On : 5 Apr 2019 14:44
Sample : P1901824-008 (1000mL)
Misc : S31-03161901

Vial: 9
Operator: TD
Inst : MS19

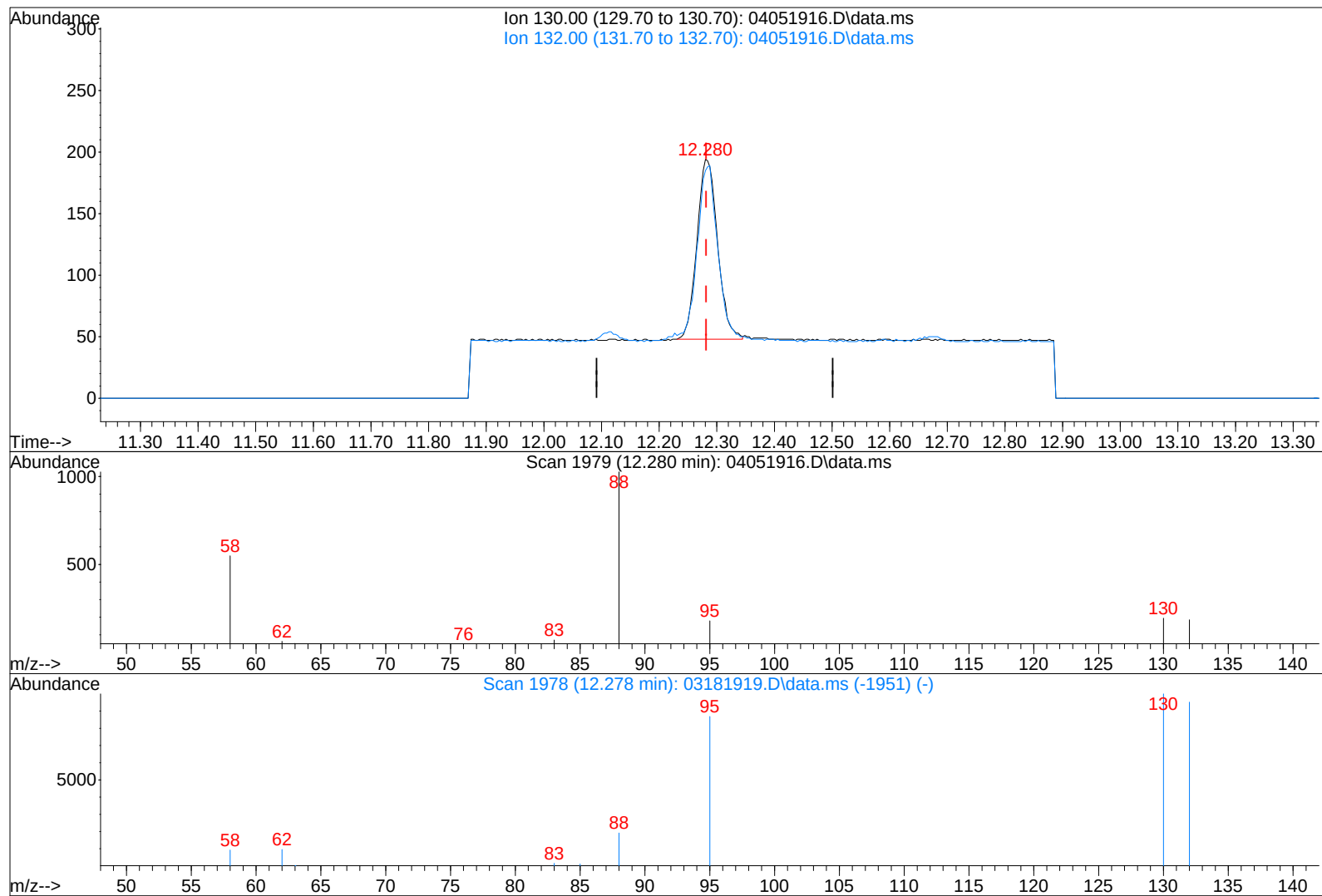
Quant Time: Apr 06 10:57:54 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 04\05\04051916.D
Acq On : 5 Apr 2019 14:44
Sample : P1901824-008 (1000mL)
Misc : S31-03161901

Vial: 9
Operator: TD
Inst : MS19

Quant Time: Apr 06 10:57:54 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051916.D\data.ms

(28) Trichloroethene (T)

12.280min (-0.001) 12.56pg

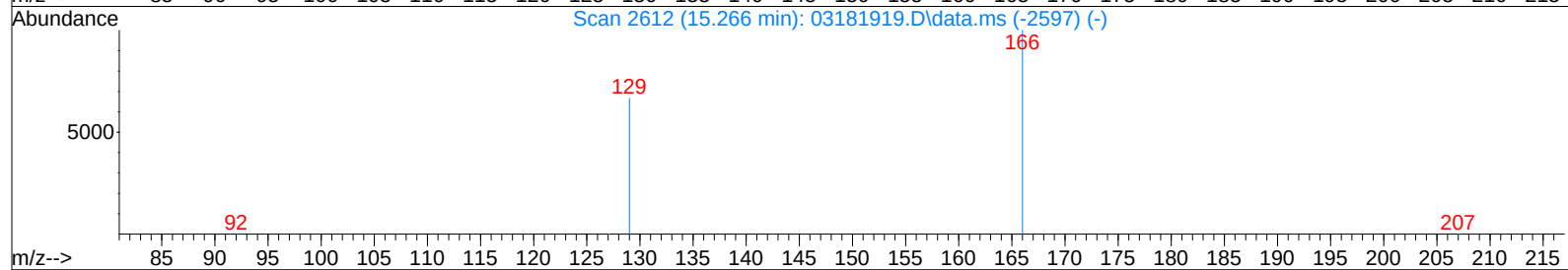
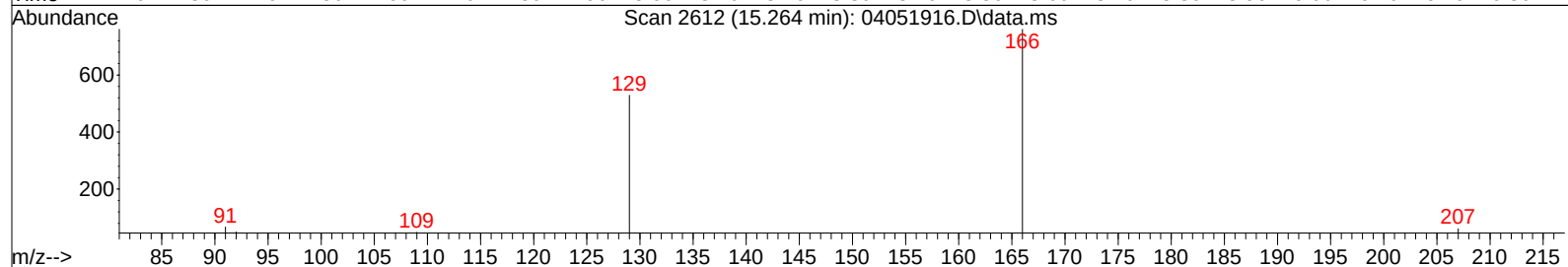
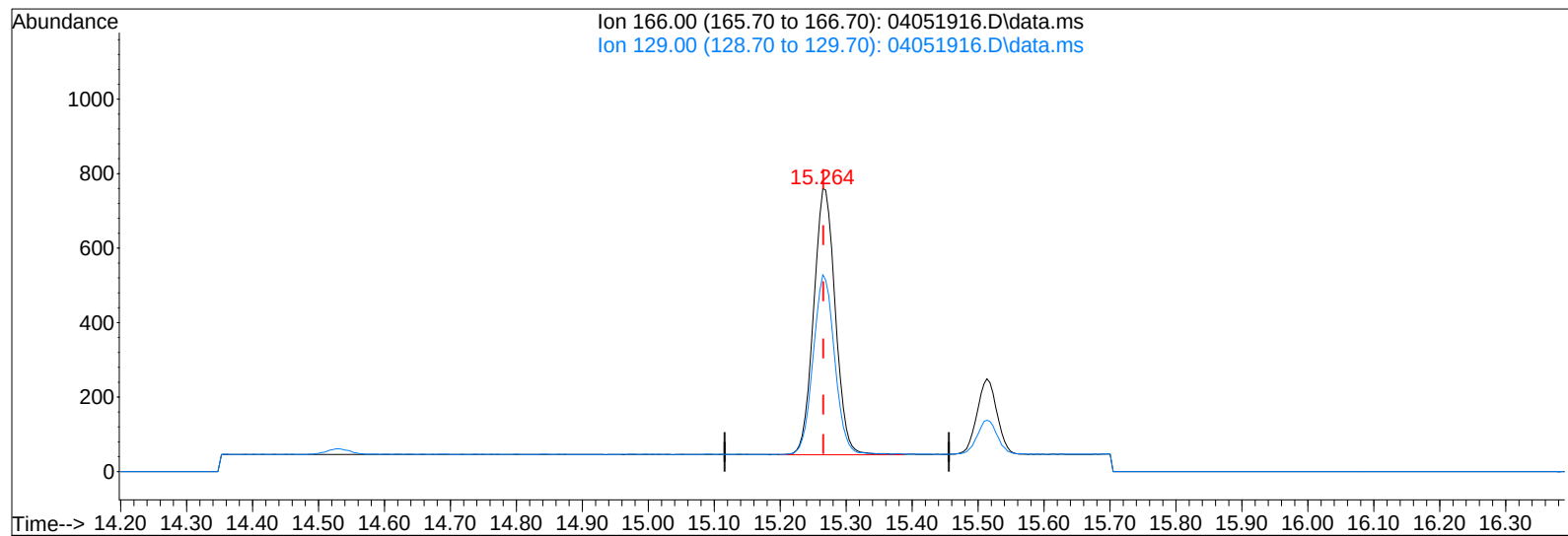
response 364

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	90.93
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051916.D
Acq On : 5 Apr 2019 14:44
Sample : P1901824-008 (1000mL)
Misc : S31-03161901

Vial: 9
Operator: TD
Inst : MS19

Quant Time: Apr 06 10:57:54 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051916.D\data.ms

(37) Tetrachloroethene (T)

15.264min (-0.001) 52.57pg

response 1638

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	66.30
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: HUCK AA F040219-2
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-009

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC01305

Date Collected: 4/2/19
 Date Received: 4/4/19
 Date Analyzed: 4/5/19
 Volume(s) Analyzed: 1.00 Liter(s)

Initial Pressure (psig): -2.68 Final Pressure (psig): 3.65

Container Dilution Factor: 1.53

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.17	0.014	ND	0.042	0.0036	
79-01-6	Trichloroethene	0.020	0.17	0.013	0.0037	0.031	0.0024	J
127-18-4	Tetrachloroethene	0.070	0.17	0.013	0.010	0.025	0.0019	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.

Data File : I:\MS19\DATA\2019 04\05\04051917.D
 Acq On : 5 Apr 2019 15:15
 Sample : P1901824-009 (1000mL)
 Misc : S31-03161901

Vial: 10
 Operator: TD
 Inst : MS19

Quant Time: Apr 09 10:35:29 2019

TD 4/9/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	20922	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	94035	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	11740	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	22055	904.371	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	90.44%
33) Toluene-d8 (SS2)	14.01	98	100307	1026.450	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	102.65%
45) Bromofluorobenzene (SS3)	17.43	174	50212	1124.391	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	112.44%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	59695	1377.779	pg	100
3) Chloromethane	4.53	52	2419	253.702	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.71	85	1852	59.426	pg	100
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	5.02	54	746	37.201	pg	86
7) Bromomethane	5.35	94	292	15.022	pg	98
8) Chloroethane	5.57	64	127	9.214	pg	# 42
9) Acrolein	6.14	56	2014	190.828	pg	97
10) Acetone	6.27	58	38160	2487.067	pg	89
11) Trichlorofluoromethane	6.48	101	22878	688.879	pg	100
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.34	84	4131	168.121	pg	89
14) Trichlorotrifluoroethane	7.67	151	6002	269.368	pg	100
15) trans-1,2-Dichloroethene	8.38	96	50	N.D.		
16) 1,1-Dichloroethane	8.58	63	88	N.D.		
17) Methyl tert-Butyl Ether	8.69	73	93	N.D.		
18) cis-1,2-Dichloroethene	9.45	96	54	N.D.		
19) Chloroform	9.76	83	1917	45.882	pg	98
21) 1,2-Dichloroethane	10.51	62	1095	44.511	pg	98
22) 1,1,1-Trichloroethane	10.78	97	169	N.D.		
23) Benzene	11.23	78	32838	317.757	pg	100
24) Carbon Tetrachloride	11.39	117	6892	210.420	pg	100
26) 1,2-Dichloropropane	12.05	63	257	11.960	pg	100
27) Bromodichloromethane	0.00	83	0	N.D.	d	
28) Trichloroethene	12.28	130	385	12.928	pg	99
29) 1,4-Dioxane	12.29	88	116	N.D.		
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	13.82	83	112	N.D.		
34) Toluene	14.11	91	65941	635.701	pg	100
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	15.27	166	1468	45.851	pg	99
39) Chlorobenzene	16.00	112	455	N.D.		
40) Ethylbenzene	16.35	91	10940	100.659	pg	100
41) m,p-Xylene	16.52	91	23855	292.189	pg	99
42) Styrene	16.89	104	1565	25.633	pg	98
43) o-Xylene	17.00	106	5014	115.981	pg	99
44) 1,1,2,2-Tetrachloroethane	16.99	83	264	N.D.		
46) 1,3,5-Trimethylbenzene	18.26	105	3508	37.200	pg	99
47) 1,2,4-Trimethylbenzene	18.66	105	12718	138.397	pg	89
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.	d	
49) 1,4-Dichlorobenzene	18.87	146	2081	33.413	pg	100
50) 1,2-Dichlorobenzene	19.20	146	78	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.82	182	93	N.D.		
53) Naphthalene	20.94	128	19146	155.666	pg	100

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Data File : I:\MS19\DATA\2019 04\05\04051917.D
Acq On : 5 Apr 2019 15:15
Sample : P1901824-009 (1000mL)
Misc : S31-03161901

Vial: 10
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:35:29 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

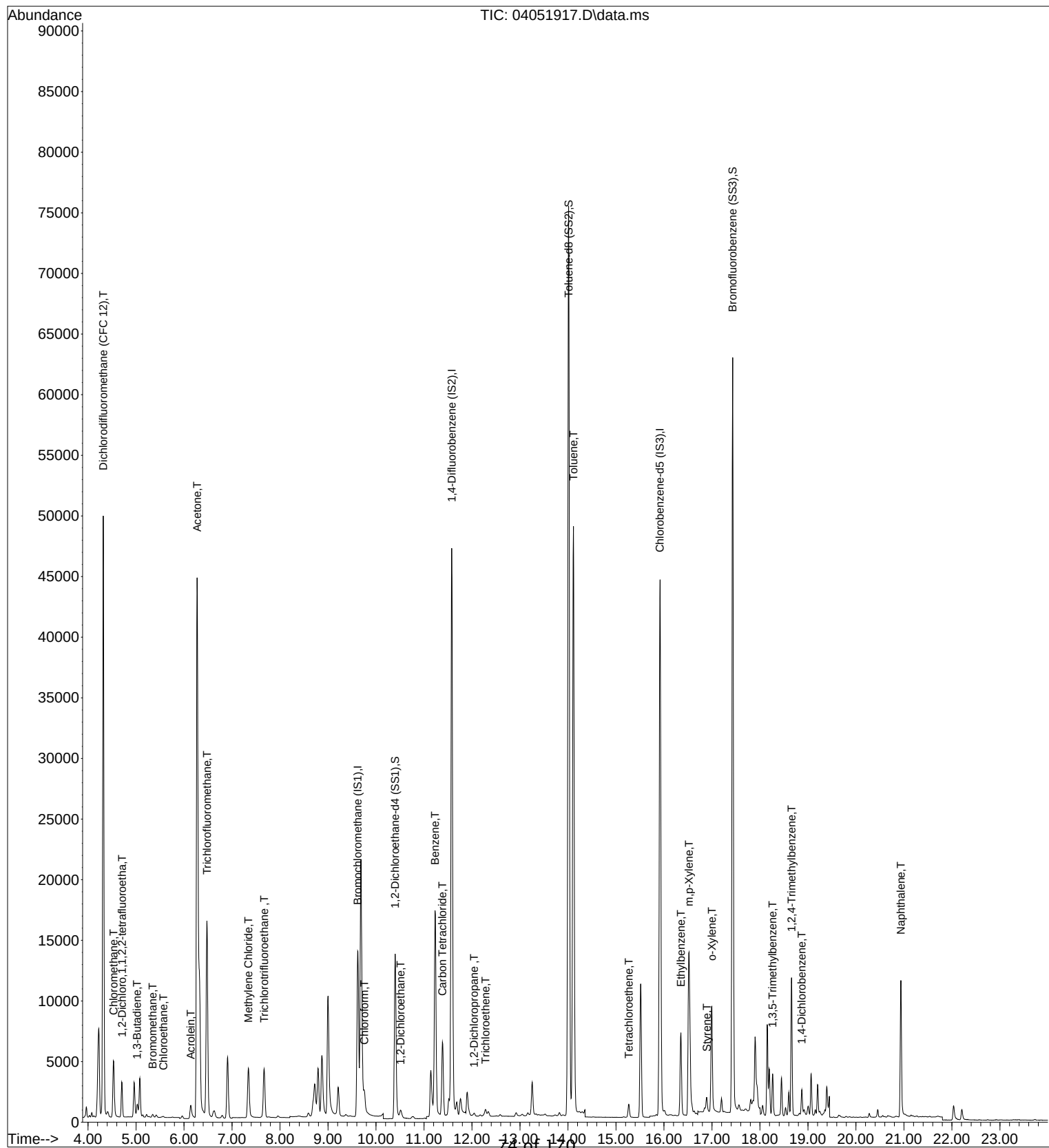
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	55	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051917.D
Acq On : 5 Apr 2019 15:15
Sample : P1901824-009 (1000mL)
Misc : S31-03161901

Vial: 10
Operator: TD
Inst : MS19

Quant Time: Apr 09 10:35:29 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

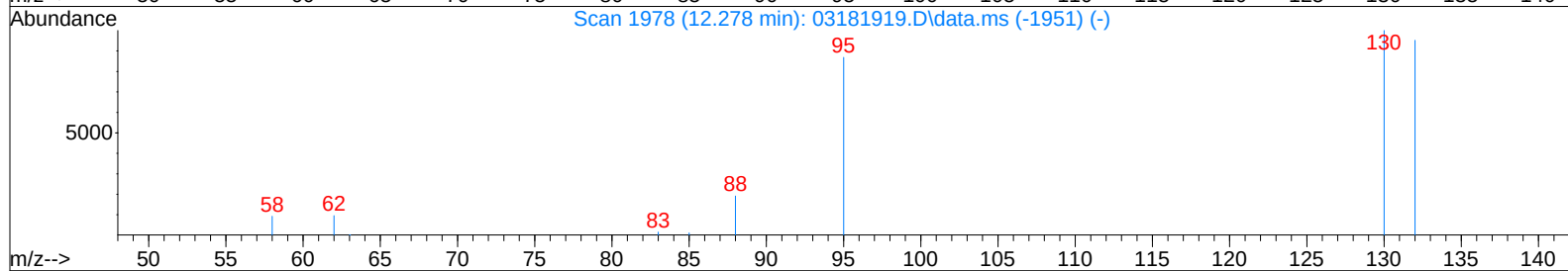
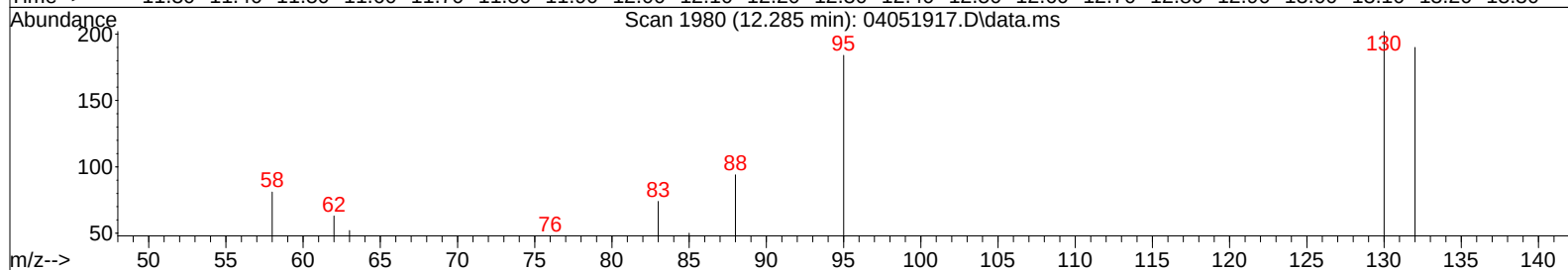
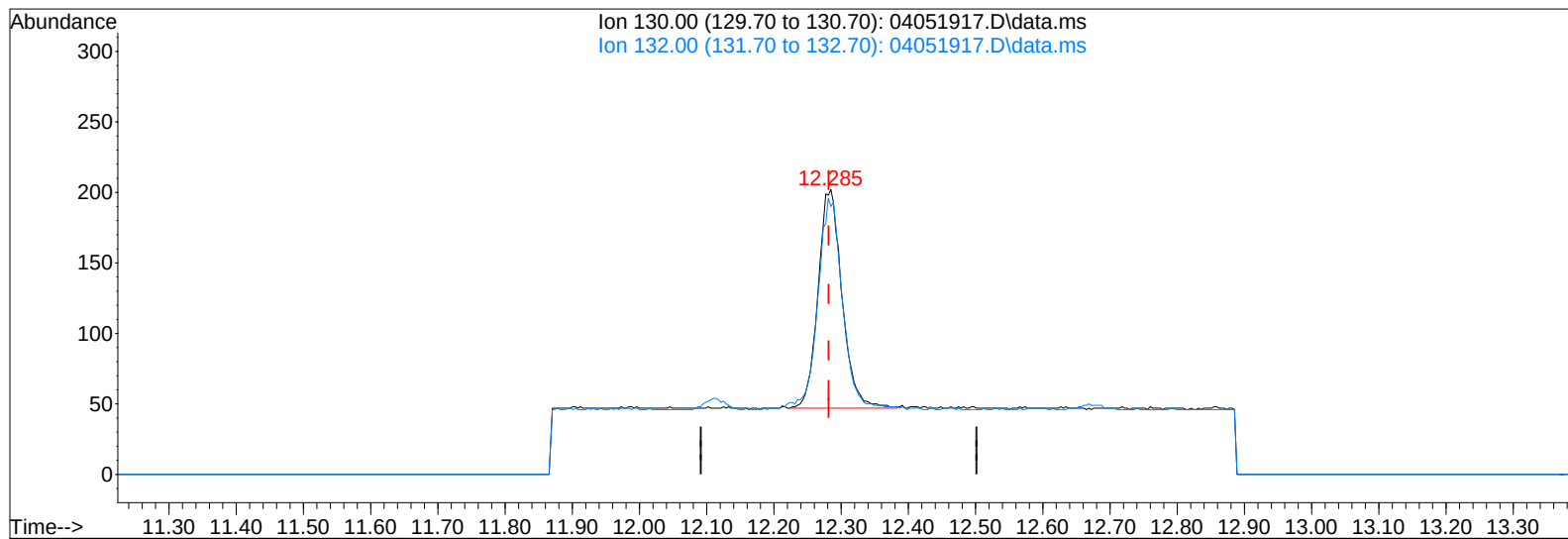


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Data File : I:\MS19\DATA\2019 04\05\04051917.D
Acq On : 5 Apr 2019 15:15
Sample : P1901824-009 (1000mL)
Misc : S31-03161901

Vial: 10
Operator: TD
Inst : MS19

Quant Time: Apr 06 10:57:55 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051917.D\data.ms

(28) Trichloroethene (T)

12.285min (+0.003) 12.93pg

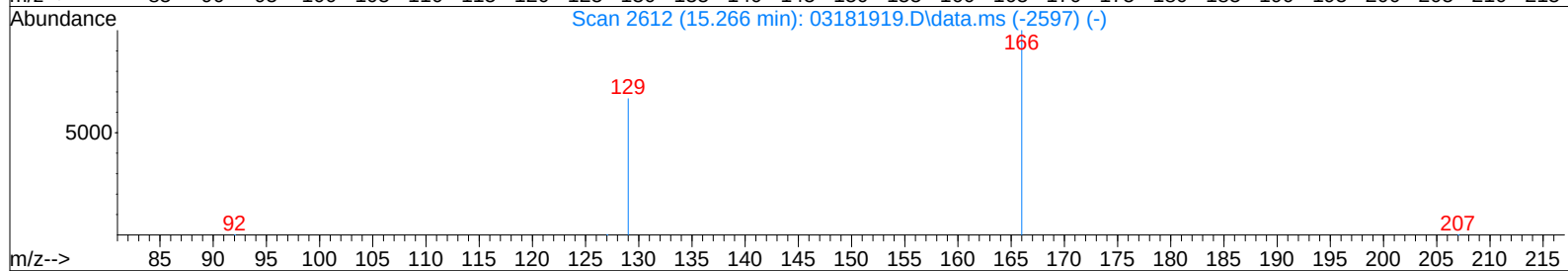
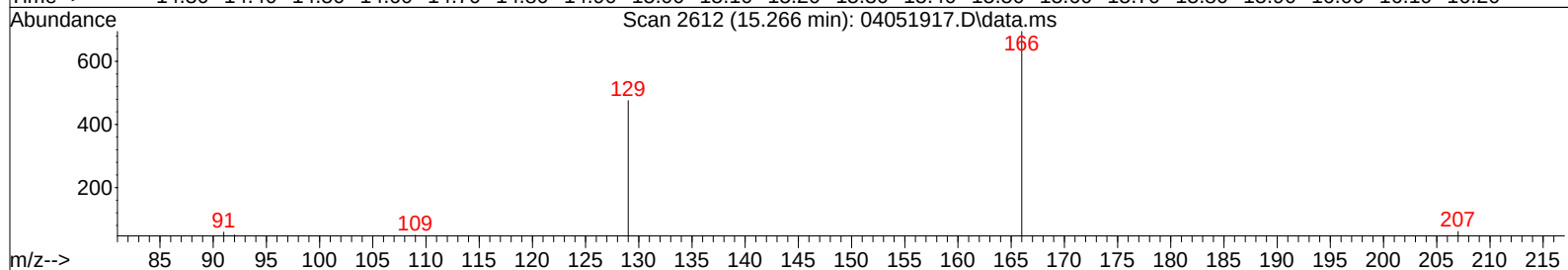
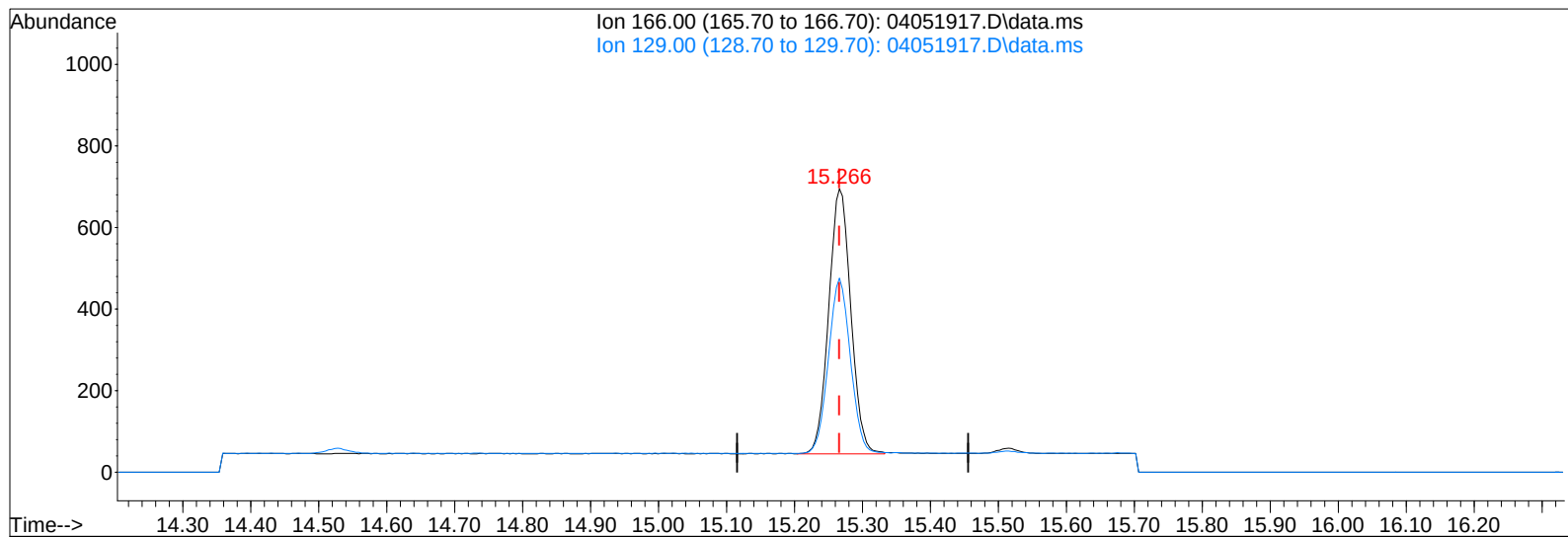
response 385

Ion	Exp%	Act%
130.00	100	100
132.00	95.60	96.36
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051917.D
Acq On : 5 Apr 2019 15:15
Sample : P1901824-009 (1000mL)
Misc : S31-03161901

Vial: 10
Operator: TD
Inst : MS19

Quant Time: Apr 06 10:57:55 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051917.D\data.ms

(37) Tetrachloroethene (T)

15.266min (+0.000) 45.85pg

response 1468

Ion	Exp%	Act%
166.00	100	100
129.00	66.70	65.60
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group
Client Sample ID: TRIPBLANK 040219-1
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
 ALS Sample ID: P1901824-010

Test Code: EPA TO-15 SIM
 Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
 Analyst: Topacio De Leon
 Sample Type: 6.0 L Summa Canister
 Test Notes:
 Container ID: AC02322

Date Collected: 4/2/19

Date Received: 4/4/19

Date Analyzed: 4/5/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.11	0.0092	ND	0.028	0.0023	
79-01-6	Trichloroethene	ND	0.11	0.0085	ND	0.020	0.0016	
127-18-4	Tetrachloroethene	ND	0.11	0.0082	ND	0.016	0.0012	

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.

Data File : I:\MS19\DATA\2019 04\05\04051908.D
 Acq On : 5 Apr 2019 10:32
 Sample : P1901824-010 (1000mL)
 Misc : S31-03161901

Vial: 11
 Operator: TD
 Inst : MS19

Quant Time: Apr 05 12:26:13 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/9/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.63	130	19730	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	84793	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	11158	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.41	65	21604	939.398	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	93.94%
33) Toluene-d8 (SS2)	14.02	98	90720	1029.530	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	102.95%
45) Bromofluorobenzene (SS3)	17.44	174	43213	1018.137	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	101.81%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.35	85	648	15.860	pg	99
3) Chloromethane	0.00	52	0	N.D.		
4) 1,2-Dichloro,1,1,2,2-t...	0.00	85	0	N.D.		
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	0.00	54	0	N.D.		
7) Bromomethane	0.00	94	0	N.D.		
8) Chloroethane	0.00	64	0	N.D.		
9) Acrolein	6.20	56	157	15.775	pg	# 15
10) Acetone	6.34	58	1854	128.134	pg	93
11) Trichlorofluoromethane	6.51	101	54	N.D.		
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.36	84	232	10.012	pg	93
14) Trichlorotrifluoroethane	0.00	151	0	N.D.		
15) trans-1,2-Dichloroethene	0.00	96	0	N.D.		
16) 1,1-Dichloroethane	0.00	63	0	N.D.		
17) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
18) cis-1,2-Dichloroethene	0.00	96	0	N.D.		
19) Chloroform	9.76	83	308	N.D.		
21) 1,2-Dichloroethane	0.00	62	0	N.D.		
22) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
23) Benzene	11.24	78	1014	10.405	pg	98
24) Carbon Tetrachloride	0.00	117	0	N.D.		
26) 1,2-Dichloropropane	0.00	63	0	N.D.		
27) Bromodichloromethane	0.00	83	0	N.D.		
28) Trichloroethene	0.00	130	0	N.D.		
29) 1,4-Dioxane	12.31	88	72	N.D.		
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.		
34) Toluene	14.12	91	1451	15.513	pg	98
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	0.00	166	0	N.D.		
39) Chlorobenzene	0.00	112	0	N.D.		
40) Ethylbenzene	16.37	91	303	N.D.		
41) m,p-Xylene	16.54	91	413	N.D.		
42) Styrene	16.91	104	79	N.D.		
43) o-Xylene	17.00	106	75	N.D.		
44) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
46) 1,3,5-Trimethylbenzene	18.20	105	59	N.D.		
47) 1,2,4-Trimethylbenzene	18.66	105	179	N.D.		
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
49) 1,4-Dichlorobenzene	18.88	146	118	N.D.		
50) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.83	182	54	N.D.		
53) Naphthalene	20.94	128	10470	89.566	pg	98

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Data File : I:\MS19\DATA\2019 04\05\04051908.D
Acq On : 5 Apr 2019 10:32
Sample : P1901824-010 (1000mL)
Misc : S31-03161901

Vial: 11
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:13 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

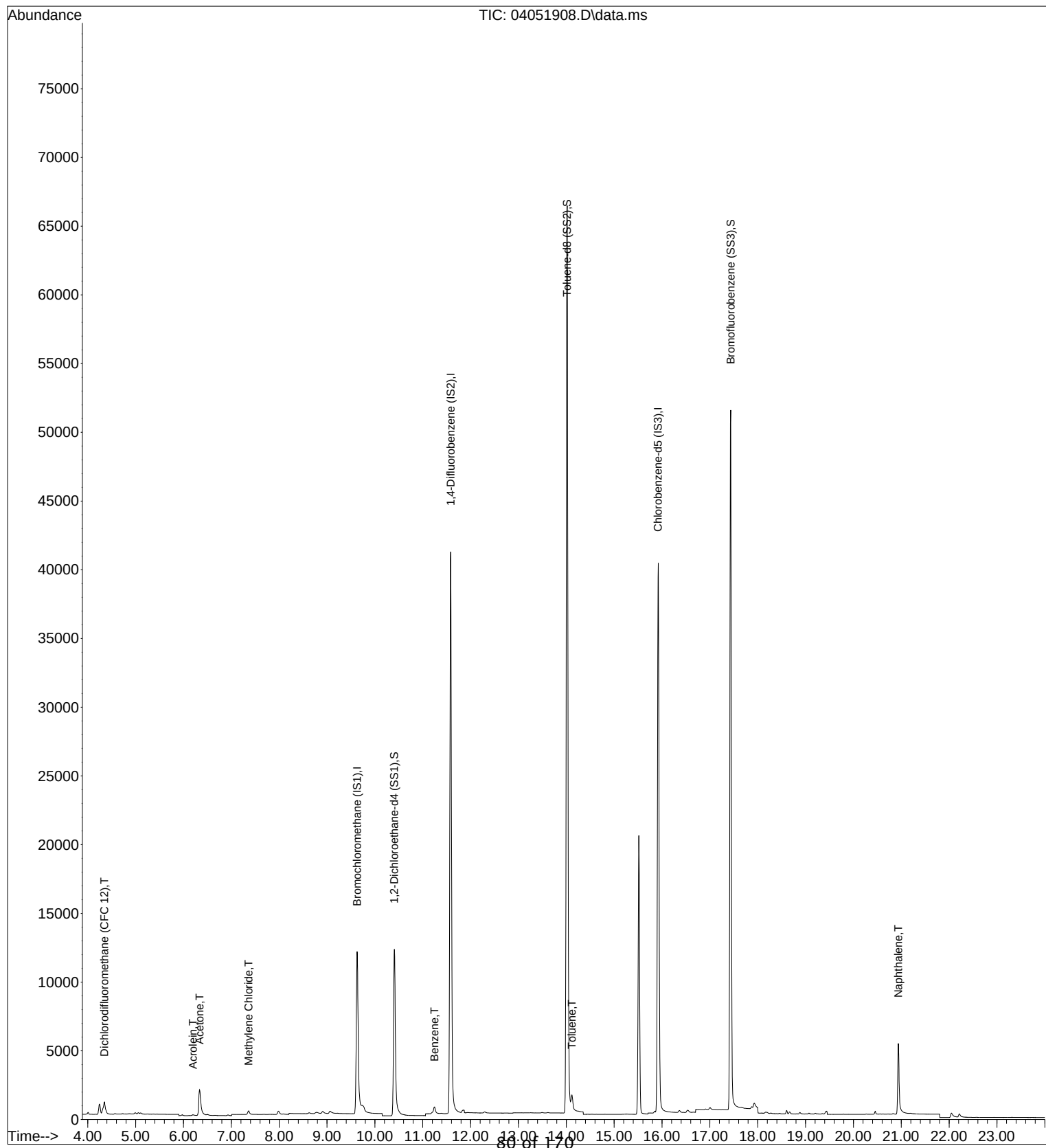
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	0.00	225	0	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051908.D
Acq On : 5 Apr 2019 10:32
Sample : P1901824-010 (1000mL)
Misc : S31-03161901

Vial: 11
Operator: TD
Inst : MS19

Quant Time: Apr 05 12:26:13 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Method Path : I:\MS19\METHODS\
 Method File : S19031819.M
 Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
 Last Update : Tue Mar 19 08:07:16 2019
 Response Via : Initial Calibration

TD 3/19/19

Calibration Files

20 =03181915.D 50 =03181916.D 100 =03181917.D 500 =03181918.D 1000=03181919.D
 2000=03181920.D 5000=03181921.D 10K =03181922.D 25K =03181923.D 50K =03181924.D

Compound	20	50	100	500	1000	2000	5000	10K	25K	50K	Avg	%RSD
-----ISTD-----												
1) I Bromochloromethane...												
2) T Dichlorodifluo...	2.673	2.306	2.123	2.067	2.232	2.044	1.900	1.859	1.789	1.717	2.071	13.71
3) T Chloromethane	0.642	0.514	0.454	0.407	0.485	0.444	0.413	0.382	0.416	0.399	0.456	16.95
4) T 1,2-Dichloro,1...	1.921	1.655	1.510	1.470	1.584	1.463	1.367	1.344	1.308	1.273	1.490	13.06
5) T Vinyl Chloride	1.653	1.443	1.297	1.287	1.391	1.277	1.195	1.180	1.159	1.095	1.298	12.62
6) T 1,3-Butadiene	1.351	1.063	0.917	0.844	0.994	1.014	0.842	0.837	0.898	0.825	0.958	16.84
7) T Bromomethane	1.288	1.021	0.937	0.887	0.963	0.891	0.838	0.834	0.828	0.803	0.929	15.45
8) T Chloroethane	0.834	0.703	0.652	0.645	0.695	0.646	0.613	0.613	0.604	0.584	0.659	11.00
9) T Acrolein	0.634	0.545	0.505	0.506	0.513	0.491	0.471	0.468	0.463	0.447	0.504	10.73
10) T Acetone			0.827	0.735	0.650	0.604	0.569	0.553	0.530		0.638	16.93
11) T Trichlorofluor...	2.005	1.722	1.583	1.540	1.668	1.561	1.484	1.485	1.442	1.384	1.587	11.21
12) T 1,1-Dichloroet...	1.397	1.171	1.091	1.089	1.196	1.131	1.088	1.087	1.065	1.032	1.135	9.18
13) T Methylene Chlo...	1.510	1.261	1.159	1.144	1.220	1.151	1.098	1.093	1.072	1.036	1.174	11.57
14) T Trichlorotrifl...	1.394	1.198	1.090	0.941	1.171	1.059	0.977	0.945	0.955	0.921	1.065	14.27
15) T trans-1,2-Dich...	1.387	1.236	1.168	1.182	1.300	1.217	1.173	1.171	1.155	1.121	1.211	6.53
16) T 1,1-Dichloroet...	2.128	1.803	1.708	1.669	1.870	1.746	1.655	1.631	1.612	1.539	1.736	9.66
17) T Methyl tert-Bu...	3.291	2.856	2.671	2.800	3.205	3.051	2.965	2.952	2.947	2.812	2.955	6.38
18) T cis-1,2-Dichlo...	1.539	1.302	1.214	1.253	1.372	1.305	1.257	1.244	1.220	1.174	1.288	8.10
19) T Chloroform		2.268	1.943	1.822	1.991	1.851	1.767	1.748	1.709	1.630	1.859	10.22
20) S 1,2-Dichloroet...	1.170	1.180	1.182	1.178	1.159	1.162	1.170	1.163	1.149	1.142	1.166	1.12
21) T 1,2-Dichloroet...	1.360	1.230	1.151	1.171	1.275	1.192	1.137	1.123	1.086	1.034	1.176	8.02
22) T 1,1,1-Trichlor...	2.036	1.746	1.608	1.605	1.773	1.660	1.589	1.571	1.549	1.488	1.662	9.45
23) T Benzene	7.458	5.551	4.919	4.689	4.999	4.669	4.433	4.384	4.246	4.048	4.939	19.91
24) T Carbon Tetrach...	1.933	1.630	1.497	1.509	1.654	1.553	1.494	1.493	1.471	1.421	1.566	9.41
-----ISTD-----												
25) I 1,4-Difluorobenzen...												
26) T 1,2-Dichloropr...	0.283	0.246	0.227	0.223	0.246	0.228	0.216	0.213	0.207	0.197	0.229	10.72
27) T Bromodichlorom...	0.382	0.335	0.307	0.303	0.338	0.317	0.303	0.302	0.296	0.281	0.316	9.13
28) T Trichloroethene	0.387	0.338	0.310	0.306	0.340	0.316	0.299	0.297	0.293	0.282	0.317	9.70
29) T 1,4-Dioxane	0.260	0.223	0.214	0.219	0.237	0.223	0.213	0.212	0.210	0.200	0.221	7.54
30) T cis-1,3-Dichlo...	0.370	0.335	0.315	0.339	0.387	0.374	0.366	0.369	0.361	0.343	0.356	6.20
31) T trans-1,3-Dich...	0.252	0.235	0.236	0.281	0.322	0.318	0.320	0.327	0.322	0.311	0.292	12.89
32) T 1,1,2-Trichlor...	0.254	0.223	0.206	0.204	0.224	0.208	0.196	0.195	0.191	0.183	0.208	9.91
33) S Toluene-d8 (SS2)	1.062	1.055	1.047	1.036	1.033	1.031	1.030	1.035	1.029	1.032	1.039	1.12
34) T Toluene	1.404	1.217	1.109	1.087	1.166	1.091	1.028	1.020	0.986	0.924	1.103	12.31
35) T Dibromochlorom...	0.341	0.296	0.281	0.278	0.315	0.297	0.284	0.285	0.282	0.272	0.293	7.08
36) T 1,2-Dibromoethane	0.319	0.280	0.269	0.276	0.305	0.288	0.276	0.275	0.269	0.258	0.281	6.46
37) T Tetrachloroethene	0.438	0.376	0.345	0.334	0.361	0.334	0.313	0.310	0.303	0.291	0.340	12.74

Chlorobenzene-d5 (		ISTD-----																		
38) I	Chlorobenzene-d5	7.835	6.662	6.188	6.105	6.576	6.220	5.770	5.540	5.049	4.321	6.026	15.85							
39) T	Chlorobenzene	1.072	0.929	0.887	0.949	1.042	1.006	0.945	0.908	0.827	0.693	0.926	E1	11.82						
40) T	Ethylbenzene	7.528	6.816	6.697	7.318	7.982	7.635	7.124	6.858	6.189	5.395	6.954	10.85							
41) T	m,p-Xylene	4.140	4.033	4.408	5.458	6.188	6.180	5.946	5.777	5.355	4.520	5.200	16.33							
42) T	Styrene	4.064	3.659	3.598	3.941	4.203	4.010	3.726	3.593	3.284	2.746	3.682	11.61							
43) T	o-Xylene	4.316	3.723	3.574	3.676	3.918	3.708	3.438	3.300	2.987	2.519	3.516	14.18							
44) T	1,1,2,2-Tetrac...	3.703	3.735	3.839	3.946	3.965	3.969	3.963	3.928	3.675	3.316	3.804	5.44							
45) S	Bromofluoroben...	8.730	7.927	8.009	8.900	9.187	8.747	8.141	7.836	7.033	5.814	8.032	12.49							
46) T	1,3,5-Trimethy...	8.067	7.621	7.806	8.927	9.152	8.746	8.125	7.776	6.805	5.249	7.828	14.56							
47) T	1,2,4-Trimethy...	5.767	5.338	5.240	5.603	5.830	5.547	5.164	4.978	4.395	3.669	5.153	13.00							
48) T	1,3-Dichlorobe...	6.445	5.658	5.444	5.632	5.898	5.619	5.248	5.053	4.351	3.703	5.305	14.80							
49) T	1,4-Dichlorobe...	6.289	5.643	5.400	5.642	5.648	5.358	4.975	4.771	4.195	3.397	5.132	16.29							
50) T	1,2-Dichlorobe...	1.977	1.744	1.741	1.989	1.975	1.942	1.868	1.817	1.617	1.396	1.807	10.52							
51) T	1,2-Dibromo-3-...	3.526	3.325	3.242	3.584	3.826	3.736	3.575	3.466	2.854	2.462	3.360	12.44							
52) T	1,2,4-Trichlor...	0.979	0.893	0.895	1.107	1.293	1.271	1.218	1.181	0.912	0.727	1.048	E1	18.39						
53) T	Naphthalene																			
54) T	Hexachlorobuta...	3.091	2.865	2.879	2.589	2.466	2.298	2.211	1.988	1.709	2.455	18.37								

S19031819.M Tue Mar 19 08:10:53 2019

Primary Source Standards Concentrations (Working & Initial Calibration)

TD 3/19/19

		20ng/L Std. ID: S31-03131906 1ng/L Std. ID: S31-03131905 200ng/L Std. ID: S31-03131901				Primary Working Standards			
Dilution Factors:		Source Std. mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	5000	1000	250
Compounds									
Propene		1.031	206.2	20.62	4.124	1.031	0.2062	0.2062	
Dichlorodifluoromethane		1.045	209.0	20.90	4.180	1.045	0.2090		
Chloromethane		1.008	201.6	20.16	4.032	1.008	0.2016		
Freon-114		1.028	205.6	20.56	4.112	1.028	0.2056		
Vinyl Chloride		1.051	210.2	21.02	4.204	1.051	0.2102		
1,3-Butadiene		1.049	209.8	20.98	4.196	1.049	0.2098		
Bromomethane		1.009	201.8	20.18	4.036	1.009	0.2018		
Chloroethane		1.022	204.4	20.44	4.088	1.022	0.2044		
Ethanol		5.140	1028.0	102.80	20.560	5.140	1.0280		
Acetonitrile		1.033	206.6	20.66	4.132	1.033	0.2066		
Acrolein		1.028	205.6	20.56	4.112	1.028	0.2056		
Acetone		5.370	1074.0	107.40	21.480	5.370	1.0740		
Trichlorofluoromethane		1.060	212.0	21.20	4.240	1.060	0.2120		
Isopropanol		2.063	412.6	41.26	8.252	2.063	0.4126		
Acrylonitrile		1.034	206.8	20.68	4.136	1.034	0.2068		
1,1-Dichloroethene		1.074	214.8	21.48	4.296	1.074	0.2148		
tert-Butanol		2.144	428.8	42.88	8.576	2.144	0.4288		
Methylene Chloride		1.070	214.0	21.40	4.280	1.070	0.2140		
Allyl Chloride		1.067	213.4	21.34	4.268	1.067	0.2134		
Trichlorofluoroethane		1.065	213.0	21.30	4.260	1.065	0.2130		
Carbon Disulfide		1.075	215.0	21.50	4.300	1.075	0.2150		
trans-1,2-Dichloroethene		1.062	212.4	21.24	4.248	1.062	0.2124		
1,1-Dichloroethane		1.030	206.0	20.60	4.120	1.030	0.2060		
Methyl tert-Butyl Ether		1.089	217.8	21.78	4.356	1.089	0.2178		
Vinyl Acetate		5.252	1050.4	105.04	21.008	5.252	1.0504		
2-Butanone		1.027	205.4	20.54	4.108	1.027	0.2054		
cis-1,2-Dichloroethene		1.054	210.8	21.08	4.216	1.054	0.2108		
Diisopropyl Ether		1.081	216.2	21.62	4.324	1.081	0.2162		
Ethyl Acetate		2.166	433.2	43.32	8.664	2.166	0.4332		
n-Hexane		1.082	216.4	21.64	4.328	1.082	0.2164		
Chloroform		1.077	215.4	21.54	4.308	1.077	0.2154		
Tetrahydrofuran		1.068	213.6	21.36	4.272	1.068	0.2136		
Ethyl tert-Butyl Ether		1.060	212.0	21.20	4.240	1.060	0.2120		
1,2-Dichloroethane		1.061	212.2	21.22	4.244	1.061	0.2122		
1,1,1-Trichloroethane		1.081	216.2	21.62	4.324	1.081	0.2162		
Isopropyl Acetate		2.066	413.2	41.32	8.264	2.066	0.4132		
1-Butanol		2.067	413.4	41.34	8.268	2.067	0.4134		
Benzene		1.033	206.6	20.66	4.132	1.033	0.2066		
Carbon Tetrachloride		1.036	207.2	20.72	4.144	1.036	0.2072		
Cyclohexane		2.087	417.4	41.74	8.348	2.087	0.4174		
tert-Amyl Methyl Ether		1.074	214.8	21.48	4.296	1.074	0.2148		
1,2-Dichloropropane		1.073	214.6	21.46	4.292	1.073	0.2146		
Bromodichloromethane		1.068	213.6	21.36	4.272	1.068	0.2136		
Trichloroethene		1.062	212.4	21.24	4.248	1.062	0.2124		
1,4-Dioxane		1.064	212.8	21.28	4.256	1.064	0.2128		
Isocutane		1.061	212.2	21.22	4.244	1.061	0.2122		
Methyl Methacrylate		2.135	427.0	42.70	8.540	2.135	0.4270		
n-Heptane		1.076	215.2	21.52	4.304	1.076	0.2152		
cis-1,3-Dichloropropene		1.120	224.0	22.40	4.480	1.120	0.2240		

Working STD Conc.(ng/L):		1	1	1	1	1	20	20	20	20	20	200	200
Injection (L):		0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
ICAL Points:		0.02ng	0.05ng	0.1ng	0.5ng	1ng	2ng	5ng	10ng	25ng	50ng	250ng	500ng
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00
	NA	0.020	0.050	0.100	0.500	0.050	0.100	0.250	0.500	1.000	2.500	50.00	125.00

Primary Source Standards Concentrations (Working & Initial Calibration)

		20ng/L Std. ID: S31-03131906 1ng/L Std. ID: S31-03131905 200ng/L Std. ID: S31-03131901					Primary Working Standards				
Dilution Factors:		5	50	250	1000	5000	200ng/L	40ng/L	10ng/L	2ng/L	0.2ng/L
Compounds	Source Std. mg/m ³	200ng/L	20ng/L	4ng/L	1ng/L	0.2ng/L	20ng/L	4ng/L	1ng/L	2ng/L	0.2ng/L
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060	0.2120	212.0	21.20	4.240	1.060	0.2120
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055	0.2110	211.0	21.10	4.220	1.055	0.2110
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076	0.2152	215.2	21.52	4.304	1.076	0.2152
Toluene	1.052	210.4	21.04	4.208	1.052	0.2104	210.4	21.04	4.208	1.052	0.2104
2-Hexanone	1.074	214.8	21.48	4.296	1.074	0.2148	214.8	21.48	4.296	1.074	0.2148
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075	0.2150	215.0	21.50	4.300	1.075	0.2150
1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076	0.2152	215.2	21.52	4.304	1.076	0.2152
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085	0.2170	217.0	21.70	4.340	1.085	0.2170
n-Octane	1.076	215.2	21.52	4.304	1.076	0.2152	215.2	21.52	4.304	1.076	0.2152
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058	0.2116	211.6	21.16	4.232	1.058	0.2116
Chlorobenzene	1.066	213.2	21.32	4.264	1.066	0.2132	213.2	21.32	4.264	1.066	0.2132
Ethylbenzene	1.033	206.6	20.66	4.132	1.033	0.2066	206.6	20.66	4.132	1.033	0.2066
m- <i>p</i> -Xylene	2.123	424.6	42.46	8.492	2.123	0.4246	424.6	42.46	8.492	2.123	0.4246
Bromoforn	1.063	212.6	21.26	4.252	1.063	0.2126	212.6	21.26	4.252	1.063	0.2126
Styrene	1.060	212.0	21.20	4.240	1.060	0.2120	212.0	21.20	4.240	1.060	0.2120
o-Xylene	1.062	212.4	21.24	4.248	1.062	0.2124	212.4	21.24	4.248	1.062	0.2124
n-Nonane	1.071	214.2	21.42	4.284	1.071	0.2142	214.2	21.42	4.284	1.071	0.2142
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064	0.2128	212.8	21.28	4.256	1.064	0.2128
Cumene	1.057	211.4	21.14	4.228	1.057	0.2114	211.4	21.14	4.228	1.057	0.2114
alpha-Phenene	1.035	207.0	20.70	4.140	1.035	0.2070	207.0	20.70	4.140	1.035	0.2070
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076	0.2152	215.2	21.52	4.304	1.076	0.2152
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062	0.2124	212.4	21.24	4.248	1.062	0.2124
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061	0.2122	212.2	21.22	4.244	1.061	0.2122
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057	0.2114	211.4	21.14	4.228	1.057	0.2114
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058	0.2116	211.6	21.16	4.232	1.058	0.2116
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072	0.2144	214.4	21.44	4.288	1.072	0.2144
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068	0.2136	213.6	21.36	4.272	1.068	0.2136
n-Decane	1.076	215.2	21.52	4.304	1.076	0.2152	215.2	21.52	4.304	1.076	0.2152
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051	0.2102	210.2	21.02	4.204	1.051	0.2102
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080	0.2160	216.0	21.60	4.320	1.080	0.2160
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081	0.2162	216.2	21.62	4.324	1.081	0.2162
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063	0.2126	212.6	21.26	4.252	1.063	0.2126
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042	0.2084	208.4	20.84	4.168	1.042	0.2084
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042	0.2084	208.4	20.84	4.168	1.042	0.2084
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089	0.2178	217.8	21.78	4.356	1.089	0.2178
d-Limonene	1.010	202.0	20.20	4.040	1.010	0.2020	202.0	20.20	4.040	1.010	0.2020
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042	0.2084	208.4	20.84	4.168	1.042	0.2084
n-Undecane	1.057	211.4	21.14	4.228	1.057	0.2114	211.4	21.14	4.228	1.057	0.2114
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064	0.2128	212.8	21.28	4.256	1.064	0.2128
Naphthalene	1.025	205.0	20.50	4.100	1.025	0.2050	205.0	20.50	4.100	1.025	0.2050
n-Dodecane	1.031	206.2	20.62	4.124	1.031	0.2062	206.2	20.62	4.124	1.031	0.2062
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053	0.2106	210.6	21.06	4.212	1.053	0.2106
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041	0.2082	208.2	20.82	4.164	1.041	0.2082
Cyclohexanone	0.982	196.4	19.64	3.928	0.982	0.1964	196.4	19.64	3.928	0.982	0.1964
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067	0.2134	213.4	21.34	4.268	1.067	0.2134
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064	0.2128	212.8	21.28	4.256	1.064	0.2128

Working STD Conc. (ng/L)													
Injection (L):													
ICAL Points:													
NA	1	1	1	1	1	1	20	20	20	20	20	200	200
NA	0.020	0.050	0.100	0.500	0.500	0.500	0.050	0.100	0.250	0.500	10ng	25ng	50ng
0.01ng	0.02ng	0.05ng	0.1ng	0.5ng	1ng	1ng	1ng	2ng	5ng	10ng	10ng	25ng	50ng
NA	0.02120	0.05300	0.1060	0.5300	1.060	1.060	1.060	2.120	5.300	10.60	10.60	26.500	53.00
NA	0.02110	0.05275	0.1055	0.5275	1.055	1.055	1.055	2.110	5.275	10.55	10.55	26.375	52.75
NA	0.02152	0.05380	0.1076	0.5380	1.076	1.076	1.076	2.152	5.380	10.76	10.76	26.900	53.80
NA	0.02104	0.05260	0.1052	0.5260	1.052	1.052	1.052	2.104	5.260	10.52	10.52	26.300	52.60
NA	0.02148	0.05370	0.1074	0.5370	1.074	1.074	1.074	2.148	5.370	10.74	10.74	26.850	53.70
NA	0.02150	0.05375	0.1075	0.5375	1.075	1.075	1.075	2.150	5.375	10.75	10.75	26.875	53.75
NA	0.02152	0.05380	0.1076	0.5380	1.076	1.076	1.076	2.152	5.380	10.76	10.76	26.900	53.80
NA	0.02170	0.05425	0.1085	0.5425	1.085	1.085	1.085	2.170	5.425	10.85	10.85	27.125	54.25
NA	0.02152	0.05380	0.1076	0.5380	1.076	1.076	1.076	2.152	5.380	10.76	10.76	26.900	53.80
NA	0.02116	0.05290	0.1058	0.5290	1.058	1.058	1.058	2.116	5.290	10.58	10.58	26.450	52.90
NA	0.02132	0.05330	0.1066	0.5330	1.066	1.066	1.066	2.132	5.330	10.66	10.66	26.650	53.30
NA	0.02066	0.05165	0.1033	0.5165	1.033	1.033	1.033	2.066	5.165	10.33	10.33	25.825	51.65
NA	0.04246	0.10615	0.2123	1.0615	2.123	2.123	2.123	4.246	10.615	21.23	21.23	53.075	106.15
NA	0.02126	0.05315	0.1063	0.5315	1.063	1.063	1.063	2.126	5.315	10.63	10.63	26.575	53.15
NA	0.02120	0.05300	0.1060	0.5300	1.060	1.060	1.060	2.120	5.300	10.60	10.60	26.500	53.00
NA	0.02124	0.05310	0.1062	0.5310	1.062	1.062	1.062	2.124	5.310	10.62	10.62	26.550	53.10
NA	0.02142	0.05355	0.1071	0.5355	1.071	1.071	1.071	2.142	5.355	10.71	10.71	26.775	53.55
NA	0.02128	0.05320	0.1064	0.5320	1.064	1.064	1.064	2.128	5.320	10.64	10.64	26.600	53.20
NA	0.02114	0.05285	0.1057	0.5285	1.057	1.057	1.057	2.114	5.285	10.57	10.57	26.425	52.85
NA	0.02070	0.05175	0.1035	0.5175	1.035	1.035	1.035	2.070	5.175	10.35	10.35	25.875	51.75
NA	0.02152	0.05380	0.1076	0.5380	1.076	1.076	1.076	2.152	5.380	10.76	10.76	26.900	53.80
NA	0.02124	0.05310	0.1062	0.5310	1.062	1.062	1.062	2.124	5.310	10.62	10.62	26.550	53.10
NA	0.02122	0.05305	0.1061	0.5305	1.061	1.061	1.061	2.122	5.305	10.61	10.61	26.525	53.05
NA	0.02114	0.05285	0.1057	0.5285	1.057	1.057	1.057	2.114	5.285	10.57	10.57	26.425	52.85
NA	0.02116	0.05290	0.1058	0.5290	1.058	1.058	1.058	2.116	5.290	10.58	10.58	26.450	52.90
NA	0.02144	0.05360	0.1072	0.5360	1.072	1.072	1.072	2.144	5.360	10.72	10.72	26.800	53.60
NA	0.02136	0.05340	0.1068	0.5340	1.068	1.068	1.068	2.136	5.340	10.68	10.68	26.700	53.40
NA	0.02152	0.05380	0.1076	0.5380	1.076	1.076	1.076	2.152	5.380	10.76	10.76	26.900	53.80
NA	0.02102	0.05255	0.1051	0.5255	1.051	1.051	1.051	2.102	5.255	10.51	10.51	26.275	52.55
NA	0.02160	0.05400	0.1080	0.5400	1.080	1.080	1.080	2.160	5.400	10.80	10.80	27.000	54.00
NA	0.02162	0.05405	0.1081	0.5405	1.081	1.081	1.081	2.162	5.405	10.81	10.81	27.025	54.05
NA	0.02126	0.05315	0.1063	0.5315	1.063	1.063	1.063	2.126	5.315	10.63	10.63	26.575	53.15
NA	0.02084	0.05210	0.1042	0.5210	1.042	1.042	1.042	2.084	5.210	10.42	10.42	26.050	52.10
NA	0.02084	0.05210	0.1042	0.5210	1.042	1.042	1.042	2.084	5.210	10.42	10.42	26.050	52.10
NA	0.02178	0.05445	0.1089	0.5445	1.089	1.089	1.089	2.178	5.445	10.89	10.89	27.225	54.45
NA	0.02020	0.05050	0.1010	0.5050	1.010	1.010	1.010	2.020	5.050	10.10	10.10	25.250	50.50
NA	0.02084	0.05210	0.1042	0.5210	1.042	1.042	1.042	2.084	5.210	10.42	10.42	26.050	52.10
NA	0.02114	0.05285	0.1057	0.5285	1.057	1.057	1.057	2.114	5.285	10.57	10.57	26.425	52.85
NA	0.02128	0.05320	0.1064	0.5320	1.064	1.064	1.064	2.128	5.320	10.64	10.64	26.600	53.20
NA	0.02050	0.05125	0.1025	0.5125	1.025	1.025	1.025	2.050	5.125	10.25	10.25	25.625	51.25
NA	0.02062	0.05155	0.1031	0.5155	1.031	1.031	1.031	2.062	5.155	10.31	10.31	25.775	51.55
NA	0.02106	0.05265	0.1053	0.5265	1.053	1.053	1.053	2.106	5.265	10.53	10.53	26.325	52.65
NA	0.02082	0.05205	0.1041	0.5205	1.041	1.041	1.041	2.082	5.205	10.41	10.41	26.025	52.05
NA	0.01964	0.04910	0.0982	0.4910	0.982	0.982	0.982	1.964	4.910	9.82	9.82	24.550	49.10
NA	0.02134	0.05335	0.1067	0.5335	1.067	1.067	1.067	2.134	5.335	10.67	10.67	26.675	53.35
NA	0.02128	0.05320	0.1064	0.5320	1.064	1.064	1.064	2.128	5.320	10.64	10.64	26.600	53.20

Method : I:\MS19\METHODS\S19031819.M (RTE Integrator)
Title : EPA T0-15 per SOP VOA-T015 (CASS T0-15/GC-MS)
Last Update : Tue Mar 19 08:07:16 2019
Response via : Initial Calibration

#	ID	Conc	ISTD Conc	Path\File

2	20	1000	1000	I:\MS19\DATA\2019_03\18\03181915.D
3	50	1000	1000	I:\MS19\DATA\2019_03\18\03181916.D
4	100	1000	1000	I:\MS19\DATA\2019_03\18\03181917.D
5	500	1000	1000	I:\MS19\DATA\2019_03\18\03181918.D
6	1000	1000	1000	I:\MS19\DATA\2019_03\18\03181919.D
7	2000	1000	1000	I:\MS19\DATA\2019_03\18\03181920.D
8	5000	1000	1000	I:\MS19\DATA\2019_03\18\03181921.D
9	10K	1000	1000	I:\MS19\DATA\2019_03\18\03181922.D
10	25K	1000	1000	I:\MS19\DATA\2019_03\18\03181923.D
11	50K	1000	1000	I:\MS19\DATA\2019_03\18\03181924.D

#	ID	Update Time	Quant Time	Acquisition Time

2	20	Mar 19 06:31 2019	Mar 19 06:20 2019	18 Mar 2019 16:35
3	50	Mar 19 06:31 2019	Mar 19 06:20 2019	18 Mar 2019 17:07
4	100	Mar 19 06:44 2019	Mar 19 06:20 2019	18 Mar 2019 17:38
5	500	Mar 19 06:31 2019	Mar 19 06:20 2019	18 Mar 2019 18:09
6	1000	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 18:41
7	2000	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 19:12
8	5000	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 19:43
9	10K	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 20:14
10	25K	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 20:46
11	50K	Mar 19 06:32 2019	Mar 19 06:20 2019	18 Mar 2019 21:17

S19031819.M Tue Mar 19 09:38:48 2019

TD 3/19/19

Data File : I:\MS19\DATA\2019 03\18\03181915.D
 Acq On : 18 Mar 2019 16:35
 Sample : 20pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:26 2019

TD 3/19/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21695	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	92821	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	11769	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25382	1134.986	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	113.50%	
33) Toluene-d8 (SS2)	14.01	98	98599	1075.247	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	107.53%	
45) Bromofluorobenzene (SS3)	17.43	174	43583	882.844	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	88.28%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.34	85	1212	31.789	pg	100
3) Chloromethane	4.56	52	281	41.764	pg	92
4) 1,2-Dichloro,1,1,2,2-t...	4.73	85	857	34.408	pg	100
5) Vinyl Chloride	4.86	62	754	37.848	pg	92
6) 1,3-Butadiene	5.05	54	615	43.857	pg	90
7) Bromomethane	5.37	94	564	34.478	pg	99
8) Chloroethane	5.60	64	370	33.902	pg	99
9) Acrolein	6.19	56	283	33.729	pg	92
10) Acetone	6.32	58	2816	288.914	pg	# 84
11) Trichlorofluoromethane	6.50	101	922	29.946	pg	98
12) 1,1-Dichloroethene	7.22	96	651	30.334	pg	94
13) Methylene Chloride	7.35	84	701	32.409	pg	91
14) Trichlorotrifluoroethane	7.67	151	644	28.595	pg	99
15) trans-1,2-Dichloroethene	8.39	96	639	28.135	pg	98
16) 1,1-Dichloroethane	8.59	63	951	31.093	pg	99
17) Methyl tert-Butyl Ether	8.70	73	1555	28.589	pg	98
18) cis-1,2-Dichloroethene	9.47	96	704	29.080	pg	93
19) Chloroform	9.76	83	1515	46.498	pg	100
21) 1,2-Dichloroethane	10.51	62	626	28.876	pg	94
22) 1,1,1-Trichloroethane	10.78	97	955	29.346	pg	100
23) Benzene	11.24	78	3343	40.824	pg	99
24) Carbon Tetrachloride	11.38	117	869	27.280	pg	99
26) 1,2-Dichloropropane	12.05	63	563	32.237	pg	99
27) Bromodichloromethane	12.23	83	758	28.767	pg	99
28) Trichloroethene	12.28	130	762	26.620	pg	97
29) 1,4-Dioxane	12.29	88	513	28.742	pg	98
30) cis-1,3-Dichloropropene	13.15	75	770	26.466	pg	99
31) trans-1,3-Dichloropropene	13.67	75	494	20.224	pg	# 86
32) 1,1,2-Trichloroethane	13.82	83	508	30.224	pg	99
34) Toluene	14.12	91	2741	30.542	pg	98
35) Dibromochloromethane	14.54	129	681	25.446	pg	99
36) 1,2-Dibromoethane	14.80	107	637	26.228	pg	100
37) Tetrachloroethene	15.27	166	861	26.319	pg	99
39) Chlorobenzene	15.97	112	1966	27.850	pg	98
40) Ethylbenzene	16.36	91	2606	23.940	pg	100
41) m,p-Xylene	16.54	91	3762	45.597	pg	100
42) Styrene	16.90	104	1033	15.894	pg	100
43) o-Xylene	17.00	106	1016	22.953	pg	99
44) 1,1,2,2-Tetrachloroethane	16.97	83	1081	26.994	pg	99
46) 1,3,5-Trimethylbenzene	18.27	105	2172	22.069	pg	97
47) 1,2,4-Trimethylbenzene	18.66	105	2028	21.169	pg	99
48) 1,3-Dichlorobenzene	18.82	146	1466	21.393	pg	100
49) 1,4-Dichlorobenzene	18.88	146	1640	23.038	pg	98
50) 1,2-Dichlorobenzene	19.20	146	1612	23.748	pg	100
51) 1,2-Dibromo-3-chloropr...	19.62	157	485	19.341	pg	98
52) 1,2,4-Trichlorobenzene	20.84	182	883	17.929	pg	99
53) Naphthalene	20.97	128	2362	16.849	pg	91

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Data File : I:\MS19\DATA\2019 03\18\03181915.D Vial: 13
Acq On : 18 Mar 2019 16:35 Operator: TD
Sample : 20pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131905 (4/11)

Quant Time: Mar 19 06:20:26 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	860	25.246	pg	99

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

Data File : I:\MS19\DATA\2019 03\18\03181915.D
Acq On : 18 Mar 2019 16:35
Sample : 20pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:26 2019

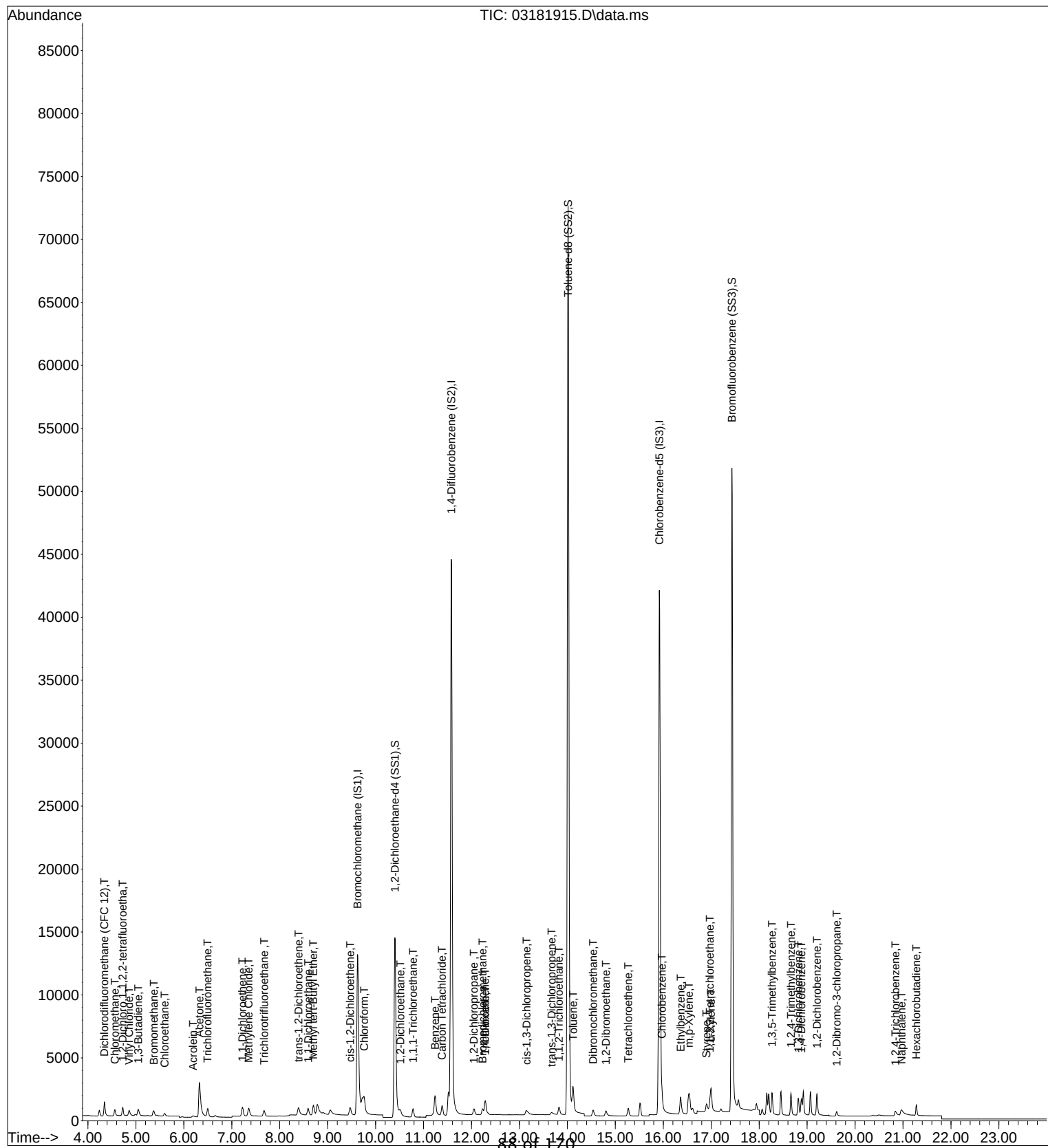
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181916.D
 Acq On : 18 Mar 2019 17:07
 Sample : 50pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:28 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21448	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	92902	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	11775	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25306	1144.619	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	114.46%	
33) Toluene-d8 (SS2)	14.01	98	98042	1068.240	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	106.82%	
45) Bromofluorobenzene (SS3)	17.43	174	43978	890.391	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	89.04%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.34	85	2584	68.554	pg	100
3) Chloromethane	4.56	52	556	83.587	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.73	85	1825	74.116	pg	100
5) Vinyl Chloride	4.86	62	1626	82.558	pg	100
6) 1,3-Butadiene	5.04	54	1196	86.272	pg	95
7) Bromomethane	5.36	94	1105	68.328	pg	100
8) Chloroethane	5.59	64	770	71.366	pg	100
9) Acrolein	6.17	56	601	72.454	pg	97
10) Acetone	6.31	58	5320	552.104	pg	# 86
11) Trichlorofluoromethane	6.50	101	1957	64.295	pg	100
12) 1,1-Dichloroethene	7.22	96	1349	63.582	pg	96
13) Methylene Chloride	7.35	84	1447	67.669	pg	92
14) Trichlorotrifluoroethane	7.67	151	1368	61.441	pg	99
15) trans-1,2-Dichloroethene	8.39	96	1408	62.708	pg	99
16) 1,1-Dichloroethane	8.59	63	1992	65.879	pg	99
17) Methyl tert-Butyl Ether	8.70	73	3335	62.021	pg	98
18) cis-1,2-Dichloroethene	9.47	96	1472	61.503	pg	98
19) Chloroform	9.76	83	2619	81.307	pg	99
21) 1,2-Dichloroethane	10.51	62	1399	65.275	pg	98
22) 1,1,1-Trichloroethane	10.78	97	2024	62.912	pg	100
23) Benzene	11.24	78	6149	75.956	pg	99
24) Carbon Tetrachloride	11.39	117	1811	57.507	pg	100
26) 1,2-Dichloropropane	12.05	63	1225	70.082	pg	98
27) Bromodichloromethane	12.23	83	1664	63.095	pg	99
28) Trichloroethene	12.28	130	1668	58.219	pg	99
29) 1,4-Dioxane	12.28	88	1103	61.745	pg	92
30) cis-1,3-Dichloropropene	13.14	75	1741	59.788	pg	99
31) trans-1,3-Dichloropropene	13.66	75	1154	47.202	pg	99
32) 1,1,2-Trichloroethane	13.82	83	1114	66.220	pg	100
34) Toluene	14.12	91	5947	66.209	pg	100
35) Dibromochloromethane	14.53	129	1477	55.142	pg	100
36) 1,2-Dibromoethane	14.80	107	1400	57.594	pg	98
37) Tetrachloroethene	15.27	166	1849	56.470	pg	100
39) Chlorobenzene	15.97	112	4181	59.197	pg	99
40) Ethylbenzene	16.36	91	5649	51.867	pg	100
41) m,p-Xylene	16.53	91	8519	103.202	pg	98
42) Styrene	16.89	104	2517	38.707	pg	100
43) o-Xylene	17.00	106	2288	51.664	pg	100
44) 1,1,2,2-Tetrachloroethane	16.97	83	2332	58.203	pg	99
46) 1,3,5-Trimethylbenzene	18.27	105	4933	50.097	pg	99
47) 1,2,4-Trimethylbenzene	18.66	105	4792	49.996	pg	99
48) 1,3-Dichlorobenzene	18.81	146	3394	49.503	pg	99
49) 1,4-Dichlorobenzene	18.88	146	3601	50.560	pg	100
50) 1,2-Dichlorobenzene	19.20	146	3618	53.274	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	1070	42.648	pg	99
52) 1,2,4-Trichlorobenzene	20.83	182	2083	42.274	pg	99
53) Naphthalene	20.95	128	5388	38.414	pg	97

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Data File : I:\MS19\DATA\2019 03\18\03181916.D Vial: 13
Acq On : 18 Mar 2019 17:07 Operator: TD
Sample : 50pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131905 (4/11)

Quant Time: Mar 19 06:20:28 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

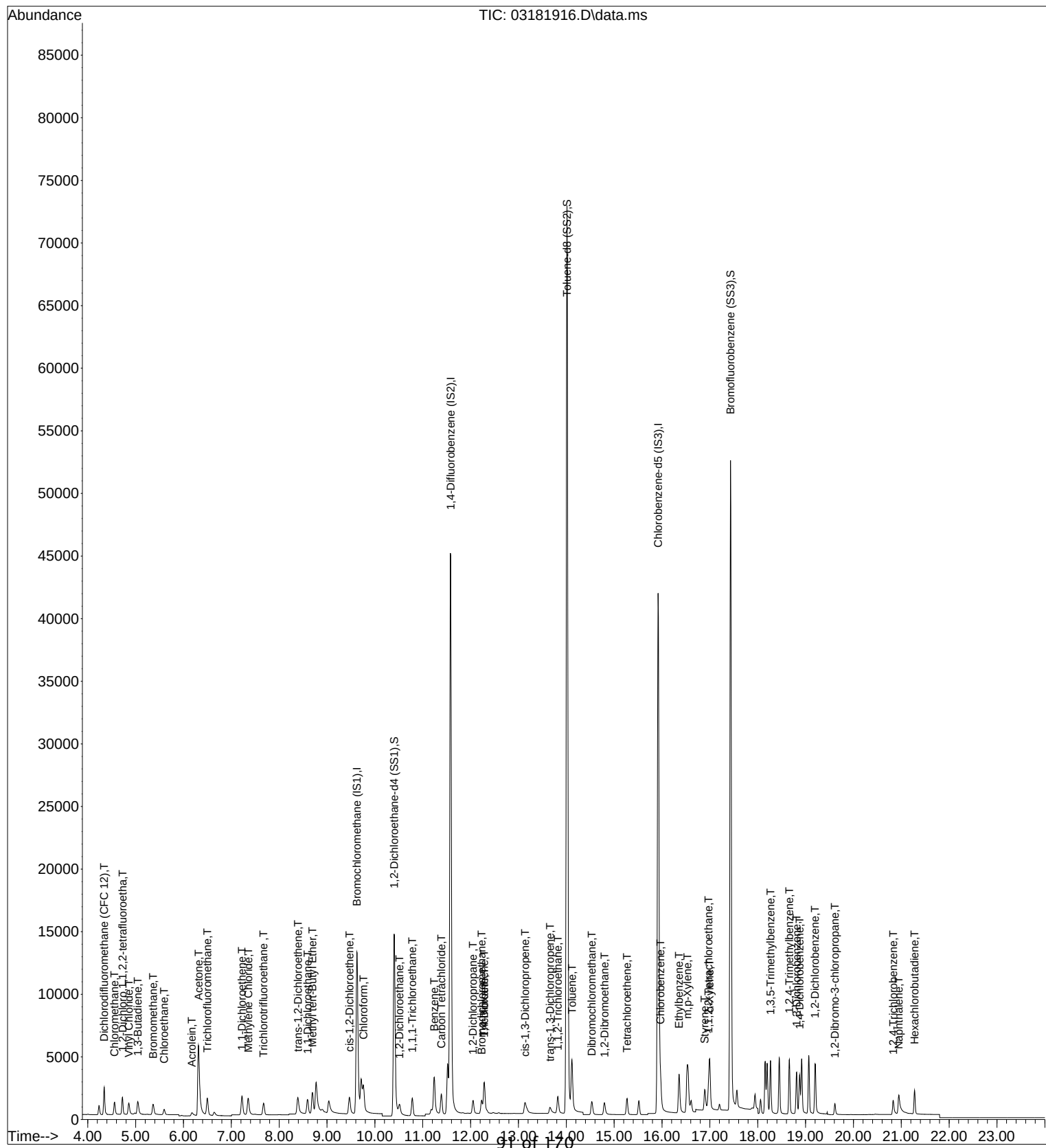
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	1916	56.216	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181916.D
Acq On : 18 Mar 2019 17:07
Sample : 50pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:28 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181917.D
 Acq On : 18 Mar 2019 17:38
 Sample : 100pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:29 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21987	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	96281	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	12087	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25981	1146.342	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	114.63%	
33) Toluene-d8 (SS2)	14.02	98	100849	1060.261	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	106.03%	
45) Bromofluorobenzene (SS3)	17.43	174	46396	915.099	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	91.51%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.34	85	4877	126.216	pg	100
3) Chloromethane	4.55	52	1007	147.678	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.72	85	3412	135.170	pg	100
5) Vinyl Chloride	4.85	62	2998	148.488	pg	98
6) 1,3-Butadiene	5.04	54	2115	148.823	pg	93
7) Bromomethane	5.36	94	2079	125.403	pg	100
8) Chloroethane	5.59	64	1464	132.362	pg	100
9) Acrolein	6.16	56	1142	134.301	pg	100
10) Acetone	6.30	58	9767	988.760	pg	# 84
11) Trichlorofluoromethane	6.50	101	3690	118.258	pg	100
12) 1,1-Dichloroethene	7.22	96	2577	118.484	pg	96
13) Methylene Chloride	7.35	84	2727	124.402	pg	91
14) Trichlorotrifluoroethane	7.67	151	2552	111.808	pg	100
15) trans-1,2-Dichloroethene	8.39	96	2727	118.476	pg	98
16) 1,1-Dichloroethane	8.59	63	3867	124.753	pg	100
17) Methyl tert-Butyl Ether	8.68	73	6396	116.031	pg	98
18) cis-1,2-Dichloroethene	9.47	96	2813	114.652	pg	99
19) Chloroform	9.76	83	4602	139.367	pg	100
21) 1,2-Dichloroethane	10.51	62	2684	122.162	pg	97
22) 1,1,1-Trichloroethane	10.78	97	3821	115.856	pg	100
23) Benzene	11.24	78	11172	134.620	pg	99
24) Carbon Tetrachloride	11.39	117	3410	105.627	pg	100
26) 1,2-Dichloropropane	12.05	63	2341	129.229	pg	99
27) Bromodichloromethane	12.23	83	3153	115.358	pg	99
28) Trichloroethene	12.28	130	3173	106.862	pg	100
29) 1,4-Dioxane	12.27	88	2191	118.346	pg	92
30) cis-1,3-Dichloropropene	13.13	75	3397	112.563	pg	100
31) trans-1,3-Dichloropropene	13.65	75	2397	94.603	pg	99
32) 1,1,2-Trichloroethane	13.82	83	2129	122.114	pg	99
34) Toluene	14.11	91	11234	120.680	pg	100
35) Dibromochloromethane	14.53	129	2906	104.684	pg	100
36) 1,2-Dibromoethane	14.79	107	2785	110.550	pg	98
37) Tetrachloroethene	15.27	166	3518	103.672	pg	100
39) Chlorobenzene	15.96	112	7973	109.973	pg	100
40) Ethylbenzene	16.35	91	11074	99.054	pg	100
41) m,p-Xylene	16.53	91	17186	202.823	pg	98
42) Styrene	16.89	104	5647	84.598	pg	100
43) o-Xylene	17.00	106	4618	101.584	pg	99
44) 1,1,2,2-Tetrachloroethane	16.97	83	4597	111.772	pg	100
46) 1,3,5-Trimethylbenzene	18.27	105	10232	101.229	pg	99
47) 1,2,4-Trimethylbenzene	18.66	105	10077	102.422	pg	100
48) 1,3-Dichlorobenzene	18.81	146	6840	97.189	pg	99
49) 1,4-Dichlorobenzene	18.87	146	7113	97.293	pg	100
50) 1,2-Dichlorobenzene	19.20	146	7108	101.962	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	2193	85.153	pg	99
52) 1,2,4-Trichlorobenzene	20.83	182	4169	82.424	pg	99
53) Naphthalene	20.94	128	11090	77.027	pg	98

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Data File : I:\MS19\DATA\2019 03\18\03181917.D Vial: 13
Acq On : 18 Mar 2019 17:38 Operator: TD
Sample : 100pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131905 (4/11)

Quant Time: Mar 19 06:20:29 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	3647	104.242	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181917.D
Acq On : 18 Mar 2019 17:38
Sample : 100pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:29 2019

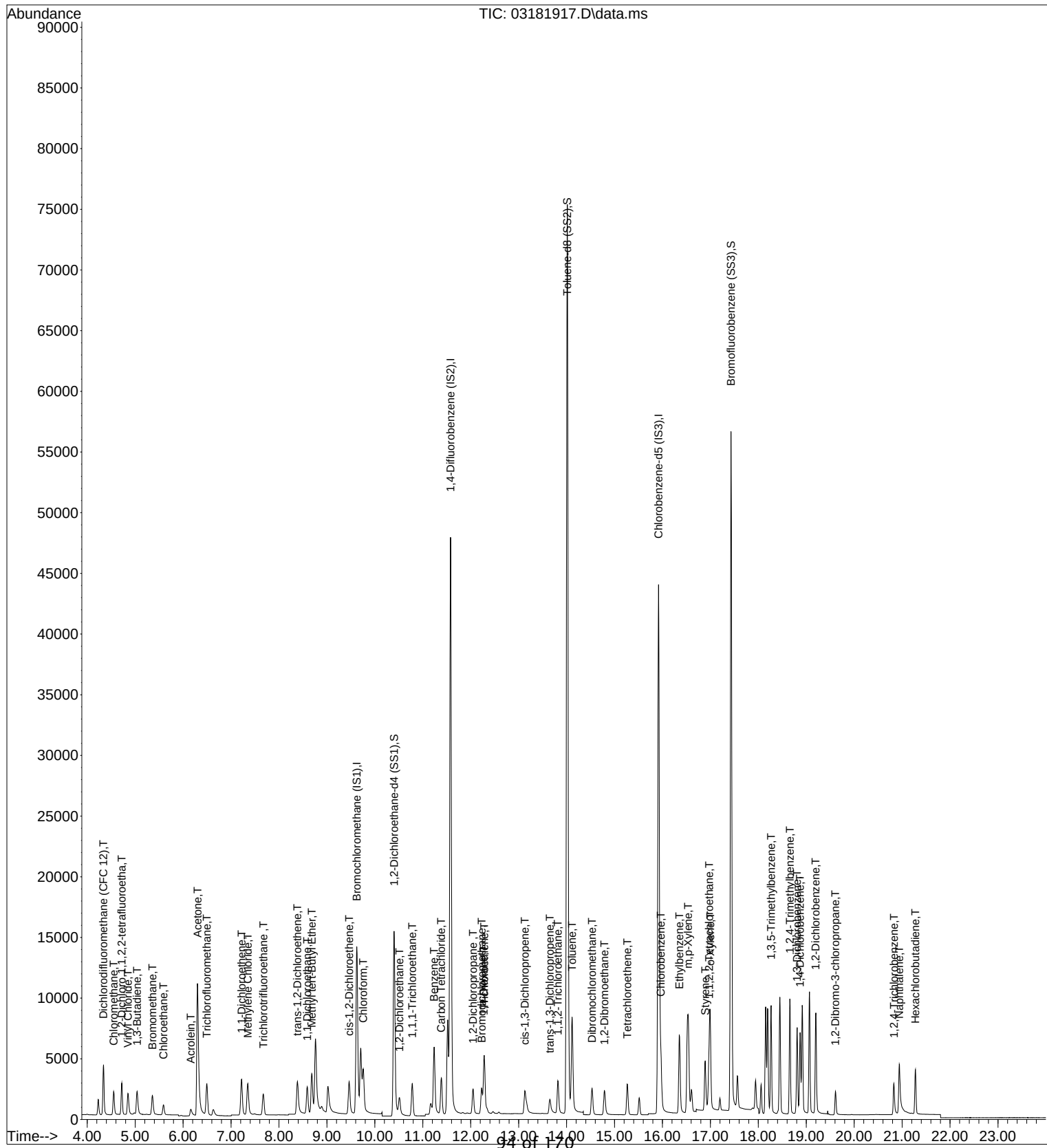
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181918.D
 Acq On : 18 Mar 2019 18:09
 Sample : 500pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:30 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	21242	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	97598	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12090	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25032	1143.206	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	114.32%	
33) Toluene-d8 (SS2)	14.02	98	101158	1049.159	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.92%	
45) Bromofluorobenzene (SS3)	17.43	174	47712	940.822	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	94.08%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.33	85	22936	614.398	pg	100
3) Chloromethane	4.53	52	4355	661.066	pg	98
4) 1,2-Dichloro,1,1,2,2-t...	4.71	85	16053	658.263	pg	100
5) Vinyl Chloride	4.83	62	14367	736.541	pg	100
6) 1,3-Butadiene	5.02	54	9400	684.633	pg	92
7) Bromomethane	5.34	94	9503	593.315	pg	100
8) Chloroethane	5.57	64	6999	654.983	pg	99
9) Acrolein	6.13	56	5528	672.900	pg	98
10) Acetone	6.27	58	41906	4391.132	pg	# 87
11) Trichlorofluoromethane	6.49	101	17338	575.141	pg	100
12) 1,1-Dichloroethene	7.21	96	12419	591.021	pg	97
13) Methylene Chloride	7.34	84	13003	613.984	pg	91
14) Trichlorotrifluoroethane	7.66	151	10646	482.778	pg	100
15) trans-1,2-Dichloroethene	8.37	96	13336	599.708	pg	98
16) 1,1-Dichloroethane	8.58	63	18257	609.643	pg	100
17) Methyl tert-Butyl Ether	8.66	73	32383	608.069	pg	98
18) cis-1,2-Dichloroethene	9.46	96	14032	591.971	pg	100
19) Chloroform	9.76	83	20841	653.286	pg	100
21) 1,2-Dichloroethane	10.51	62	13193	621.536	pg	99
22) 1,1,1-Trichloroethane	10.78	97	18426	578.285	pg	100
23) Benzene	11.23	78	51444	641.628	pg	99
24) Carbon Tetrachloride	11.39	117	16607	532.455	pg	100
26) 1,2-Dichloropropane	12.05	63	11655	634.701	pg	99
27) Bromodichloromethane	12.22	83	15785	569.728	pg	100
28) Trichloroethene	12.28	130	15835	526.102	pg	100
29) 1,4-Dioxane	12.25	88	11361	605.380	pg	94
30) cis-1,3-Dichloropropene	13.12	75	18538	605.987	pg	100
31) trans-1,3-Dichloropropene	13.64	75	14452	562.687	pg	100
32) 1,1,2-Trichloroethane	13.81	83	10694	605.106	pg	99
34) Toluene	14.11	91	55803	591.369	pg	100
35) Dibromochloromethane	14.53	129	14609	519.162	pg	100
36) 1,2-Dibromoethane	14.79	107	14468	566.553	pg	100
37) Tetrachloroethene	15.27	166	17232	500.957	pg	100
39) Chlorobenzene	15.96	112	39338	542.459	pg	100
40) Ethylbenzene	16.35	91	59268	530.003	pg	100
41) m,p-Xylene	16.53	91	93919	1108.124	pg	100
42) Styrene	16.88	104	34976	523.850	pg	100
43) o-Xylene	17.00	106	25299	556.375	pg	100
44) 1,1,2,2-Tetrachloroethane	16.96	83	23641	574.667	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	56869	562.486	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	57636	585.664	pg	100
48) 1,3-Dichlorobenzene	18.80	146	36577	519.590	pg	100
49) 1,4-Dichlorobenzene	18.87	146	36802	503.260	pg	100
50) 1,2-Dichlorobenzene	19.20	146	37139	532.613	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	12530	486.410	pg	97
52) 1,2,4-Trichlorobenzene	20.82	182	23055	455.702	pg	99
53) Naphthalene	20.94	128	68608	476.405	pg	100

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Data File : I:\MS19\DATA\2019 03\18\03181918.D Vial: 13
Acq On : 18 Mar 2019 18:09 Operator: TD
Sample : 500pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131905 (4/11)

Quant Time: Mar 19 06:20:30 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	18325	523.654	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181918.D
Acq On : 18 Mar 2019 18:09
Sample : 500pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131905 (4/11)

Vial: 13
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:30 2019

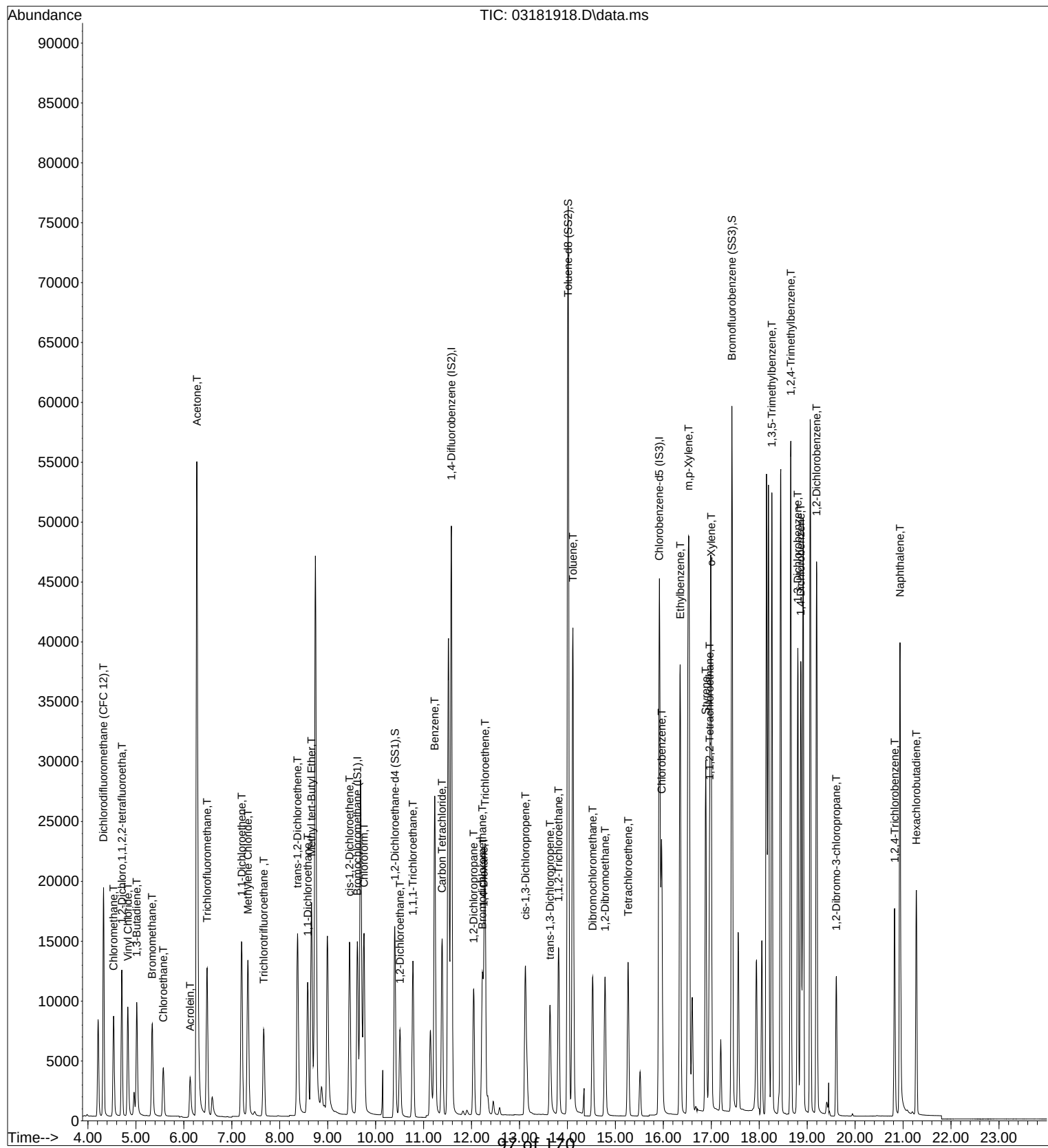
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181919.D
 Acq On : 18 Mar 2019 18:41
 Sample : 1000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:31 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

TD 3/19/19

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	22839	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	103218	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12740	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	26473	1124.476	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	112.45%	
33) Toluene-d8 (SS2)	14.02	98	106578	1045.187	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.52%	
45) Bromofluorobenzene (SS3)	17.43	174	50514	945.254	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	94.53%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	53263	1327.015	pg	100
3) Chloromethane	4.53	52	11167	1576.563	pg	98
4) 1,2-Dichloro,1,1,2,2-t...	4.70	85	37200	1418.745	pg	100
5) Vinyl Chloride	4.83	62	33399	1592.513	pg	100
6) 1,3-Butadiene	5.01	54	23811	1612.970	pg	91
7) Bromomethane	5.34	94	22192	1288.664	pg	100
8) Chloroethane	5.56	64	16219	1411.680	pg	100
9) Acrolein	6.12	56	12054	1364.683	pg	99
10) Acetone	6.26	58	79734	7770.737	pg	91
11) Trichlorofluoromethane	6.48	101	40372	1245.586	pg	100
12) 1,1-Dichloroethene	7.20	96	29326	1298.038	pg	97
13) Methylene Chloride	7.33	84	29826	1309.865	pg	90
14) Trichlorotrifluoroethane	7.67	151	28484	1201.380	pg	100
15) trans-1,2-Dichloroethene	8.37	96	31530	1318.732	pg	99
16) 1,1-Dichloroethane	8.58	63	43999	1366.493	pg	100
17) Methyl tert-Butyl Ether	8.66	73	79702	1391.949	pg	98
18) cis-1,2-Dichloroethene	9.46	96	33032	1296.087	pg	100
19) Chloroform	9.76	83	48962	1427.454	pg	100
21) 1,2-Dichloroethane	10.51	62	30905	1354.159	pg	100
22) 1,1,1-Trichloroethane	10.78	97	43779	1277.895	pg	100
23) Benzene	11.23	78	117941	1368.143	pg	99
24) Carbon Tetrachloride	11.39	117	39132	1166.922	pg	100
26) 1,2-Dichloropropane	12.05	63	27227	1401.982	pg	99
27) Bromodichloromethane	12.22	83	37261	1271.637	pg	100
28) Trichloroethene	12.28	130	37221	1169.298	pg	100
29) 1,4-Dioxane	12.25	88	26029	1311.457	pg	94
30) cis-1,3-Dichloropropene	13.12	75	44749	1383.150	pg	100
31) trans-1,3-Dichloropropene	13.63	75	35033	1289.738	pg	99
32) 1,1,2-Trichloroethane	13.81	83	24827	1328.315	pg	99
34) Toluene	14.11	91	126579	1268.376	pg	100
35) Dibromochloromethane	14.53	129	34915	1173.222	pg	100
36) 1,2-Dibromoethane	14.78	107	33877	1254.361	pg	100
37) Tetrachloroethene	15.27	166	39377	1082.413	pg	100
39) Chlorobenzene	15.96	112	89306	1168.671	pg	100
40) Ethylbenzene	16.35	91	137122	1163.649	pg	100
41) m,p-Xylene	16.53	91	215893	2417.299	pg	100
42) Styrene	16.88	104	83560	1187.659	pg	100
43) o-Xylene	16.99	106	56868	1186.832	pg	100
44) 1,1,2,2-Tetrachloroethane	16.96	83	53112	1225.179	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	123716	1161.232	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	124521	1200.754	pg	100
48) 1,3-Dichlorobenzene	18.80	146	80212	1081.306	pg	100
49) 1,4-Dichlorobenzene	18.87	146	81221	1054.014	pg	100
50) 1,2-Dichlorobenzene	19.20	146	78353	1066.337	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	26212	965.625	pg	96
52) 1,2,4-Trichlorobenzene	20.82	182	51862	972.796	pg	99
53) Naphthalene	20.93	128	168890	1112.916	pg	100

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Data File : I:\MS19\DATA\2019 03\18\03181919.D Vial: 14
Acq On : 18 Mar 2019 18:41 Operator: TD
Sample : 1000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Mar 19 06:20:31 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

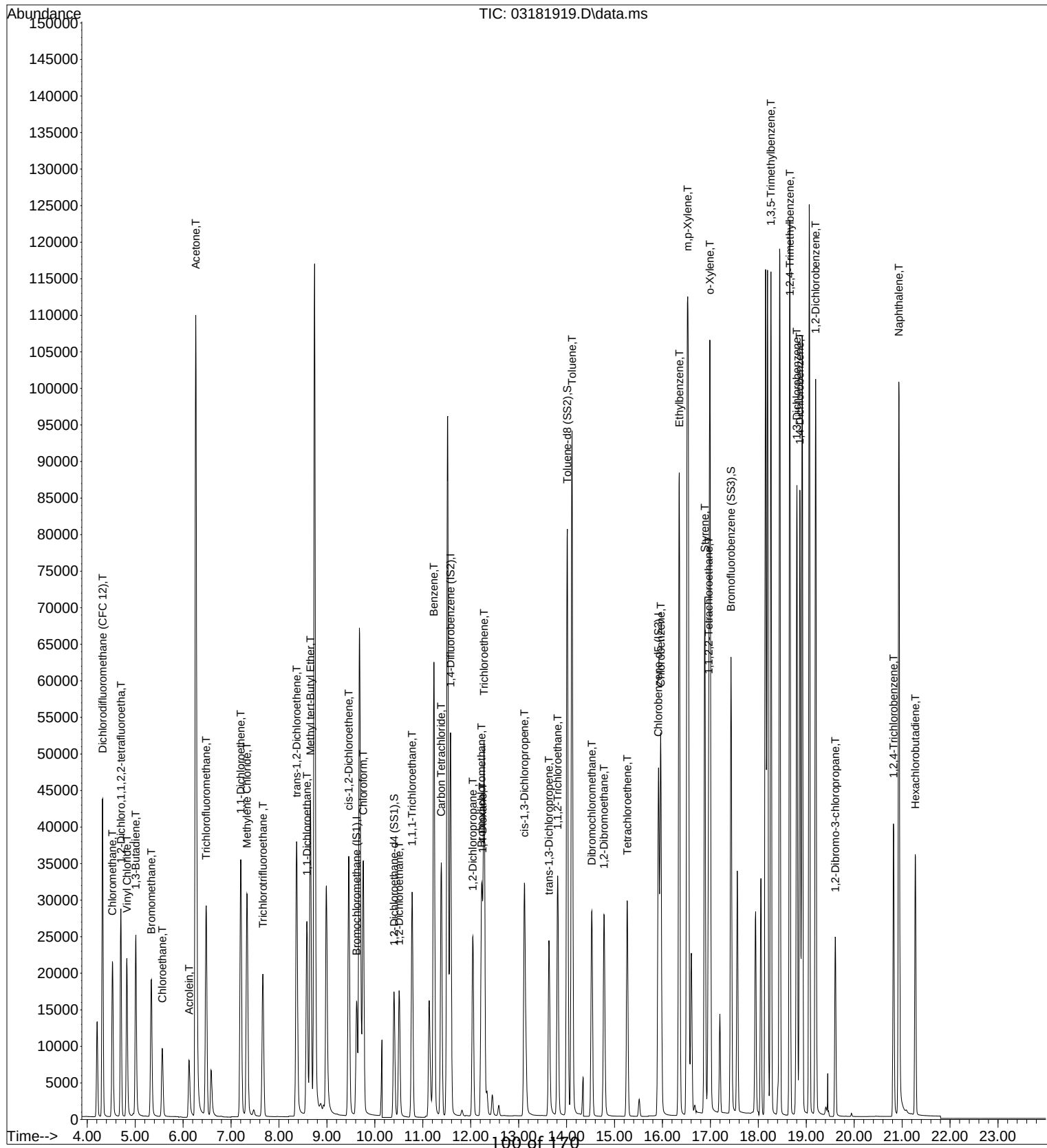
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	34733	941.889	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181919.D
Acq On : 18 Mar 2019 18:41
Sample : 1000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:31 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181920.D
 Acq On : 18 Mar 2019 19:12
 Sample : 2000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:32 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	23504	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	106836	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	13039	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	27321	1127.662	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	112.77%	
33) Toluene-d8 (SS2)	14.02	98	110200	1044.109	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.41%	
45) Bromofluorobenzene (SS3)	17.43	174	51753	946.232	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	94.62%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	100413	2430.948	pg	100
3) Chloromethane	4.52	52	21031	2885.161	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	70693	2619.830	pg	100
5) Vinyl Chloride	4.82	62	63106	2923.852	pg	100
6) 1,3-Butadiene	5.00	54	50025	3292.842	pg	92
7) Bromomethane	5.33	94	42271	2385.179	pg	100
8) Chloroethane	5.56	64	31034	2624.734	pg	100
9) Acrolein	6.12	56	23749	2612.650	pg	99
10) Acetone	6.26	58	152345	14427.203	pg	91
11) Trichlorofluoromethane	6.48	101	77793	2332.219	pg	100
12) 1,1-Dichloroethene	7.20	96	57118	2456.648	pg	96
13) Methylene Chloride	7.34	84	57885	2470.205	pg	90
14) Trichlorotrifluoroethane	7.67	151	53004	2172.318	pg	100
15) trans-1,2-Dichloroethene	8.37	96	60774	2469.935	pg	100
16) 1,1-Dichloroethane	8.58	63	84532	2551.061	pg	100
17) Methyl tert-Butyl Ether	8.65	73	156184	2650.489	pg	98
18) cis-1,2-Dichloroethene	9.46	96	64671	2465.722	pg	100
19) Chloroform	9.76	83	93717	2654.952	pg	100
21) 1,2-Dichloroethane	10.51	62	59469	2532.019	pg	100
22) 1,1,1-Trichloroethane	10.78	97	84332	2391.977	pg	100
23) Benzene	11.23	78	226718	2555.571	pg	99
24) Carbon Tetrachloride	11.39	117	75624	2191.314	pg	100
26) 1,2-Dichloropropane	12.05	63	52325	2603.093	pg	99
27) Bromodichloromethane	12.22	83	72361	2385.893	pg	100
28) Trichloroethene	12.28	130	71771	2178.331	pg	100
29) 1,4-Dioxane	12.25	88	50690	2467.498	pg	94
30) cis-1,3-Dichloropropene	13.12	75	89574	2674.889	pg	100
31) trans-1,3-Dichloropropene	13.63	75	71577	2545.865	pg	99
32) 1,1,2-Trichloroethane	13.81	83	47777	2469.639	pg	99
34) Toluene	14.11	91	245140	2373.221	pg	100
35) Dibromochloromethane	14.53	129	68207	2214.293	pg	100
36) 1,2-Dibromoethane	14.78	107	66176	2367.315	pg	100
37) Tetrachloroethene	15.27	166	75519	2005.601	pg	100
39) Chlorobenzene	15.96	112	172903	2210.749	pg	100
40) Ethylbenzene	16.35	91	271018	2247.181	pg	100
41) m,p-Xylene	16.53	91	422689	4624.214	pg	100
42) Styrene	16.88	104	170842	2372.538	pg	100
43) o-Xylene	17.00	106	111051	2264.483	pg	100
44) 1,1,2,2-Tetrachloroethane	16.96	83	102892	2319.069	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	241096	2211.099	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	243595	2295.118	pg	100
48) 1,3-Dichlorobenzene	18.80	146	156220	2057.648	pg	100
49) 1,4-Dichlorobenzene	18.87	146	158403	2008.475	pg	100
50) 1,2-Dichlorobenzene	19.20	146	152159	2023.306	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	52758	1898.986	pg	95
52) 1,2,4-Trichlorobenzene	20.82	182	103662	1899.841	pg	99
53) Naphthalene	20.93	128	339863	2188.202	pg	100

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Data File : I:\MS19\DATA\2019 03\18\03181920.D Vial: 14
Acq On : 18 Mar 2019 19:12 Operator: TD
Sample : 2000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Mar 19 06:20:32 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	67705	1793.922	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181920.D
Acq On : 18 Mar 2019 19:12
Sample : 2000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:32 2019

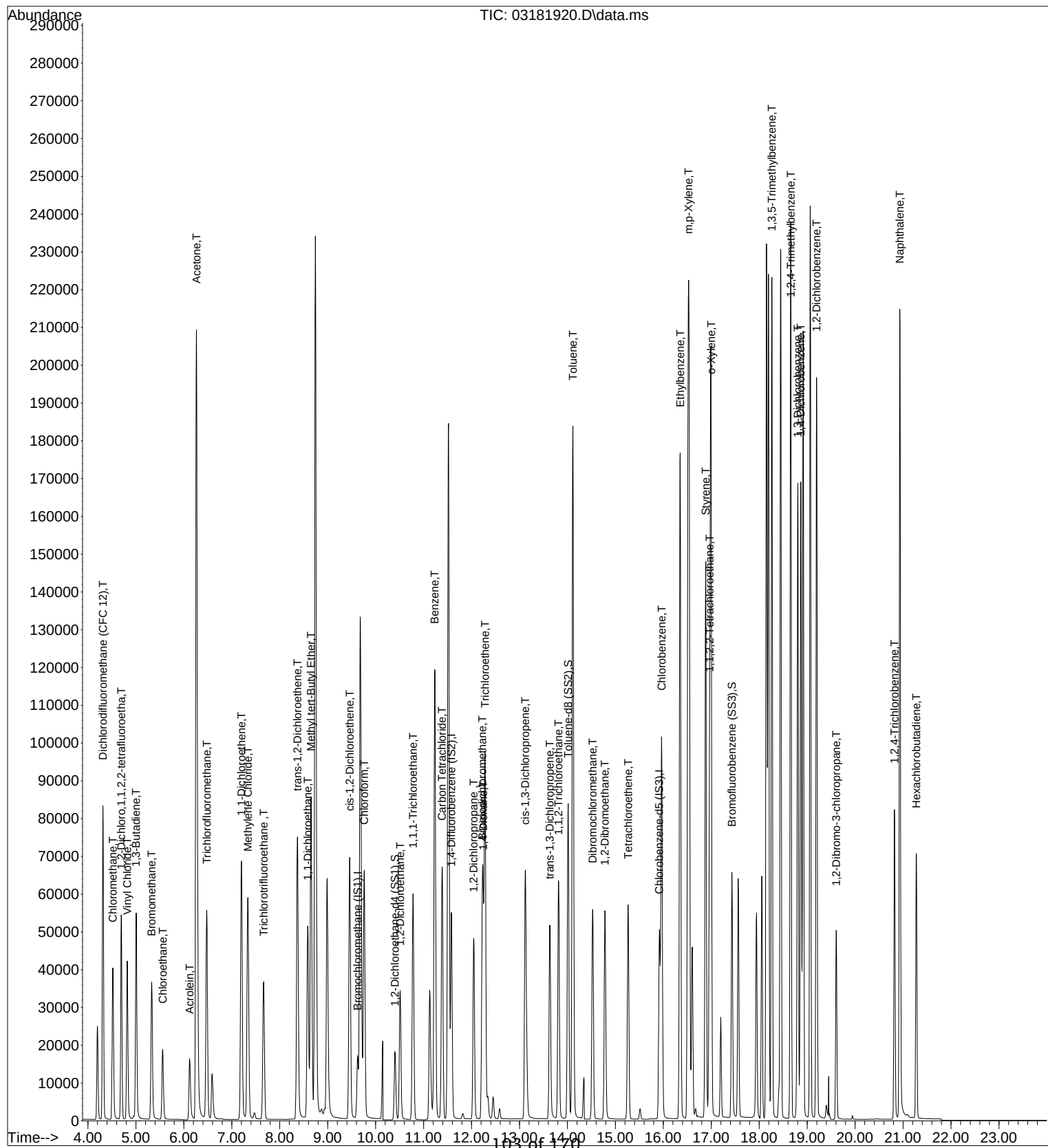
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181921.D
 Acq On : 18 Mar 2019 19:43
 Sample : 5000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:33 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.63	130	23909	1000.000	pg	0.01
25) 1,4-Difluorobenzene (IS2)	11.58	114	110189	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	13667	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.41	65	27982	1135.381	pg	0.01
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	113.54%	
33) Toluene-d8 (SS2)	14.02	98	113515	1042.790	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.28%	
45) Bromofluorobenzene (SS3)	17.43	174	54161	944.756	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	94.48%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	237321	5648.098	pg	100
3) Chloromethane	4.51	52	49772	6712.366	pg	98
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	167946	6118.525	pg	100
5) Vinyl Chloride	4.81	62	150187	6840.651	pg	100
6) 1,3-Butadiene	5.00	54	105552	6830.157	pg	91
7) Bromomethane	5.32	94	101137	5610.077	pg	100
8) Chloroethane	5.56	64	74908	6228.107	pg	99
9) Acrolein	6.12	56	57940	6266.062	pg	99
10) Acetone	6.27	58	365260	34004.503	pg	90
11) Trichlorofluoromethane	6.47	101	188094	5543.500	pg	100
12) 1,1-Dichloroethene	7.20	96	139645	5904.400	pg	96
13) Methylene Chloride	7.34	84	140479	5893.302	pg	91
14) Trichlorotrifluoroethane	7.66	151	124384	5011.407	pg	100
15) trans-1,2-Dichloroethene	8.38	96	148886	5948.425	pg	100
16) 1,1-Dichloroethane	8.59	63	203736	6044.327	pg	100
17) Methyl tert-Butyl Ether	8.65	73	385972	6439.107	pg	98
18) cis-1,2-Dichloroethene	9.47	96	158348	5935.094	pg	100
19) Chloroform	9.77	83	227498	6335.724	pg	100
21) 1,2-Dichloroethane	10.52	62	144189	6035.159	pg	100
22) 1,1,1-Trichloroethane	10.78	97	205320	5725.011	pg	100
23) Benzene	11.24	78	547386	6065.632	pg	100
24) Carbon Tetrachloride	11.39	117	185075	5271.972	pg	100
26) 1,2-Dichloropropane	12.05	63	127657	6157.499	pg	100
27) Bromodichloromethane	12.23	83	178058	5692.294	pg	100
28) Trichloroethene	12.28	130	174812	5144.291	pg	100
29) 1,4-Dioxane	12.25	88	125045	5901.743	pg	94
30) cis-1,3-Dichloropropene	13.12	75	225649	6533.359	pg	100
31) trans-1,3-Dichloropropene	13.63	75	185816	6408.028	pg	99
32) 1,1,2-Trichloroethane	13.81	83	116429	5835.191	pg	98
34) Toluene	14.11	91	595791	5592.389	pg	99
35) Dibromochloromethane	14.53	129	168433	5301.669	pg	100
36) 1,2-Dibromoethane	14.79	107	163511	5671.290	pg	100
37) Tetrachloroethene	15.27	166	182354	4695.512	pg	100
39) Chlorobenzene	15.96	112	420281	5126.815	pg	100
40) Ethylbenzene	16.35	91	666814	5274.918	pg	99
41) m,p-Xylene	16.53	91	1033482	10786.760	pg	100
42) Styrene	16.88	104	430690	5706.298	pg	100
43) o-Xylene	17.00	106	270376	5260.000	pg	99
44) 1,1,2,2-Tetrachloroethane	16.96	83	249952	5374.769	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	588005	5144.820	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	592974	5330.199	pg	100
48) 1,3-Dichlorobenzene	18.80	146	381112	4789.148	pg	100
49) 1,4-Dichlorobenzene	18.87	146	387693	4689.885	pg	99
50) 1,2-Dichlorobenzene	19.20	146	370259	4697.216	pg	100
51) 1,2-Dibromo-3-chloropr...	19.60	157	133011	4567.643	pg	94
52) 1,2,4-Trichlorobenzene	20.82	182	259935	4544.995	pg	99
53) Naphthalene	20.93	128	852824	5238.585	pg	99

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Data File : I:\MS19\DATA\2019 03\18\03181921.D Vial: 14
Acq On : 18 Mar 2019 19:43 Operator: TD
Sample : 5000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Mar 19 06:20:33 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	165371	4180.356	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181921.D
Acq On : 18 Mar 2019 19:43
Sample : 5000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:33 2019

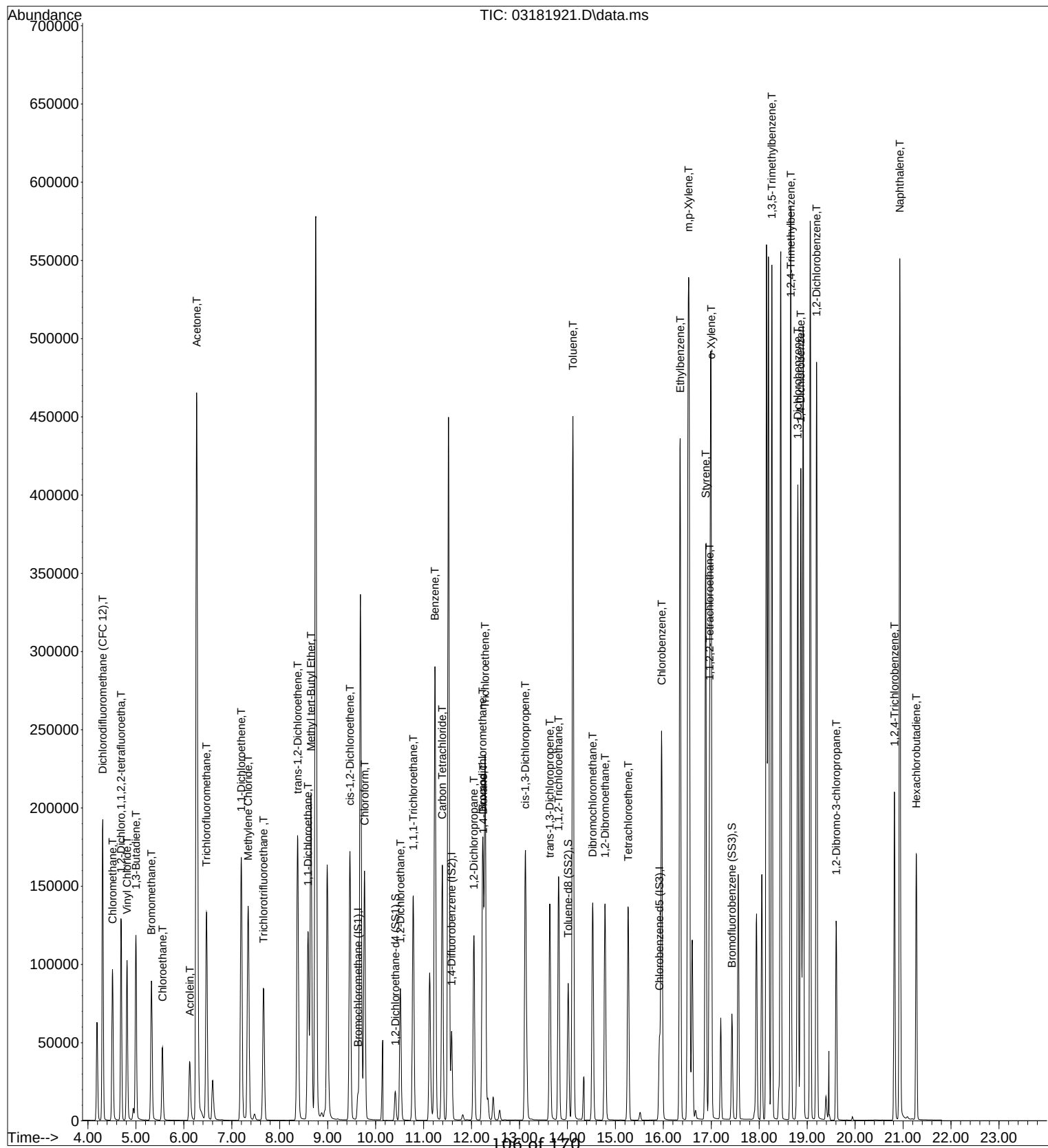
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181922.D
 Acq On : 18 Mar 2019 20:14
 Sample : 10000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:34 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.64	130	23938	1000.000	pg	0.02
25) 1,4-Difluorobenzene (IS2)	11.59	114	110417	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	14135	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.41	65	27841	1128.291	pg	0.01
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	112.83%	
33) Toluene-d8 (SS2)	14.02	98	114280	1047.650	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.77%	
45) Bromofluorobenzene (SS3)	17.43	174	55519	936.380	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	93.64%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.30	85	465068	11054.931	pg	100
3) Chloromethane	4.51	52	92292	12431.633	pg	98
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	330816	12037.523	pg	100
5) Vinyl Chloride	4.81	62	296970	13509.872	pg	100
6) 1,3-Butadiene	5.00	54	210213	13586.179	pg	91
7) Bromomethane	5.32	94	201422	11159.358	pg	100
8) Chloroethane	5.55	64	150084	12463.378	pg	100
9) Acrolein	6.12	56	115091	12431.718	pg	99
10) Acetone	6.27	58	710766	66089.811	pg	89
11) Trichlorofluoromethane	6.47	101	376839	11092.731	pg	100
12) 1,1-Dichloroethene	7.19	96	279454	11801.420	pg	95
13) Methylene Chloride	7.35	84	279974	11731.094	pg	91
14) Trichlorotrifluoroethane	7.66	151	240895	9693.854	pg	100
15) trans-1,2-Dichloroethene	8.38	96	297757	11881.838	pg	100
16) 1,1-Dichloroethane	8.59	63	402260	11919.569	pg	100
17) Methyl tert-Butyl Ether	8.65	73	769485	12821.639	pg	98
18) cis-1,2-Dichloroethene	9.47	96	313980	11754.131	pg	100
19) Chloroform	9.77	83	450736	12537.602	pg	99
21) 1,2-Dichloroethane	10.52	62	285222	11923.759	pg	100
22) 1,1,1-Trichloroethane	10.78	97	406538	11321.911	pg	100
23) Benzene	11.24	78	1083968	11996.992	pg	100
24) Carbon Tetrachloride	11.39	117	370210	10532.878	pg	100
26) 1,2-Dichloropropane	12.05	63	252594	12158.642	pg	100
27) Bromodichloromethane	12.23	83	355728	11348.702	pg	100
28) Trichloroethene	12.29	130	348169	10224.607	pg	100
29) 1,4-Dioxane	12.25	88	249290	11741.433	pg	94
30) cis-1,3-Dichloropropene	13.12	75	455833	13170.771	pg	100
31) trans-1,3-Dichloropropene	13.63	75	380342	13089.344	pg	100
32) 1,1,2-Trichloroethane	13.82	83	231387	11572.712	pg	98
34) Toluene	14.11	91	1184538	11095.700	pg	99
35) Dibromochloromethane	14.53	129	338465	10631.671	pg	100
36) 1,2-Dibromoethane	14.78	107	326866	11313.759	pg	100
37) Tetrachloroethene	15.27	166	361672	9293.618	pg	100
39) Chlorobenzene	15.96	112	834756	9845.660	pg	100
40) Ethylbenzene	16.35	91	1325651	10139.524	pg	99
41) m,p-Xylene	16.53	91	2057952	20768.288	pg	100
42) Styrene	16.89	104	865514	11087.691	pg	100
43) o-Xylene	17.00	106	539311	10144.584	pg	98
44) 1,1,2,2-Tetrachloroethane	16.97	83	496261	10317.887	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	1170786	9904.763	pg	99
47) 1,2,4-Trimethylbenzene	18.66	105	1173912	10202.832	pg	100
48) 1,3-Dichlorobenzene	18.81	146	759948	9233.511	pg	100
49) 1,4-Dichlorobenzene	18.87	146	772124	9031.058	pg	99
50) 1,2-Dichlorobenzene	19.20	146	734474	9009.252	pg	99
51) 1,2-Dibromo-3-chloropr...	19.61	157	267631	8886.247	pg	93
52) 1,2,4-Trichlorobenzene	20.82	182	521249	8812.341	pg	99
53) Naphthalene	20.93	128	1711143	10162.914	pg	99

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Data File : I:\MS19\DATA\2019 03\18\03181922.D Vial: 14
Acq On : 18 Mar 2019 20:14 Operator: TD
Sample : 10000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Mar 19 06:20:34 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	329162	8045.276	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181922.D
Acq On : 18 Mar 2019 20:14
Sample : 10000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131906 (4/11)

Vial: 14
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:34 2019

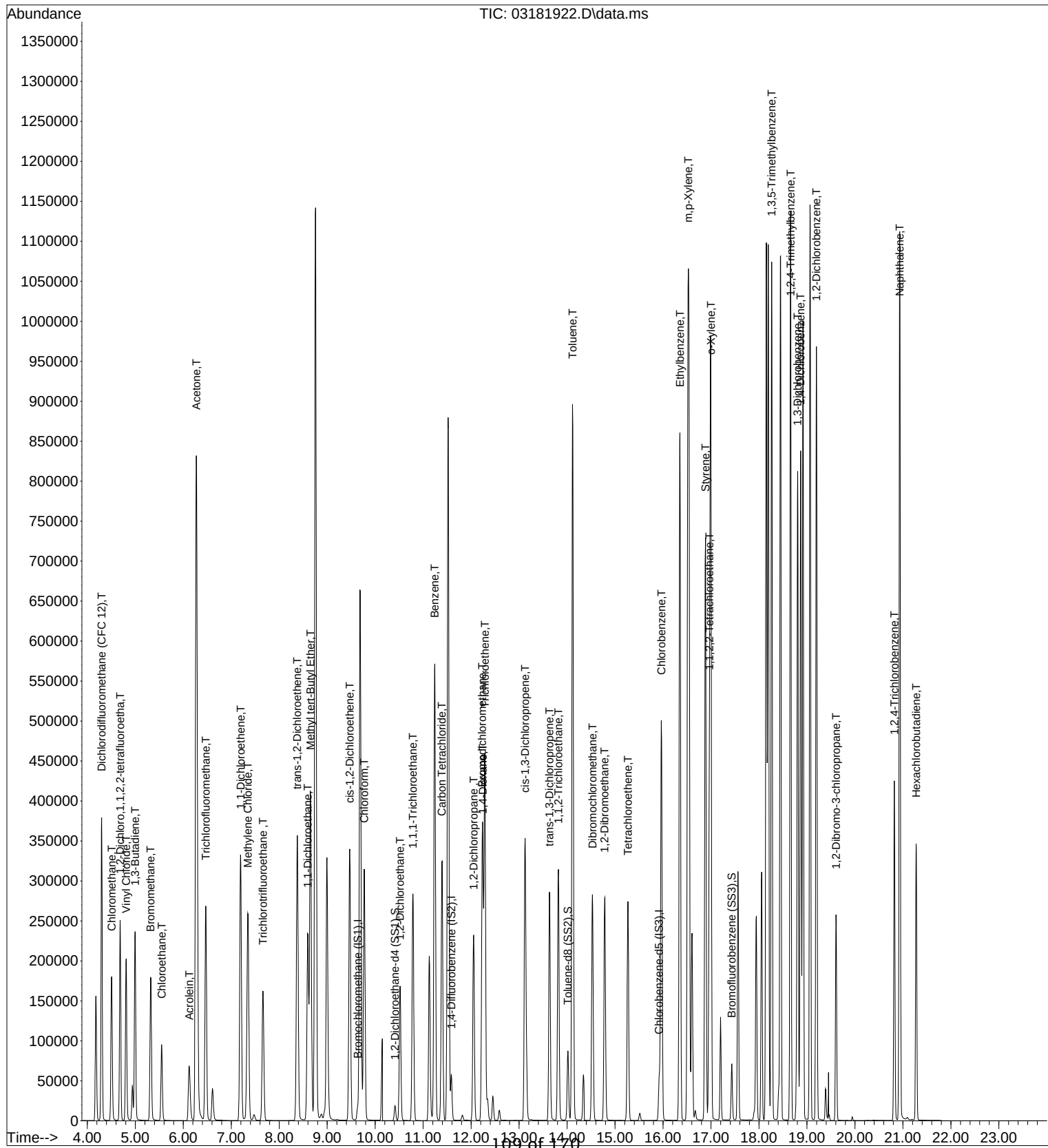
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181923.D
 Acq On : 18 Mar 2019 20:46
 Sample : 25000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131901 (4/11)

Vial: 15
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:35 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.65	130	24828	1000.000	pg	0.03
25) 1,4-Difluorobenzene (IS2)	11.59	114	114000	1000.000	pg	0.01
38) Chlorobenzene-d5 (IS3)	15.92	54	15475	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.42	65	28528	1114.689	pg	0.02
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	111.47%	
33) Toluene-d8 (SS2)	14.02	98	117339	1041.884	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.19%	
45) Bromofluorobenzene (SS3)	17.43	174	56869	876.095	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	87.61%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.30	85	1160350	26593.452	pg	100
3) Chloromethane	4.51	52	260193	33791.374	pg	98
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	834450	29275.011	pg	100
5) Vinyl Chloride	4.81	62	755960	33157.640	pg	100
6) 1,3-Butadiene	5.00	54	584555	36425.814	pg	92
7) Bromomethane	5.33	94	518285	27685.163	pg	100
8) Chloroethane	5.55	64	382839	30652.343	pg	99
9) Acrolein	6.14	56	295242	30747.799	pg	100
10) Acetone	6.29	58	1767872	158491.074	pg	# 87
11) Trichlorofluoromethane	6.48	101	948692	26924.895	pg	100
12) 1,1-Dichloroethene	7.20	96	710241	28918.502	pg	95
13) Methylene Chloride	7.36	84	711724	28752.694	pg	91
14) Trichlorotrifluoroethane	7.67	151	631348	24495.348	pg	100
15) trans-1,2-Dichloroethene	8.39	96	761587	29301.328	pg	100
16) 1,1-Dichloroethane	8.61	63	1030556	29442.278	pg	100
17) Methyl tert-Butyl Ether	8.66	73	1992137	32004.327	pg	98
18) cis-1,2-Dichloroethene	9.48	96	797927	28800.354	pg	100
19) Chloroform	9.78	83	1142142	30630.808	pg	100
21) 1,2-Dichloroethane	10.53	62	715179	28826.442	pg	100
22) 1,1,1-Trichloroethane	10.79	97	1039307	27906.706	pg	100
23) Benzene	11.25	78	2722397	29050.492	pg	100
24) Carbon Tetrachloride	11.40	117	945742	25942.851	pg	100
26) 1,2-Dichloropropane	12.06	63	634288	29571.927	pg	100
27) Bromodichloromethane	12.24	83	900532	27826.488	pg	100
28) Trichloroethene	12.29	130	886112	25204.394	pg	100
29) 1,4-Dioxane	12.25	88	637679	29090.383	pg	94
30) cis-1,3-Dichloropropene	13.12	75	1151400	32222.760	pg	99
31) trans-1,3-Dichloropropene	13.64	75	966922	32230.433	pg	99
32) 1,1,2-Trichloroethane	13.82	83	585791	28377.228	pg	98
34) Toluene	14.12	91	2957019	26828.162	pg	99
35) Dibromochloromethane	14.53	129	863373	26267.414	pg	100
36) 1,2-Dibromoethane	14.79	107	824144	27629.394	pg	100
37) Tetrachloroethene	15.27	166	912984	22722.923	pg	100
39) Chlorobenzene	15.97	112	2082260	22432.900	pg	99
40) Ethylbenzene	16.35	91	3304630	23087.471	pg	98
41) m,p-Xylene	16.53	91	5083401	46858.134	pg	99
42) Styrene	16.88	104	2195897	25694.735	pg	100
43) o-Xylene	17.00	106	1349248	23182.054	pg	98
44) 1,1,2,2-Tetrachloroethane	16.97	83	1229605	23351.317	pg	99
46) 1,3,5-Trimethylbenzene	18.27	105	2875882	22223.006	pg	98
47) 1,2,4-Trimethylbenzene	18.66	105	2811702	22321.307	pg	100
48) 1,3-Dichlorobenzene	18.81	146	1836454	20381.128	pg	99
49) 1,4-Dichlorobenzene	18.87	146	1819660	19440.481	pg	99
50) 1,2-Dichlorobenzene	19.20	146	1767486	19803.113	pg	99
51) 1,2-Dibromo-3-chloropr...	19.61	157	651800	19767.943	pg	93
52) 1,2,4-Trichlorobenzene	20.82	182	1174954	18143.961	pg	99
53) Naphthalene	20.93	128	3616068	19617.050	pg	99

Data File : I:\MS19\DATA\2019 03\18\03181923.D Vial: 15
Acq On : 18 Mar 2019 20:46 Operator: TD
Sample : 25000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131901 (4/11)

Quant Time: Mar 19 06:20:35 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	810063	18084.862	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181923.D
Acq On : 18 Mar 2019 20:46
Sample : 25000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131901 (4/11)

Vial: 15
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:35 2019

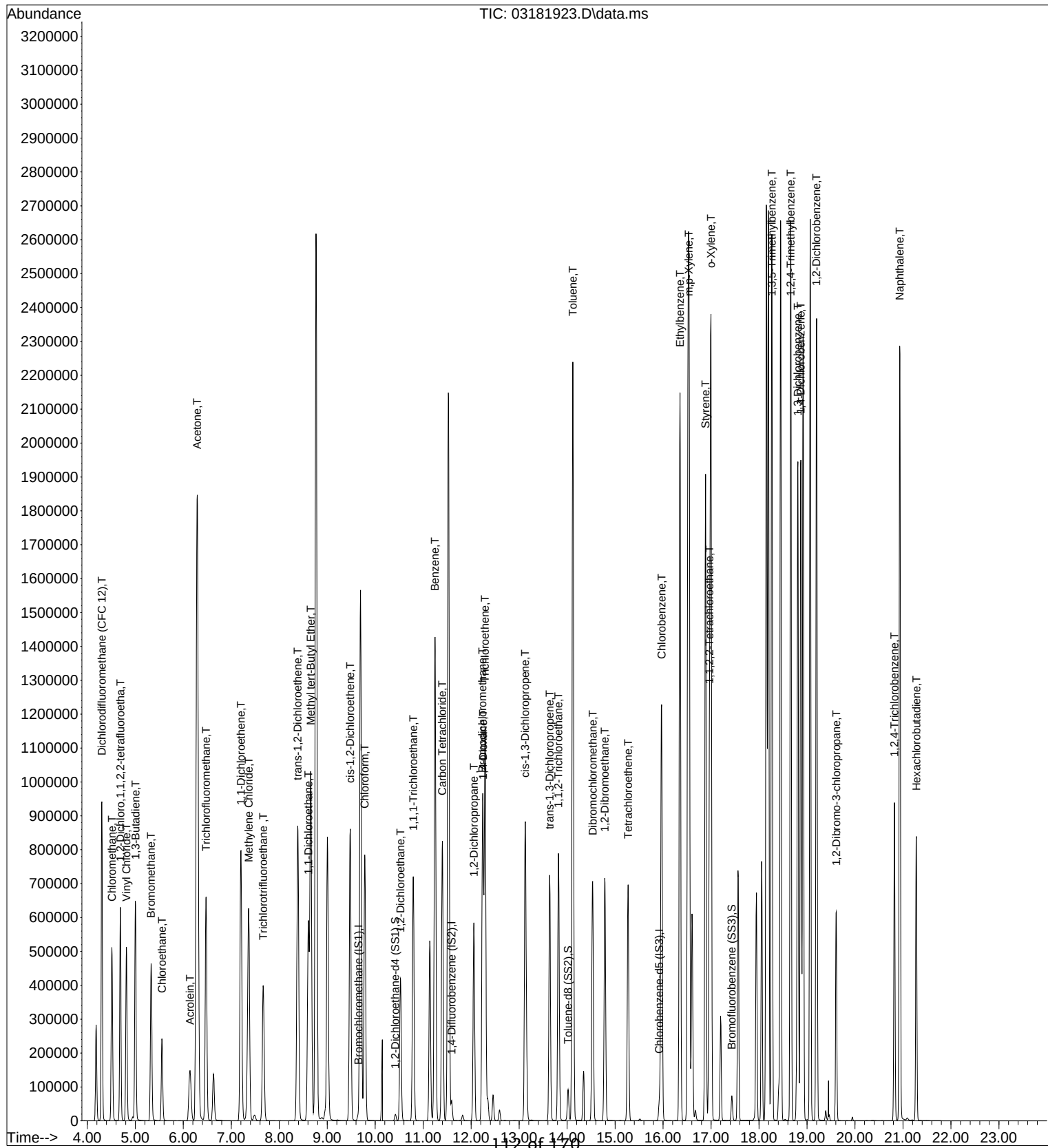
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181924.D
 Acq On : 18 Mar 2019 21:17
 Sample : 50000pg S19031819 ICAL Std
 Misc : S31-03161901/S31-03131901 (4/11)

Vial: 15
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 06:20:36 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:19:25 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 3/19/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.65	130	24485	1000.000	pg	0.03
25) 1,4-Difluorobenzene (IS2)	11.60	114	112819	1000.000	pg	0.02
38) Chlorobenzene-d5 (IS3)	15.92	54	16985	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.43	65	27971	1108.236	pg	0.03
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	110.82%	
33) Toluene-d8 (SS2)	14.02	98	116443	1044.751	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	104.48%	
45) Bromofluorobenzene (SS3)	17.43	174	56318	790.475	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	79.05%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.30	85	2197099	51059.548	pg	99
3) Chloromethane	4.52	52	492449	64850.470	pg	97
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	1602168	56996.269	pg	99
5) Vinyl Chloride	4.82	62	1409332	62681.552	pg	99
6) 1,3-Butadiene	5.01	54	1059224	66928.844	pg	91
7) Bromomethane	5.34	94	992034	53733.686	pg	100
8) Chloroethane	5.56	64	730855	59336.286	pg	99
9) Acrolein	6.15	56	562002	59349.271	pg	100
10) Acetone	6.31	58	3196795	290609.901	pg	# 85
11) Trichlorofluoromethane	6.48	101	1795679	51677.217	pg	99
12) 1,1-Dichloroethene	7.21	96	1356788	56017.493	pg	95
13) Methylene Chloride	7.37	84	1356976	55587.959	pg	90
14) Trichlorotrifluoroethane	7.67	151	1200481	47229.323	pg	100
15) trans-1,2-Dichloroethene	8.40	96	1457961	56879.441	pg	100
16) 1,1-Dichloroethane	8.61	63	1940836	56225.106	pg	99
17) Methyl tert-Butyl Ether	8.66	73	3749033	61073.160	pg	98
18) cis-1,2-Dichloroethene	9.49	96	1514953	55446.667	pg	100
19) Chloroform	9.79	83	2148597	58429.874	pg	100
21) 1,2-Dichloroethane	10.53	62	1343254	54900.469	pg	99
22) 1,1,1-Trichloroethane	10.80	97	1969622	53627.708	pg	99
23) Benzene	11.25	78	5118699	55386.415	pg	100
24) Carbon Tetrachloride	11.41	117	1802272	50131.071	pg	100
26) 1,2-Dichloropropane	12.06	63	1192340	56171.478	pg	99
27) Bromodichloromethane	12.24	83	1695648	52944.098	pg	100
28) Trichloroethene	12.30	130	1690232	48579.894	pg	100
29) 1,4-Dioxane	12.25	88	1202009	55408.660	pg	93
30) cis-1,3-Dichloropropene	13.13	75	2165797	61245.878	pg	99
31) trans-1,3-Dichloropropene	13.64	75	1851364	62357.561	pg	99
32) 1,1,2-Trichloroethane	13.82	83	1113265	54493.969	pg	98
34) Toluene	14.12	91	5483770	50273.444	pg	98
35) Dibromochloromethane	14.53	129	1650908	50753.306	pg	100
36) 1,2-Dibromoethane	14.79	107	1566625	53070.835	pg	99
37) Tetrachloroethene	15.27	166	1737890	43706.489	pg	100
39) Chlorobenzene	15.97	112	3911668	38395.254	pg	99
40) Ethylbenzene	16.36	91	6083665	38724.330	pg	97
41) m,p-Xylene	16.54	91	9162712	76951.974	pg	98
42) Styrene	16.88	104	4068810	43377.517	pg	100
43) o-Xylene	17.00	106	2476984	38774.700	pg	97
44) 1,1,2,2-Tetrachloroethane	16.97	83	2276194	39384.029	pg	99
46) 1,3,5-Trimethylbenzene	18.27	105	5219288	36745.833	pg	98
47) 1,2,4-Trimethylbenzene	18.66	105	4760842	34434.931	pg	100
48) 1,3-Dichlorobenzene	18.81	146	3365167	34026.705	pg	99
49) 1,4-Dichlorobenzene	18.87	146	3399285	33087.918	pg	99
50) 1,2-Dichlorobenzene	19.20	146	3141450	32068.064	pg	99
51) 1,2-Dibromo-3-chloropr...	19.61	157	1235734	34145.795	pg	92
52) 1,2,4-Trichlorobenzene	20.82	182	2224512	31297.604	pg	100
53) Naphthalene	20.94	128	6328019	31277.353	pg	98

Data File : I:\MS19\DATA\2019 03\18\03181924.D Vial: 15
Acq On : 18 Mar 2019 21:17 Operator: TD
Sample : 50000pg S19031819 ICAL Std Inst : MS19
Misc : S31-03161901/S31-03131901 (4/11)

Quant Time: Mar 19 06:20:36 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

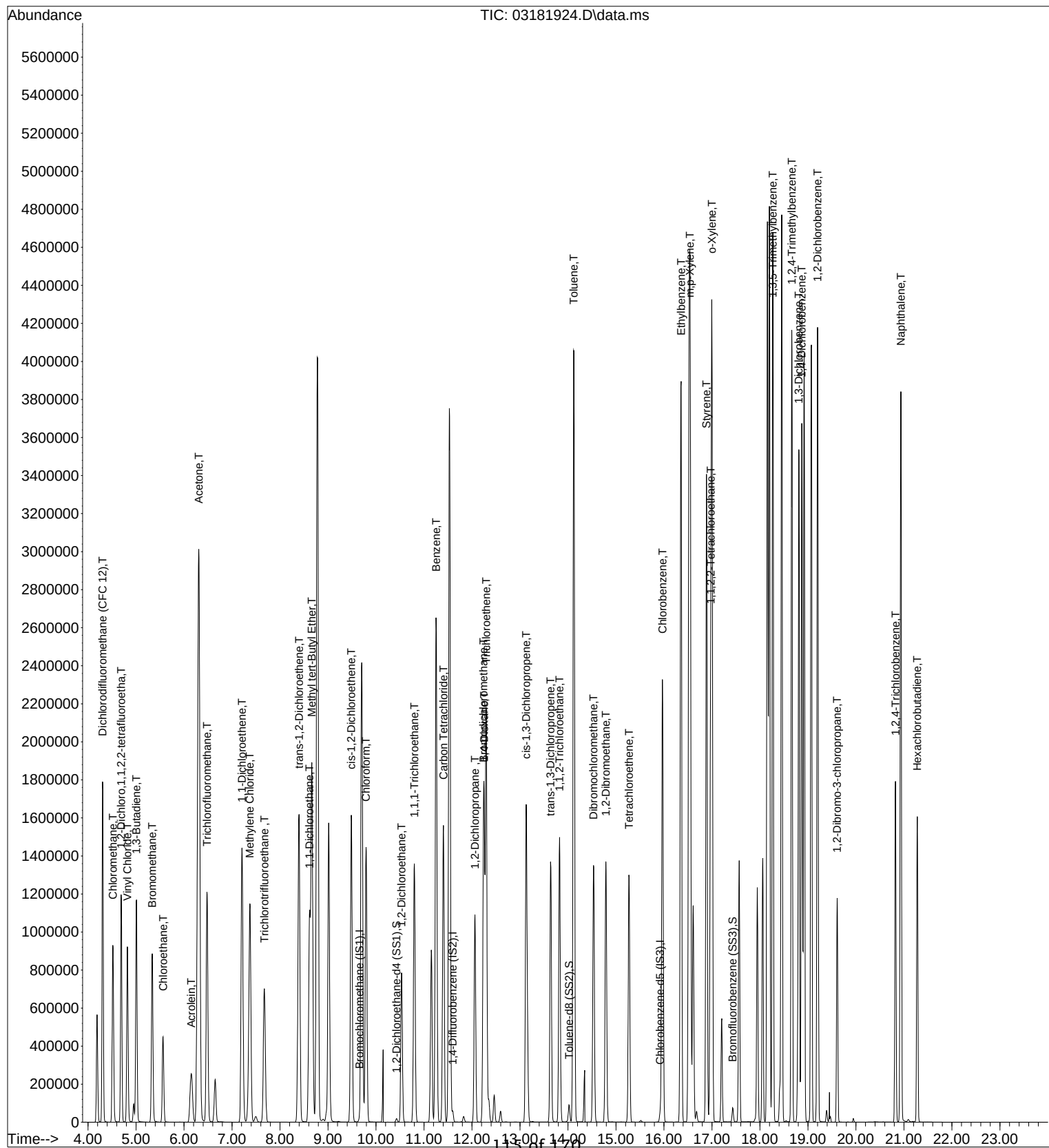
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	1528480	31090.040	pg	99

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

Data File : I:\MS19\DATA\2019 03\18\03181924.D
Acq On : 18 Mar 2019 21:17
Sample : 50000pg S19031819 ICAL Std
Misc : S31-03161901/S31-03131901 (4/11)

Vial: 15
Operator: TD
Inst : MS19

Quant Time: Mar 19 06:20:36 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:19:25 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



Data File : I:\MS19\DATA\2019 03\18\03181927.D
 Acq On : 18 Mar 2019 22:52
 Sample : 1000pg S19031819 ICV Std.
 Misc : S31-03161901/S31-03051905 (4/3)

Vial: 16
 Operator: TD
 Inst : MS19

Quant Time: Mar 19 08:14:42 2019

TD 3/19/19

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 08:07:16 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	20986	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	96155	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12255	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	24742	1011.458	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	101.15%
33) Toluene-d8 (SS2)	14.01	98	100768	1008.432	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	100.84%
45) Bromofluorobenzene (SS3)	17.43	174	48318	1036.511	pg	0.00
Spiked Amount	1000.000	Range	70 - 130	Recovery	=	103.65%

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.32	85	45145	1038.783	pg	100
3) Chloromethane	4.52	52	10033	1049.039	pg	99
4) 1,2-Dichloro,1,1,2,2-t...	4.70	85	29795	953.135	pg	100
5) Vinyl Chloride	4.82	62	28455	1044.685	pg	99
6) 1,3-Butadiene	5.01	54	21860	1086.774	pg	93
7) Bromomethane	5.33	94	19786	1014.811	pg	100
8) Chloroethane	5.56	64	14472	1046.707	pg	100
9) Acrolein	6.12	56	10562	997.706	pg	98
10) Acetone	6.26	58	68260	5096.043	pg	93
11) Trichlorofluoromethane	6.48	101	34289	1029.327	pg	100
12) 1,1-Dichloroethene	7.20	96	25105	1054.255	pg	97
13) Methylene Chloride	7.33	84	25540	1036.240	pg	91
14) Trichlorotrifluoroethane	7.66	151	24684	1104.434	pg	100
15) trans-1,2-Dichloroethene	8.37	96	26845	1056.200	pg	99
16) 1,1-Dichloroethane	8.58	63	39190	1075.637	pg	100
17) Methyl tert-Butyl Ether	8.65	73	69004	1112.764	pg	98
18) cis-1,2-Dichloroethene	9.46	96	28246	1044.881	pg	100
19) Chloroform	9.76	83	41270	1058.046	pg	100
21) 1,2-Dichloroethane	10.50	62	26354	1068.009	pg	100
22) 1,1,1-Trichloroethane	10.78	97	36464	1045.176	pg	100
23) Benzene	11.23	78	102533	989.136	pg	100
24) Carbon Tetrachloride	11.39	117	32771	997.481	pg	100
26) 1,2-Dichloropropane	12.05	63	23260	1058.549	pg	99
27) Bromodichloromethane	12.22	83	31494	1035.216	pg	100
28) Trichloroethene	12.28	130	30766	1010.326	pg	100
29) 1,4-Dioxane	12.25	88	21651	1018.120	pg	95
30) cis-1,3-Dichloropropene	13.12	75	36602	1069.749	pg	100
31) trans-1,3-Dichloropropene	13.63	75	30270	1077.173	pg	100
32) 1,1,2-Trichloroethane	13.81	83	20868	1041.729	pg	99
34) Toluene	14.11	91	107422	1012.764	pg	100
35) Dibromochloromethane	14.53	129	28305	1004.166	pg	100
36) 1,2-Dibromoethane	14.78	107	28309	1046.224	pg	99
37) Tetrachloroethene	15.27	166	32440	990.878	pg	99
39) Chlorobenzene	15.96	112	74933	1014.606	pg	100
40) Ethylbenzene	16.35	91	117442	1035.177	pg	100
41) m,p-Xylene	16.53	91	182547	2141.975	pg	100
42) Styrene	16.88	104	71075	1115.228	pg	100
43) o-Xylene	16.99	106	48220	1068.528	pg	100
44) 1,1,2,2-Tetrachloroethane	16.97	83	42900	995.651	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	102940	1045.746	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	102811	1071.772	pg	100
48) 1,3-Dichlorobenzene	18.81	146	63809	1010.439	pg	100
49) 1,4-Dichlorobenzene	18.87	146	64064	985.386	pg	100
50) 1,2-Dichlorobenzene	19.20	146	62558	994.719	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	20431	922.788	pg	97
52) 1,2,4-Trichlorobenzene	20.82	182	40477	983.120	pg	99
53) Naphthalene	20.93	128	122303	952.592	pg	100

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Data File : I:\MS19\DATA\2019 03\18\03181927.D Vial: 16
Acq On : 18 Mar 2019 22:52 Operator: TD
Sample : 1000pg S19031819 ICV Std. Inst : MS19
Misc : S31-03161901/S31-03051905 (4/3)

Quant Time: Mar 19 08:14:42 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 08:07:16 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	28059	932.547	pg	100

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

Data File : I:\MS19\DATA\2019 03\18\03181927.D
Acq On : 18 Mar 2019 22:52
Sample : 1000pg S19031819 ICV Std.
Misc : S31-03161901/S31-03051905 (4/3)

Vial: 16
Operator: TD
Inst : MS19

Quant Time: Mar 19 08:14:42 2019

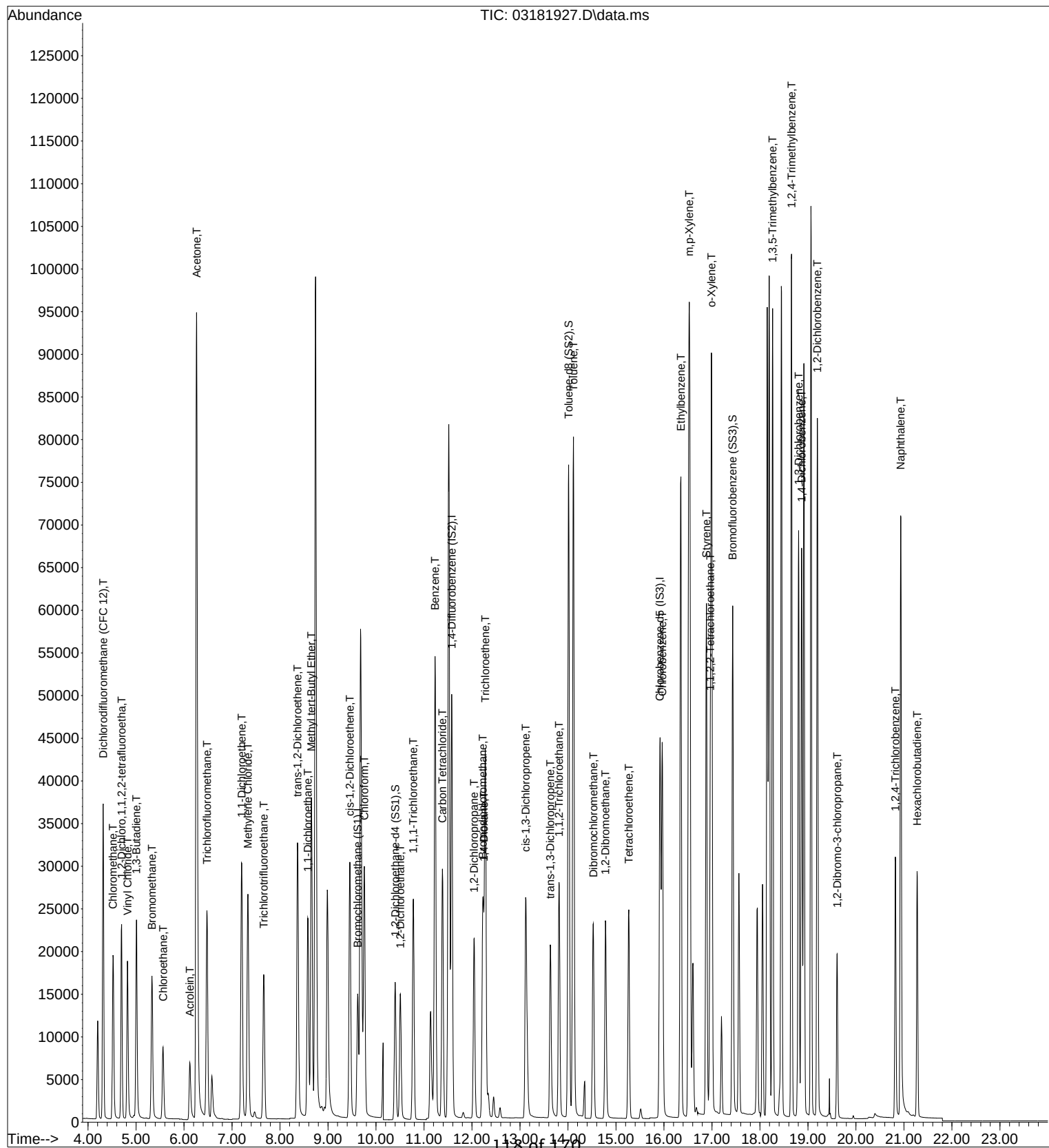
Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 08:07:16 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M



Laboratory Control Sample Recovery Check Sheet - MS19

Data File Name: 03181927.D
 Data File Path: I:\MS19\DATA\2019_03\18\
 Operator: TD
 Instrument Name: MS19
 Sample Name: 1000pg S19031819 ICV Std.
 Misc Info: S31-03161901/S31-03051905 (4/3)
 Date Acquired: 3/18/19 22:52
 Acq. Method File: TO15SIM.M

TD 3/19/19

#	Compound Name	Ret. Time	Amount Spiked (pg)	Amount Found (pg)	Percent Recovery	Lower Limit	Upper Limit	Flag	70-130 % Method
2)	Dichlorodifluoromethane (CFC 12)	4.32	1052.0	1038.8	99	76	120	*	*
3)	Chloromethane	4.52	1055.0	1049.0	99	70	125	*	*
4)	1,2-Dichloro,1,1,2,2-tetrafluoroetha *	4.70	1055.0	953.1	90	54	128	*	*
5)	Vinyl Chloride	4.82	1069.0	1044.7	98	56	138	*	*
6)	1,3-Butadiene *	5.01	1051.0	1086.8	103	55	141	*	*
7)	Bromomethane	5.33	1059.0	1014.8	96	73	119	*	*
8)	Chloroethane	5.56	1070.0	1046.7	98	68	126	*	*
9)	Acrolein *	6.12	1025.0	997.7	97	66	126	*	*
10)	Acetone	6.26	5293.0	5096.0	96	62	126	*	*
11)	Trichlorofluoromethane	6.48	1056.0	1029.3	97	78	117	*	*
12)	1,1-Dichloroethene	7.20	1089.0	1054.3	97	84	122	*	*
13)	Methylene Chloride	7.33	1083.0	1036.2	96	73	115	*	*
14)	Trichlorotrifluoroethane	7.66	1078.0	1104.4	102	70	122	*	*
15)	trans-1,2-Dichloroethene	8.37	1069.0	1056.2	99	80	117	*	*
16)	1,1-Dichloroethane	8.58	1078.0	1075.6	100	74	123	*	*
17)	Methyl tert-Butyl Ether	8.65	1072.0	1112.8	104	76	119	*	*
18)	cis-1,2-Dichloroethene	9.46	1054.0	1044.9	99	79	116	*	*
19)	Chloroform	9.76	1083.0	1058.0	98	75	117	*	*
21)	1,2-Dichloroethane	10.50	1074.0	1068.0	99	74	123	*	*
22)	1,1,1-Trichloroethane	10.78	1076.0	1045.2	97	79	117	*	*
25)	Benzene	11.23	1055.0	989.1	94	73	125	*	*
24)	Carbon Tetrachloride	11.39	1058.0	997.5	94	79	118	*	*
26)	1,2-Dichloropropane	12.05	1079.0	1058.5	98	75	122	*	*
27)	Bromodichloromethane	12.22	1073.0	1035.2	96	79	118	*	*
28)	Trichloroethene	12.28	1067.0	1010.3	95	79	116	*	*
29)	1,4-Dioxane	12.25	1069.0	1018.1	95	77	121	*	*
30)	cis-1,3-Dichloropropene	13.12	1071.0	1069.7	100	78	120	*	*
31)	trans-1,3-Dichloropropene	13.63	1064.0	1077.2	101	77	121	*	*
32)	1,1,2-Trichloroethane	13.81	1074.0	1041.7	97	79	118	*	*
34)	Toluene	14.01	1060.0	1012.8	96	76	111	*	*
35)	Dibromochloromethane *	14.53	1064.0	1004.2	94	80	116	*	*
36)	1,2-Dibromoethane	14.78	1081.0	1046.2	97	80	118	*	*
37)	Tetrachloroethene	15.27	1064.0	990.9	93	77	117	*	*
39)	Chlorobenzene	15.96	1073.0	1014.6	95	69	129	*	*
40)	Ethylbenzene	16.35	1061.0	1035.2	98	66	133	*	*
41)	m,p-Xylene	16.53	2131.0	2142.0	101	62	137	*	*
42)	Styrene *	16.88	1060.0	1115.2	105	56	146	*	*
43)	o-Xylene	16.99	1070.0	1068.5	100	62	137	*	*
44)	1,1,2,2-Tetrachloroethane	16.97	1072.0	995.7	93	72	127	*	*
46)	1,3,5-Trimethylbenzene	18.26	1069.0	1045.7	98	64	139	*	*
47)	1,2,4-Trimethylbenzene *	18.66	1076.0	1071.8	100	61	142	*	*
48)	1,3-Dichlorobenzene	18.81	1079.0	1010.4	94	65	134	*	*
49)	1,4-Dichlorobenzene	18.87	1080.0	985.4	91	63	132	*	*
50)	1,2-Dichlorobenzene	19.20	1078.0	994.7	92	66	135	*	*
51)	1,2-Dibromo-3-chloropropane *	19.61	1046.0	922.8	88	64	143	*	*
52)	1,2,4-Trichlorobenzene	20.82	1071.0	983.1	92	54	152	*	*
53)	Naphthalene	19.20	1015.0	952.6	94	47	158	*	*
54)	Hexachlorobutadiene	21.27	1045.0	932.5	89	64	134	*	*

* Compounds with 70 - 130 as advisory limits

Data File : I:\MS19\DATA\2019 04\05\04051902.D
 Acq On : 5 Apr 2019 4:53
 Sample : CCV S19040519 1000pg
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 15
 Operator: TD
 Inst : MS19

Quant Time: Apr 05 08:22:24 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/5/19

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 I	Bromochloromethane (IS1)	1.000	1.000	0.0	100	0.00
2 T	Dichlorodifluoromethane (CF	2.071	1.891	8.7	84	-0.03
3 T	Chloromethane	0.456	0.409	10.3	84	-0.03
4 T	1,2-Dichloro,1,1,2,2-tetra	1.490	1.292	13.3	81	-0.02
5 T	Vinyl Chloride	1.298	1.094	15.7	78	-0.03
6 T	1,3-Butadiene	0.958	0.773	19.3	77	-0.03
7 T	Bromomethane	0.929	0.810	12.8	84	-0.03
8 T	Chloroethane	0.659	0.589	10.6	84	-0.03
9 T	Acrolein	0.504	0.441	12.5	85	-0.04
10 T	Acetone	0.733	0.575	21.6	88	-0.03
11 T	Trichlorofluoromethane	1.587	1.404	11.5	84	-0.02
12 T	1,1-Dichloroethene	1.135	1.101	3.0	92	-0.02
13 T	Methylene Chloride	1.174	1.039	11.5	85	-0.02
14 T	Trichlorotrifluoroethane	1.065	0.953	10.5	81	0.00
15 T	trans-1,2-Dichloroethene	1.211	1.120	7.5	86	-0.02
16 T	1,1-Dichloroethane	1.736	1.578	9.1	84	0.00
17 T	Methyl tert-Butyl Ether	2.955	2.742	7.2	85	-0.03
18 T	cis-1,2-Dichloroethene	1.288	1.176	8.7	85	-0.01
19 T	Chloroform	1.997	1.685	15.6	84	0.00
20 S	1,2-Dichloroethane-d4 (SS1)	1.166	1.132	2.9	97	0.00
21 T	1,2-Dichloroethane	1.176	1.061	9.8	83	0.00
22 T	1,1,1-Trichloroethane	1.662	1.509	9.2	85	0.00
23 T	Benzene	4.939	4.687	5.1	93	0.00
24 T	Carbon Tetrachloride	1.566	1.402	10.5	84	0.00
25 I	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	99	0.00
26 T	1,2-Dichloropropane	0.229	0.212	7.4	85	0.00
27 T	Bromodichloromethane	0.316	0.288	8.9	84	0.00
28 T	Trichloroethene	0.317	0.292	7.9	85	0.00
29 T	1,4-Dioxane	0.221	0.205	7.2	85	-0.03
30 T	cis-1,3-Dichloropropene	0.356	0.341	4.2	87	0.00
31 T	trans-1,3-Dichloropropene	0.292	0.289	1.0	89	-0.01
32 T	1,1,2-Trichloroethane	0.208	0.192	7.7	85	0.00
33 S	Toluene-d8 (SS2)	1.039	1.041	-0.2	100	0.00
34 T	Toluene	1.103	1.005	8.9	85	0.00
35 T	Dibromochloromethane	0.293	0.268	8.5	84	0.00
36 T	1,2-Dibromoethane	0.281	0.265	5.7	86	0.00
37 T	Tetrachloroethene	0.340	0.311	8.5	85	0.00
38 I	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	102	0.00
39 T	Chlorobenzene	6.026	5.672	5.9	88	0.00
40 T	Ethylbenzene	9.258	9.041	2.3	89	0.00
41 T	m,p-Xylene	6.954	6.757	2.8	86	0.00
42 T	Styrene	5.200	5.178	0.4	85	0.00
43 T	o-Xylene	3.682	3.574	2.9	87	0.00
44 T	1,1,2,2-Tetrachloroethane	3.516	3.318	5.6	86	0.00
45 S	Bromofluorobenzene (SS3)	3.804	4.187	-10.1	108	0.00
46 T	1,3,5-Trimethylbenzene	8.032	7.796	2.9	87	0.00
47 T	1,2,4-Trimethylbenzene	7.828	7.806	0.3	87	0.00
48 T	1,3-Dichlorobenzene	5.153	5.027	2.4	88	0.00
49 T	1,4-Dichlorobenzene	5.305	5.055	4.7	87	0.00
50 T	1,2-Dichlorobenzene	5.132	4.847	5.6	88	0.00
51 T	1,2-Dibromo-3-chloropropane	1.807	1.739	3.8	90	0.00
52 T	1,2,4-Trichlorobenzene	3.360	3.430	-2.1	91	0.00
53 T	Naphthalene	10.477	11.443	-9.2	90	0.00
54 T	Hexachlorobutadiene	2.557	2.261	11.6	89	0.00

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Data File : I:\MS19\DATA\2019 04\05\04051902.D Vial: 15
Acq On : 5 Apr 2019 4:53 Operator: TD
Sample : CCV S19040519 1000pg Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Apr 05 08:22:24 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.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)

(#) = Out of Range

SPCC's out = 0 CCC's out = 0

Data File : I:\MS19\DATA\2019 04\05\04051902.D
 Acq On : 5 Apr 2019 4:53
 Sample : CCV S19040519 1000pg
 Misc : S31-03161901/S31-03131906 (4/11)

Vial: 15
 Operator: TD
 Inst : MS19

Quant Time: Apr 05 08:22:24 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/5/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	22732	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	102140	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	12994	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25729	971.020	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	97.10%	
33) Toluene-d8 (SS2)	14.01	98	106326	1001.704	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	100.17%	
45) Bromofluorobenzene (SS3)	17.43	174	54406	1100.733	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	110.07%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	44913	954.068	pg	100
3) Chloromethane	4.52	52	9372	904.659	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.70	85	30201	891.917	pg	100
5) Vinyl Chloride	4.82	62	26135	885.812	pg	100
6) 1,3-Butadiene	5.01	54	18423	845.554	pg	91
7) Bromomethane	5.33	94	18576	879.572	pg	100
8) Chloroethane	5.56	64	13682	913.562	pg	100
9) Acrolein	6.12	56	10305	898.662	pg	99
10) Acetone	6.27	58	70192	4210.486	pg	98
11) Trichlorofluoromethane	6.47	101	33827	937.463	pg	100
12) 1,1-Dichloroethene	7.20	96	26877	1041.978	pg	96
13) Methylene Chloride	7.33	84	25277	946.798	pg	89
14) Trichlorotrifluoroethane	7.66	151	23071	952.977	pg	100
15) trans-1,2-Dichloroethene	8.37	96	27032	981.868	pg	99
16) 1,1-Dichloroethane	8.58	63	36951	936.286	pg	100
17) Methyl tert-Butyl Ether	8.66	73	67887	1010.665	pg	98
18) cis-1,2-Dichloroethene	9.45	96	28174	962.167	pg	100
19) Chloroform	9.76	83	41258	908.855	pg	100
21) 1,2-Dichloroethane	10.51	62	25590	957.394	pg	99
22) 1,1,1-Trichloroethane	10.78	97	37074	981.040	pg	100
23) Benzene	11.23	78	110050	980.109	pg	99
24) Carbon Tetrachloride	11.39	117	33027	928.060	pg	100
26) 1,2-Dichloropropane	12.05	63	23224	994.980	pg	100
27) Bromodichloromethane	12.23	83	31455	973.350	pg	100
28) Trichloroethene	12.28	130	31704	980.123	pg	100
29) 1,4-Dioxane	12.25	88	22242	984.625	pg	94
30) cis-1,3-Dichloropropene	13.12	75	38959	1071.916	pg	100
31) trans-1,3-Dichloropropene	13.64	75	31166	1044.071	pg	100
32) 1,1,2-Trichloroethane	13.82	83	21091	991.168	pg	98
34) Toluene	14.11	91	107943	958.044	pg	100
35) Dibromochloromethane	14.53	129	29406	982.097	pg	100
36) 1,2-Dibromoethane	14.78	107	29128	1013.414	pg	99
37) Tetrachloroethene	15.27	166	33583	965.684	pg	100
39) Chlorobenzene	15.97	112	78566	1003.296	pg	100
40) Ethylbenzene	16.35	91	121354	1008.825	pg	99
41) m,p-Xylene	16.53	91	186388	2062.662	pg	99
42) Styrene	16.88	104	71315	1055.354	pg	99
43) o-Xylene	17.00	106	49319	1030.727	pg	99
44) 1,1,2,2-Tetrachloroethane	16.96	83	45868	1003.991	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	107075	1025.889	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	108324	1065.021	pg	100
48) 1,3-Dichlorobenzene	18.81	146	70553	1053.693	pg	100
49) 1,4-Dichlorobenzene	18.87	146	71000	1029.962	pg	100
50) 1,2-Dichlorobenzene	19.19	146	68592	1028.635	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	23545	1002.955	pg	95
52) 1,2,4-Trichlorobenzene	20.82	182	47420	1086.251	pg	99
53) Naphthalene	20.93	128	152407	1119.554	pg	100

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Data File : I:\MS19\DATA\2019 04\05\04051902.D Vial: 15
Acq On : 5 Apr 2019 4:53 Operator: TD
Sample : CCV S19040519 1000pg Inst : MS19
Misc : S31-03161901/S31-03131906 (4/11)

Quant Time: Apr 05 08:22:24 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

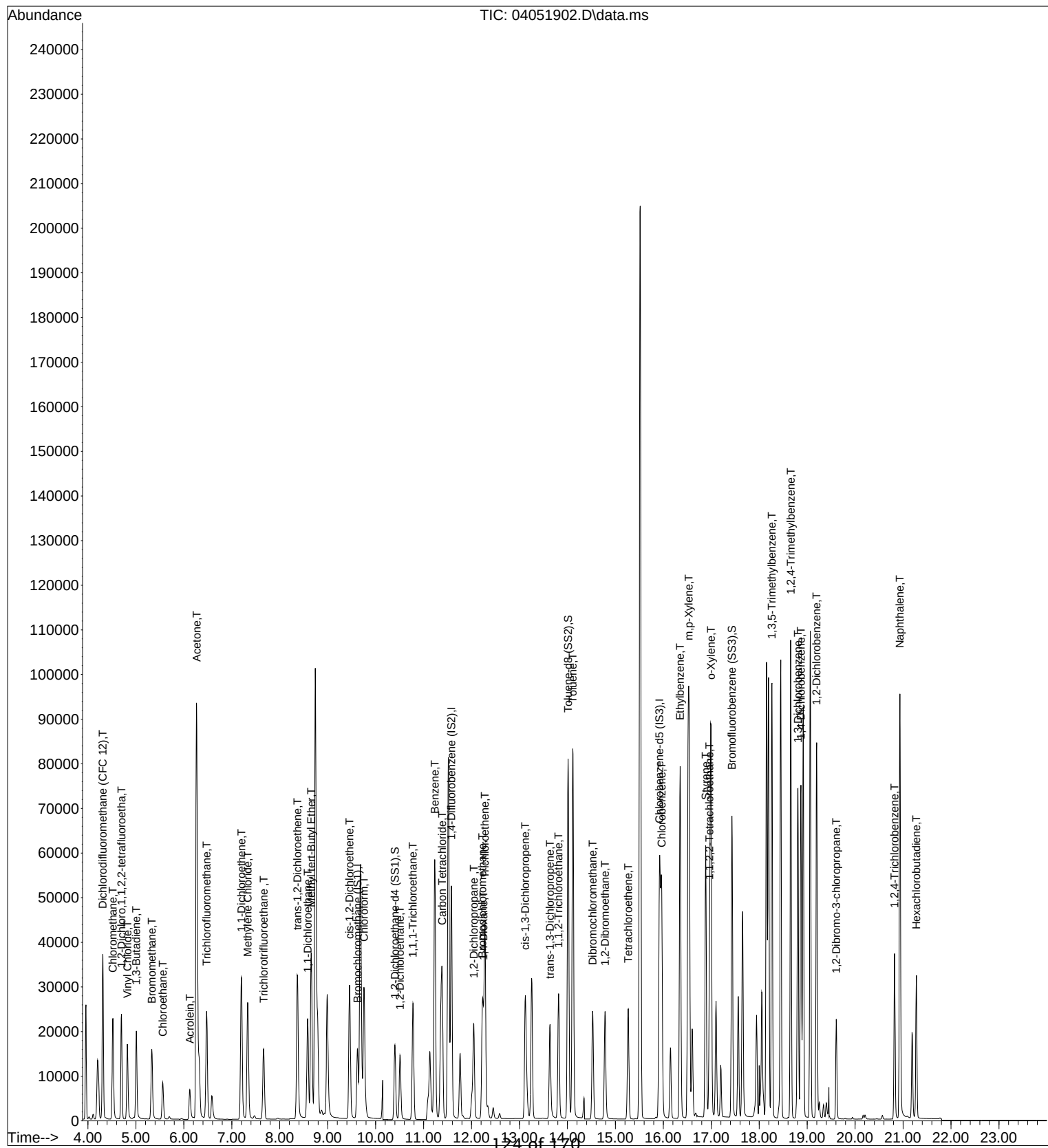
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.28	225	30940	931.331	pg	100

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

Data File : I:\MS19\DATA\2019 04\05\04051902.D
Acq On : 5 Apr 2019 4:53
Sample : CCV S19040519 1000pg
Misc : S31-03161901/S31-03131906 (4/11)

Vial: 15
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:22:24 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

ALS Project ID: P1901824

Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

Internal Standard Area and RT Summary

Test Code: EPA TO-15 SIM

Instrument ID: Tekmar AUTOCAN/Agilent 5975Cinert/7890A/MS19

Lab File ID: 04051902.D

Analyst: Topacio De Leon

Date Analyzed: 4/5/19

Sample Type: 6.0 L Summa Canister(s)

Time Analyzed: 04:53

Test Notes:

	IS1 (BCM)			IS2 (DFB)			IS3 (CBZ)		
	AREA	#	RT	AREA	#	RT	AREA	#	RT
24 Hour Standard	22732		9.62	102140		11.58	12994		15.92
Upper Limit	31825		9.95	142996		11.91	18192		16.25
Lower Limit	13639		9.29	61284		11.25	7796		15.59

Client Sample ID		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA	RT	AREA	RT	AREA	RT
01	Method Blank	20063	9.62	86048	11.58	11159	15.92
02	Lab Control Sample	22046	9.62	98811	11.58	12514	15.91
03	HUCK IA F040219-1	21738	9.62	97630	11.58	12949	15.91
04	HUCK IA F040219-2	22174	9.62	99726	11.58	12991	15.91
05	HUCK IA FR040219-2	22401	9.62	100710	11.58	13077	15.91
06	HUCK IA F040219-3	22372	9.63	102154	11.58	13196	15.92
07	HUCK IA F040219-4	23008	9.64	103695	11.59	14128	15.92
08	HUCK IA F040219-5	21821	9.62	98374	11.58	12451	15.91
09	HUCK IA F040219-6	21119	9.62	95232	11.58	12047	15.91
10	HUCK AA F040219-1	20384	9.62	91507	11.58	11645	15.92
11	HUCK AA F040219-2	20922	9.62	94035	11.58	11740	15.91
12	TRIPBLANK 040219-1	19730	9.63	84793	11.58	11158	15.92
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

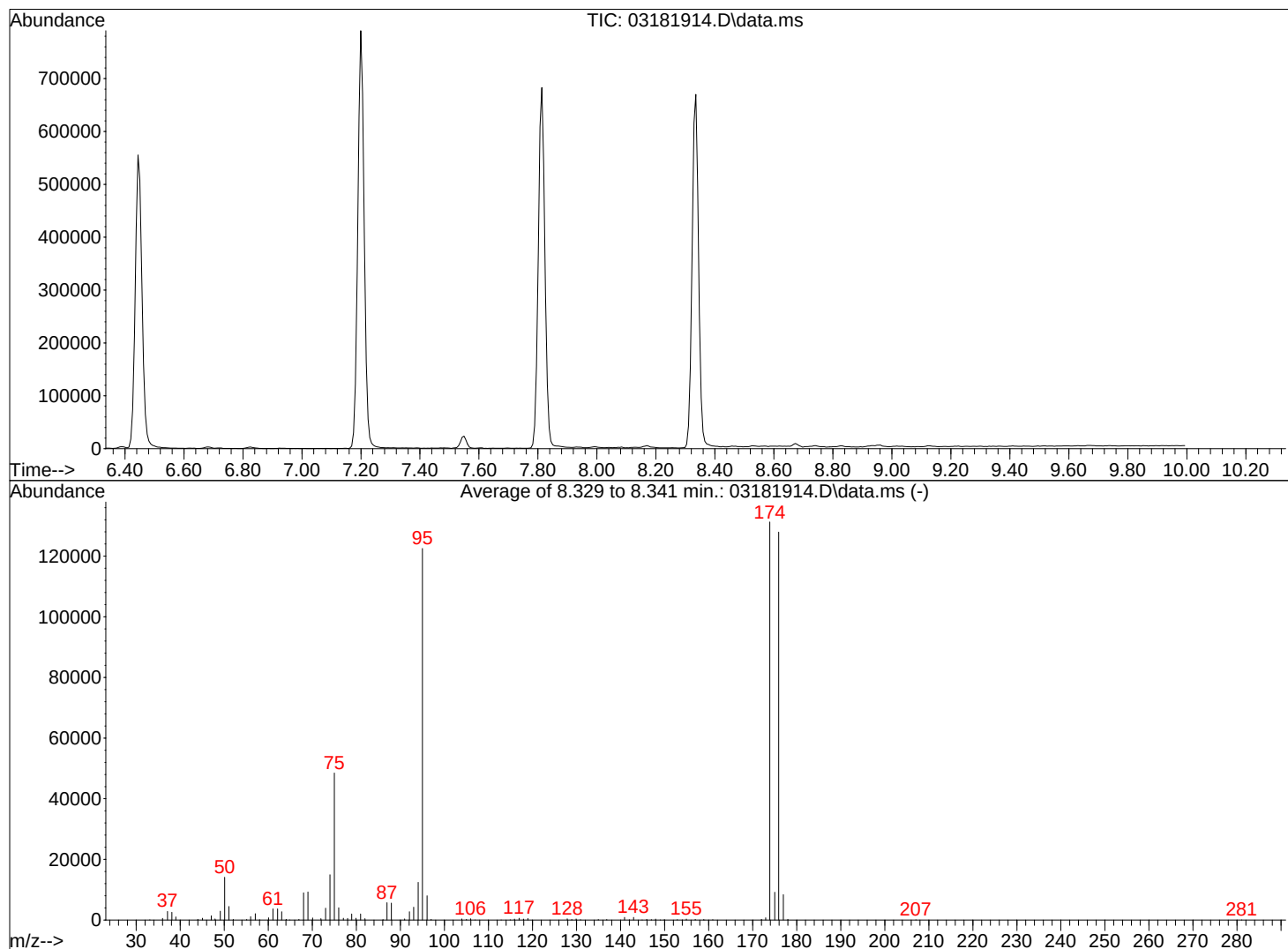
Column used to flag values outside QC limits with an I.

I = Internal standard not within the specified limits. See case narrative.

Data Path : I:\MS19\DATA\2019 03\18\
 Data File : 03181914.D
 Acq On : 18 Mar 2019 16:00
 Operator : TD
 Sample : BFB S19031819
 Misc : S31-03161901
 ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : I:\MS19\METHODS\S19031819.M
 Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
 Last Update : Tue Mar 19 08:07:16 2019



AutoFind: Scans 691, 692, 693; Background Corrected with Scan 684

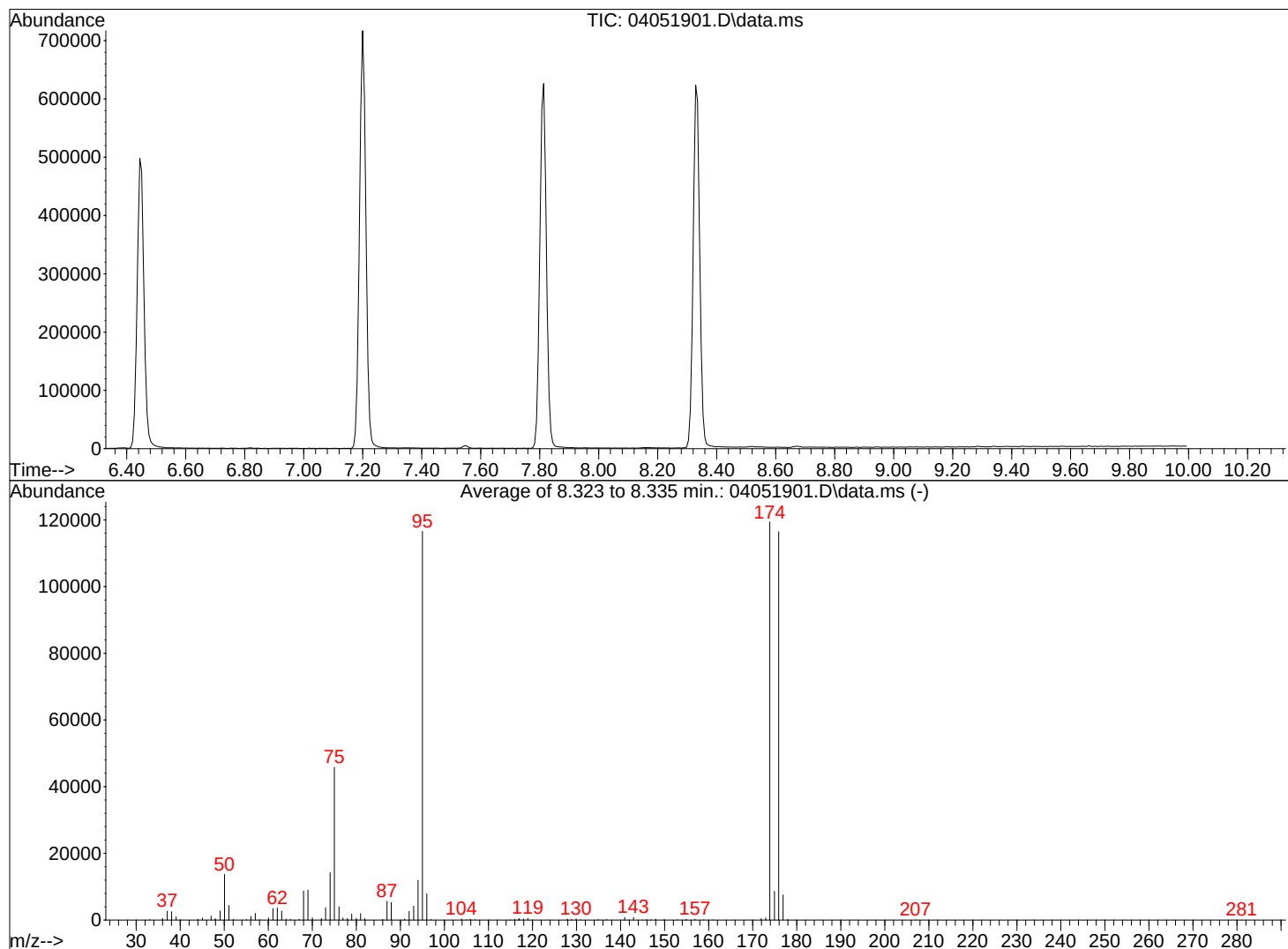
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	11.5	14116	PASS
75	95	30	66	39.6	48472	PASS
95	95	100	100	100.0	122555	PASS
96	95	5	9	6.5	8015	PASS
173	174	0.00	2	0.6	733	PASS
174	95	50	120	107.1	131280	PASS
175	174	4	9	7.0	9194	PASS
176	174	93	101	97.4	127931	PASS
177	176	5	9	6.6	8382	PASS

TD 3/19/19

Data Path : I:\MS19\DATA\2019 04\05\
Data File : 04051901.D
Acq On : 5 Apr 2019 4:33
Operator : TD
Sample : BFB S19040519
Misc : S31-03161901
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : I:\MS19\METHODS\S19031819.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Tue Mar 19 06:44:10 2019



AutoFind: Scans 690, 691, 692; Background Corrected with Scan 683

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	11.7	13682	PASS
75	95	30	66	39.3	45835	PASS
95	95	100	100	100.0	116573	PASS
96	95	5	9	6.8	7927	PASS
173	174	0.00	2	0.6	684	PASS
174	95	50	120	102.4	119397	PASS
175	174	4	9	7.2	8647	PASS
176	174	93	101	97.5	116424	PASS
177	176	5	9	6.5	7531	PASS

TD 4/5/19

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: WSP Group

Client Sample ID: Method Blank

Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824

ALS Sample ID: P190405-MB

Test Code: EPA TO-15 SIM

Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19

Analyst: Topacio De Leon

Sample Type: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 4/5/19

Volume(s) Analyzed: 1.00 Liter(s)

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m ³	MRL µg/m ³	MDL µg/m ³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.11	0.0092	ND	0.028	0.0023	
79-01-6	Trichloroethene	ND	0.11	0.0085	ND	0.020	0.0016	
127-18-4	Tetrachloroethene	ND	0.11	0.0082	ND	0.016	0.0012	

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.

Data File : I:\MS19\DATA\2019 04\05\04051904.D
 Acq On : 5 Apr 2019 5:56
 Sample : MB S19040519 1000mL
 Misc : S31-03161901

Vial: 1
 Operator: TD
 Inst : MS19

Quant Time: Apr 05 08:24:05 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/5/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	20063	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	86048	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.92	54	11159	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	22849	977.044	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	97.70%	
33) Toluene-d8 (SS2)	14.01	98	92179	1030.830	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	103.08%	
45) Bromofluorobenzene (SS3)	17.44	174	43855	1033.170	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	103.32%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.33	85	200	4.814	pg	100
3) Chloromethane	0.00	52	0	N.D.		
4) 1,2-Dichloro,1,1,2,2-t...	0.00	85	0	N.D.		
5) Vinyl Chloride	0.00	62	0	N.D.		
6) 1,3-Butadiene	0.00	54	0	N.D.		
7) Bromomethane	0.00	94	0	N.D.		
8) Chloroethane	0.00	64	0	N.D.		
9) Acrolein	6.19	56	130	12.845	pg	97
10) Acetone	6.33	58	1411	95.899	pg	91
11) Trichlorofluoromethane	0.00	101	0	N.D.		
12) 1,1-Dichloroethene	0.00	96	0	N.D.		
13) Methylene Chloride	7.35	84	373	15.830	pg	89
14) Trichlorotrifluoroethane	0.00	151	0	N.D.		
15) trans-1,2-Dichloroethene	0.00	96	0	N.D.		
16) 1,1-Dichloroethane	0.00	63	0	N.D.		
17) Methyl tert-Butyl Ether	0.00	73	0	N.D.		
18) cis-1,2-Dichloroethene	0.00	96	0	N.D.		
19) Chloroform	9.76	83	369	9.210	pg	97
21) 1,2-Dichloroethane	0.00	62	0	N.D.		
22) 1,1,1-Trichloroethane	0.00	97	0	N.D.		
23) Benzene	11.24	78	1074	10.838	pg	98
24) Carbon Tetrachloride	0.00	117	0	N.D.		
26) 1,2-Dichloropropane	0.00	63	0	N.D.		
27) Bromodichloromethane	0.00	83	0	N.D.		
28) Trichloroethene	0.00	130	0	N.D.		
29) 1,4-Dioxane	0.00	88	0	N.D.	d	
30) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
31) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
32) 1,1,2-Trichloroethane	0.00	83	0	N.D.		
34) Toluene	14.12	91	833	8.776	pg	99
35) Dibromochloromethane	0.00	129	0	N.D.		
36) 1,2-Dibromoethane	0.00	107	0	N.D.		
37) Tetrachloroethene	0.00	166	0	N.D.		
39) Chlorobenzene	0.00	112	0	N.D.		
40) Ethylbenzene	16.36	91	94	0.910	pg	# 41
41) m,p-Xylene	16.56	91	217	2.796	pg	95
42) Styrene	0.00	104	0	N.D.		
43) o-Xylene	0.00	106	0	N.D.		
44) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
46) 1,3,5-Trimethylbenzene	0.00	105	0	N.D.		
47) 1,2,4-Trimethylbenzene	18.67	105	51	0.584	pg	# 21
48) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
49) 1,4-Dichlorobenzene	18.89	146	63	1.064	pg	# 18
50) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
51) 1,2-Dibromo-3-chloropr...	0.00	157	0	N.D.		
52) 1,2,4-Trichlorobenzene	20.84	182	50	1.334	pg	# 46
53) Naphthalene	20.97	128	249	2.130	pg	# 71

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Data File : I:\MS19\DATA\2019 04\05\04051904.D
Acq On : 5 Apr 2019 5:56
Sample : MB S19040519 1000mL
Misc : S31-03161901

Vial: 1
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:24:05 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

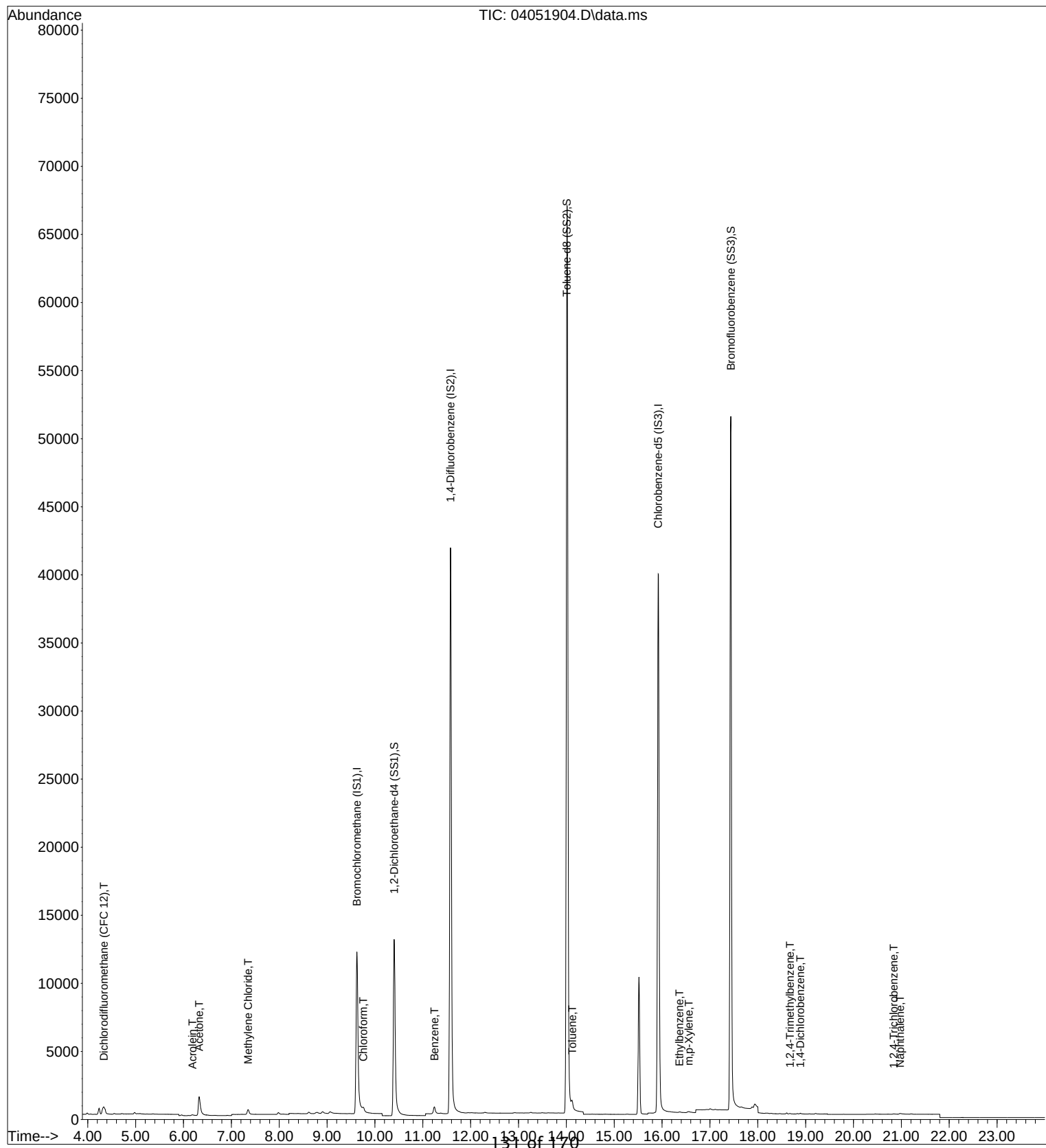
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	0.00	225	0	N.D.		

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

Data File : I:\MS19\DATA\2019 04\05\04051904.D
Acq On : 5 Apr 2019 5:56
Sample : MB S19040519 1000mL
Misc : S31-03161901

Vial: 1
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:24:05 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

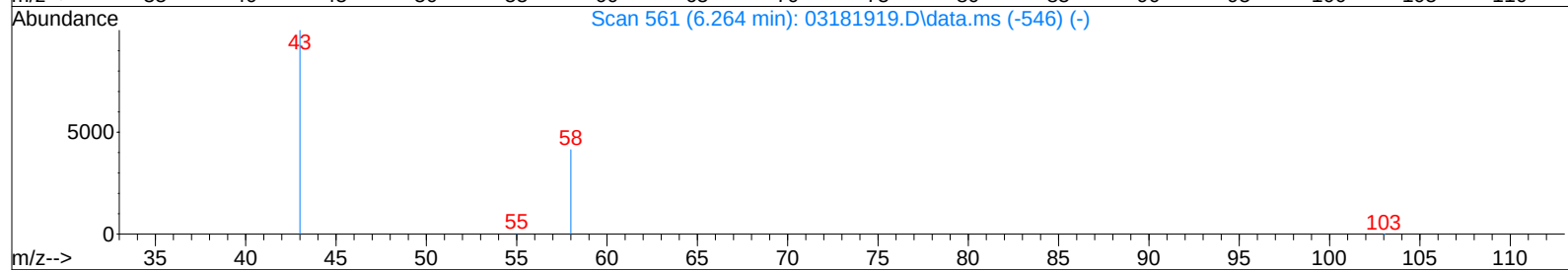
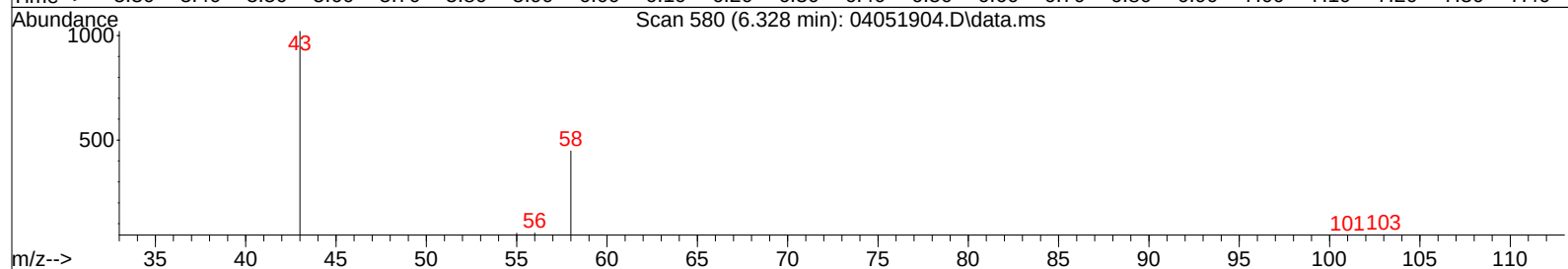
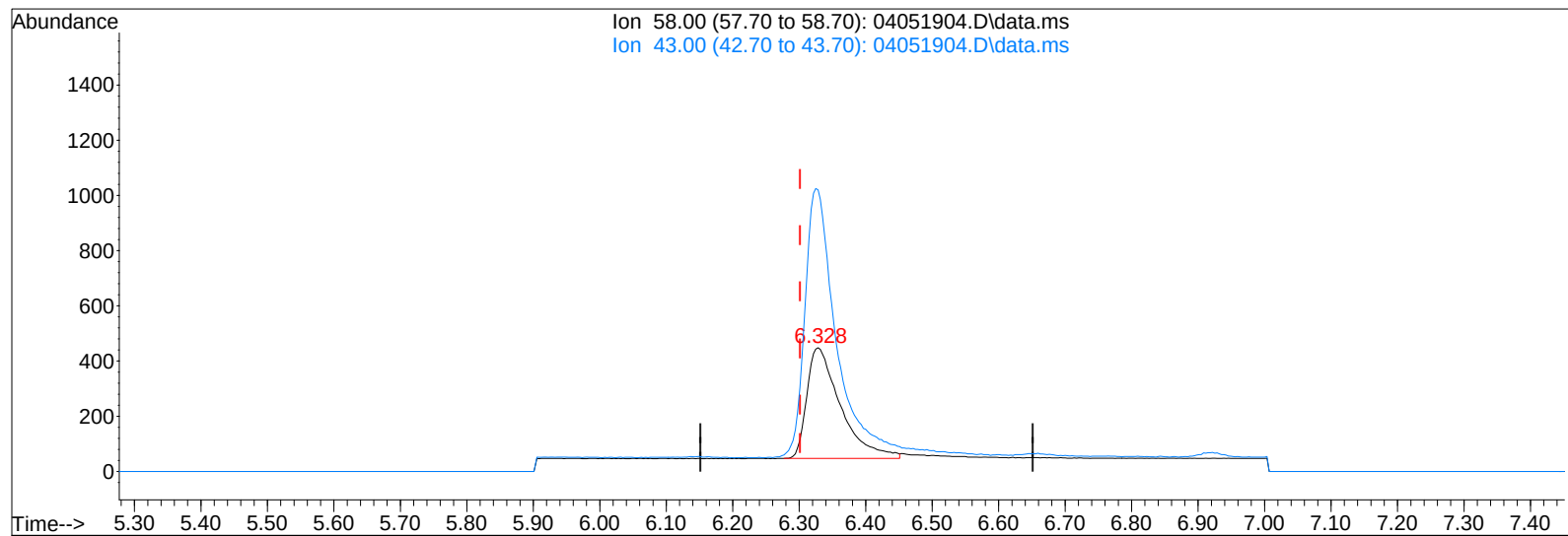


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Data File : I:\MS19\DATA\2019 04\05\04051904.D
Acq On : 5 Apr 2019 5:56
Sample : MB S19040519 1000mL
Misc : S31-03161901

Vial: 1
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:24:05 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051904.D\data.ms

(10) Acetone (T)

6.328min (+0.027) 95.90pg

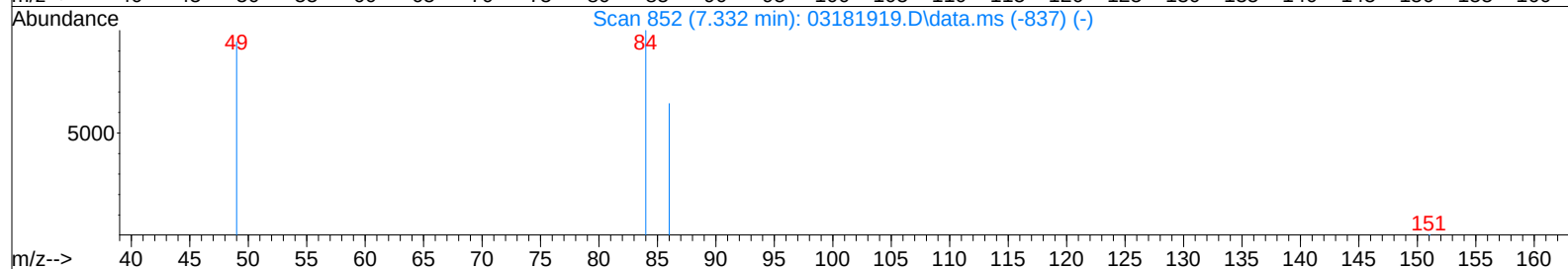
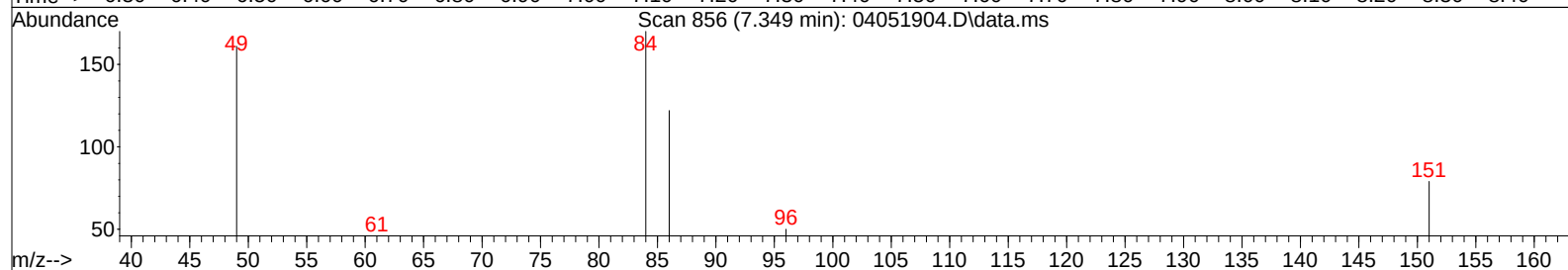
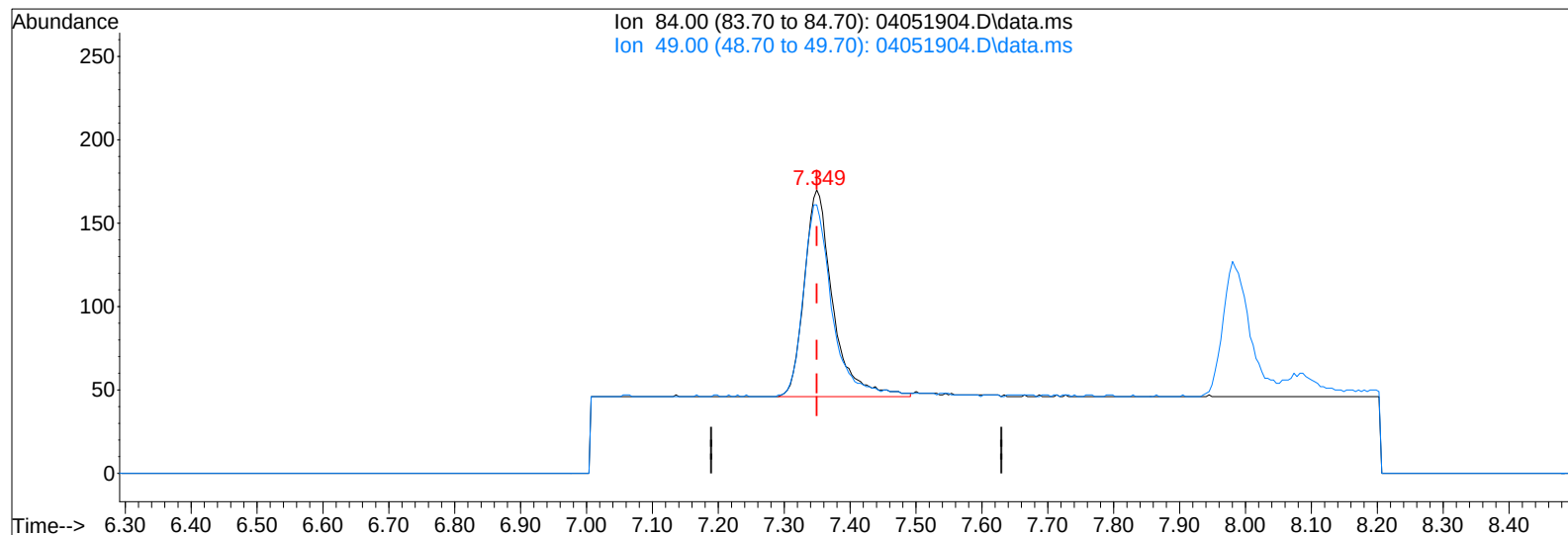
response 1411

Ion	Exp%	Act%
58.00	100	100
43.00	254.70	239.19
0.00	0.00	0.00
0.00	0.00	0.00

Data File : I:\MS19\DATA\2019 04\05\04051904.D
Acq On : 5 Apr 2019 5:56
Sample : MB S19040519 1000mL
Misc : S31-03161901

Vial: 1
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:24:05 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M



TIC: 04051904.D\data.ms

(13) Methylene Chloride (T)

7.349min (-0.000) 15.83pg

response 373

Ion	Exp%	Act%
84.00	100	100
49.00	103.30	91.96
0.00	0.00	0.00
0.00	0.00	0.00

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: WSP Group
Client Sample ID: Lab Control Sample
Client Project ID: Federal-Mogul - Former Huck Manufacturing / 31401678.006 Task 02.00

ALS Project ID: P1901824
ALS Sample ID: P190405-LCS

Test Code: EPA TO-15 SIM
Instrument ID: Tekmar AUTOCAN/Agilent 5973N/HP6890A/MS19
Analyst: Topacio De Leon
Sample Type: 6.0 L Summa Canister
Test Notes:

Date Collected: NA
Date Received: NA
Date Analyzed: 4/5/19
Volume(s) Analyzed: 0.125 Liter(s)

CAS #	Compound	Spike Amount µg/m ³	Result µg/m ³	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
156-59-2	cis-1,2-Dichloroethene	8.43	7.90	94	79-116	
79-01-6	Trichloroethene	8.54	7.99	94	79-116	
127-18-4	Tetrachloroethene	8.51	7.84	92	77-117	

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.

Data File : I:\MS19\DATA\2019 04\05\04051905.D
 Acq On : 5 Apr 2019 6:28
 Sample : LCS S19040519 1000pg
 Misc : S31-03161901/S31-03291901 (4/27)

Vial: 16
 Operator: TD
 Inst : MS19

Quant Time: Apr 05 08:22:27 2019

Quant Method : I:\MS19\METHODS\S19031819.M

Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

QLast Update : Tue Mar 19 06:44:10 2019

Response via : Initial Calibration

DataAcq Meth:TO15SIM.M

TD 4/5/19

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.62	130	22046	1000.000	pg	0.00
25) 1,4-Difluorobenzene (IS2)	11.58	114	98811	1000.000	pg	0.00
38) Chlorobenzene-d5 (IS3)	15.91	54	12514	1000.000	pg	0.00

System Monitoring Compounds

20) 1,2-Dichloroethane-d4 ...	10.40	65	25052	974.889	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	97.49%	
33) Toluene-d8 (SS2)	14.02	98	103055	1003.598	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	100.36%	
45) Bromofluorobenzene (SS3)	17.43	174	52000	1092.409	pg	0.00
Spiked Amount 1000.000	Range 70	- 130	Recovery	=	109.24%	

Target Compounds

						Qvalue
2) Dichlorodifluoromethan...	4.31	85	44564	976.111	pg	100
3) Chloromethane	4.52	52	9755	970.930	pg	100
4) 1,2-Dichloro,1,1,2,2-t...	4.69	85	28625	871.679	pg	100
5) Vinyl Chloride	4.82	62	26914	940.600	pg	99
6) 1,3-Butadiene	5.01	54	17890	846.641	pg	91
7) Bromomethane	5.33	94	19210	937.895	pg	100
8) Chloroethane	5.56	64	14191	977.033	pg	100
9) Acrolein	6.12	56	10281	924.468	pg	99
10) Acetone	6.26	58	69024	4269.260	pg	99
11) Trichlorofluoromethane	6.47	101	33957	970.348	pg	100
12) 1,1-Dichloroethene	7.20	96	28405	1135.482	pg	96
13) Methylene Chloride	7.33	84	25425	981.975	pg	90
14) Trichlorotrifluoroethane	7.66	151	22830	972.366	pg	100
15) trans-1,2-Dichloroethene	8.37	96	26833	1004.967	pg	99
16) 1,1-Dichloroethane	8.58	63	38398	1003.226	pg	100
17) Methyl tert-Butyl Ether	8.66	73	67305	1033.180	pg	98
18) cis-1,2-Dichloroethene	9.46	96	28059	988.057	pg	100
19) Chloroform	9.76	83	41095	933.433	pg	100
21) 1,2-Dichloroethane	10.51	62	25790	994.900	pg	100
22) 1,1,1-Trichloroethane	10.78	97	36392	992.958	pg	100
23) Benzene	11.23	78	107753	989.513	pg	99
24) Carbon Tetrachloride	11.39	117	32329	936.714	pg	100
26) 1,2-Dichloropropane	12.05	63	23239	1029.166	pg	100
27) Bromodichloromethane	12.22	83	31670	1013.019	pg	100
28) Trichloroethene	12.28	130	31258	998.891	pg	100
29) 1,4-Dioxane	12.25	88	21644	990.433	pg	94
30) cis-1,3-Dichloropropene	13.12	75	36078	1026.091	pg	100
31) trans-1,3-Dichloropropene	13.63	75	30125	1043.198	pg	100
32) 1,1,2-Trichloroethane	13.81	83	21073	1023.686	pg	99
34) Toluene	14.11	91	107149	983.037	pg	100
35) Dibromochloromethane	14.53	129	29140	1006.002	pg	100
36) 1,2-Dibromoethane	14.79	107	28926	1040.292	pg	100
37) Tetrachloroethene	15.27	166	32951	979.433	pg	100
39) Chlorobenzene	15.96	112	76551	1015.061	pg	100
40) Ethylbenzene	16.35	91	119244	1029.307	pg	99
41) m,p-Xylene	16.53	91	182308	2094.896	pg	100
42) Styrene	16.88	104	73301	1126.351	pg	100
43) o-Xylene	17.00	106	48521	1052.945	pg	99
44) 1,1,2,2-Tetrachloroethane	16.96	83	44300	1006.863	pg	100
46) 1,3,5-Trimethylbenzene	18.26	105	103899	1033.643	pg	100
47) 1,2,4-Trimethylbenzene	18.66	105	104360	1065.404	pg	100
48) 1,3-Dichlorobenzene	18.80	146	66678	1034.018	pg	100
49) 1,4-Dichlorobenzene	18.87	146	67297	1013.691	pg	100
50) 1,2-Dichlorobenzene	19.20	146	65640	1022.123	pg	100
51) 1,2-Dibromo-3-chloropr...	19.61	157	22757	1006.572	pg	96
52) 1,2,4-Trichlorobenzene	20.82	182	43168	1026.780	pg	99
53) Naphthalene	20.93	128	135770	1035.597	pg	100

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Data File : I:\MS19\DATA\2019 04\05\04051905.D Vial: 16
Acq On : 5 Apr 2019 6:28 Operator: TD
Sample : LCS S19040519 1000pg Inst : MS19
Misc : S31-03161901/S31-03291901 (4/27)

Quant Time: Apr 05 08:22:27 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M

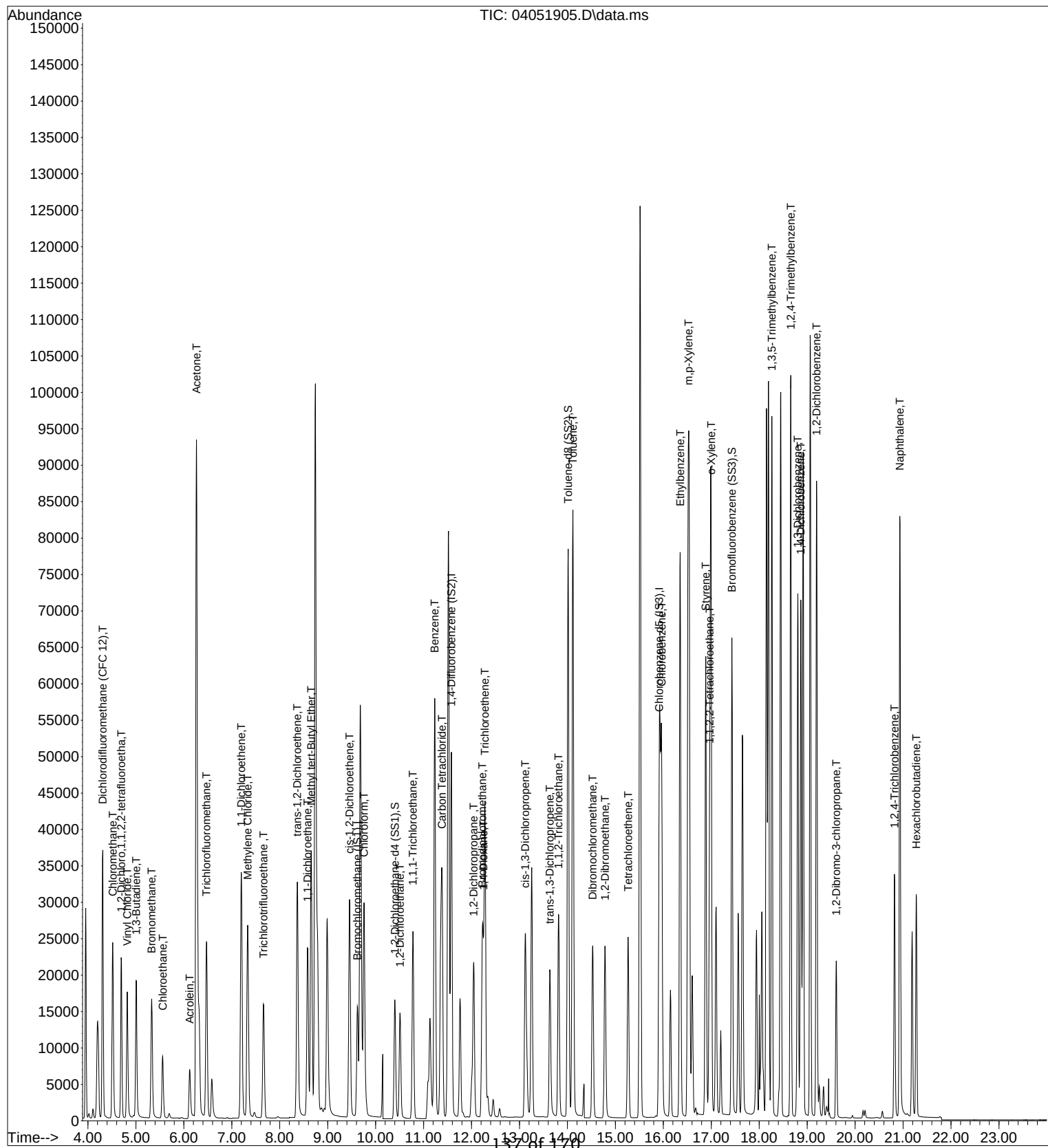
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
54) Hexachlorobutadiene	21.27	225	29384	918.420	pg	100

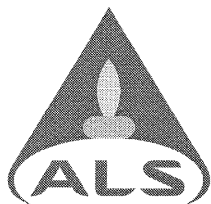
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File : I:\MS19\DATA\2019 04\05\04051905.D
Acq On : 5 Apr 2019 6:28
Sample : LCS S19040519 1000pg
Misc : S31-03161901/S31-03291901 (4/27)

Vial: 16
Operator: TD
Inst : MS19

Quant Time: Apr 05 08:22:27 2019
Quant Method : I:\MS19\METHODS\S19031819.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Tue Mar 19 06:44:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15SIM.M





Instructions for Data Validation-Method TO-15 (SCAN)

Page 1 of 3

1. Determination of Pressure Dilution Factor

Upon receipt at the laboratory the pressure or vacuum of the sample canisters is measured using a digital pressure gauge. The canisters are then pressurized with humidified zero air to approximately +3.5 psig (pounds per square inch gauge).

Pressure Dilution factor is calculated as:

$$PDF = \frac{P_f + 14.7}{P_i + 14.7}$$

P_f final pressure in psig

P_i initial pressure in psig

2. Validating Initial and Continuing Calibration Results

GC/MS target compound analysis is performed using internal standard quantitation. Three internal standard compounds (Bromochloromethane, 1,4-Difluorobenzene and Chlorobenzene-d5) are added to each aliquot of sample, blank, standard and duplicate at an amount of 25 nanograms(ng). Internal standard responses are used to calculate RRFs (relative response factors) as follows:

$$RRF = \frac{A_x C_{is}}{A_{is} C_x}$$

A_x area response of the analyte quantitation ion

A_{is} area response of the corresponding internal standard quantitation ion

C_{is} internal standard concentration, ng

C_x analyte concentration, ng

The percent relative standard deviation (%RSD) for the five or six initial calibration points should be less than 30% (with a maximum of two analytes $\leq 40\%$) for the calibration to be considered valid and linear.

$$\%RSD = \frac{SD}{\overline{RRF}}(100)$$

SD standard deviation

$\overline{RRF}$ average or mean RRF (ICAL)



Instructions for Data Validation-Method TO-15 (SCAN)

Page 2 of 3

The initial calibration is verified once per twenty-four hour analytical sequence with the analysis of a continuing calibration standard at one of the initial calibration levels (actual analyte concentrations of the CCV are the same as the corresponding concentrations in the initial calibration). The relative response factor of each target analyte from the daily continuing calibration standard is compared to the average relative response factor from the initial multipoint calibration. The percent difference (%D) of the initial and continuing calibration relative response factors is calculated as follows:

$$\%D = \left(\frac{\overline{RRF} - RRF_{cont}}{\overline{RRF}} \right) (100)$$

$\overline{RRF}$ average relative response factor from the initial calibration

RRF_{cont} relative response factor from the daily continuing calibration standard

Note: the percent difference (%D) should be less than 30% for an acceptable continuing calibration standard.

3. Validating GC/MS Target Analyte Quantitation Results

Target analytes are measured in nanograms using internal standard quantitation as follows:

$$ng_x = \frac{A_x ng_{is}}{A_{is} \overline{RRF}}$$

ng_x nanogram concentration of analyte x

A_x area response of the analyte's quantitation ion

A_{is} area response of the corresponding internal standard's quantitation ion

ng_{is} internal standard amount, in nanograms

$\overline{RRF}$ average or mean RRFs (ICAL)



Instructions for Data Validation-Method TO-15 (SCAN)

Page 3 of 3

4. Calculation of $\mu\text{g}/\text{m}^3$ (microgram per cubic meter) Results

Target compound results reported on the "Results of Analysis" form in units of $\mu\text{g}/\text{m}^3$ are calculated as follows:

$$\mu\text{g}/\text{m}^3 = \frac{(ng)(PDF)}{L}$$

ng nanograms of analyte (measured on the GC/MS quantitation report)

PDF pressure dilution factor (see equation 1)

L sample aliquot in Liters

5. Conversion to ppb (parts per billion) Volume

$$C_{ppbv} = C_x \left(\frac{24.46}{FW} \right)$$

FW formula weight of the target analytes (i.e. formula weight of Dichloromethane is 84.94; 1,2-Dichloropropane is 113)

24.46 molar volume of ideal gas at 25°C and 1 atmosphere

C_x final analyte concentration calculated in equation 4 ($\mu\text{g}/\text{m}^3$)

Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141915.D
 Acq On : 14 Mar 2019 17:12
 Operator : RVT
 Sample : AC02421
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 3 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:08 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	52497	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	179586	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	145896	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	76855	911.882	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.19%	
57) Toluene-d8 (SS2)	12.61	98	180902	927.946	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.80%	
74) Bromofluorobenzene (SS3)	16.14	174	45966	1229.449	pg	0.00
Spiked Amount 1000.000			Recovery	=	122.95%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	1898	21.133	pg	# 32
3) * Dichlorodifluoromethane	3.58	85	1546	7.956	pg	98
4) * Chloromethane	3.70	50	958	9.442	pg	93
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	60	0.478	pg	# 42
7) * 1,3-Butadiene	4.00	54	196	2.715	pg	# 1
8) * Bromomethane	4.21	94	73	0.940	pg	# 3
9) * Chloroethane	4.35	64	109	2.256	pg	# 41
10) * Ethanol	4.43	45	1981	48.479	pg	94
11) * Acetonitrile	4.60	41	666	7.316	pg	# 84
12) * Acrolein	4.71	56	1812	34.968	pg	97
13) * Acetone	4.84	58	9986	141.685	pg	# 59
14) * Trichlorofluoromethane	4.95	101	554	4.255	pg	95
15) * 2-Propanol (Isopropa...	5.02	45	1474	10.807	pg	93
16) * Acrylonitrile	5.18	53	309	3.474	pg	86
18) tert-Butanol	5.55	59	498	6.280	pg	88
19) * Methylene Chloride	5.56	84	400	5.251	pg	96
21) * Trichlorotrifluoroet...	5.81	151	114	1.893	pg	# 18
22) * Carbon Disulfide	5.83	76	2002	9.459	pg	98
26) * Vinyl Acetate	6.70	86	222	19.383	pg	# 21
27) * 2-Butanone (MEK)	6.97	72	496	11.629	pg	72
29) DIPE	7.63	45	958	4.756	pg	# 49
30) * Ethyl Acetate	7.63	61	1044	66.389	pg	# 75
31) * n-Hexane	7.63	57	175	1.773	pg	# 60
34) * Tetrahydrofuran	8.14	71	111	3.219	pg	# 1
39) * Benzene	9.33	78	1177	4.700	pg	91
41) 1-Butanol	9.28	56	18881	37.571	pg	95
42) * Carbon Tetrachloride	9.52	117	136	2.736	pg	# 42
48) * 1,4-Dioxane	10.63	88	117	2.547	pg	# 14
49) Isooctane	10.72	56	243	2.438	pg	# 19
51) * n-Heptane	11.01	71	323	4.051	pg	92
53) * 4-Methyl-2-pentanone	11.71	58	99	2.648	pg	# 42
58) * Toluene	12.72	91	2023	7.933	pg	98
59) * 2-Hexanone	13.06	58	72	2.695	pg	# 64
63) * n-Octane	13.92	85	74	1.954	pg	93
64) * Tetrachloroethene	14.03	166	223	3.673	pg	90
66) * Ethylbenzene	15.14	91	284	1.378	pg	90
67) * m- & p-Xylenes	15.30	91	774	4.988	pg	96
70) * Styrene	15.63	104	86	1.046	pg	# 29
71) * o-Xylene	15.73	91	327	2.003	pg	97
72) * n-Nonane	15.98	57	202	2.958	pg	# 87
75) * Cumene	16.27	105	52	0.279	pg	# 50
76) * alpha-Pinene	16.61	93	121	1.308	pg	91
77) * n-Propylbenzene	16.72	91	117	0.605	pg	# 35
78) 3-Ethyltoluene	16.85	105	74	0.493	pg	# 44
79) * 4-Ethyltoluene	16.85	105	74	0.547	pg	# 46

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141915.D
 Acq On : 14 Mar 2019 17:12
 Operator : RVT
 Sample : AC02421
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 3 Sample Multiplier: 1

Quant Time: Mar 15 07:51:08 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
80) * 1,3,5-Trimethylbenzene	16.91	105	94	0.695	pg	# 30
82) 2-Ethyltoluene	17.07	105	91	0.565	pg	# 45
83) tert-Butylbenzene	17.29	134	142	4.700	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	347	2.680	pg	# 98
86) * 1,3-Dichlorobenzene	17.43	146	67	1.120	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	67	1.304	pg	# 18
90) 1,2,3-Trimethylbenzene	17.61	105	140	1.063	pg	# 49
91) p-Isopropyltoluene	17.63	134	133	3.281	pg	# 99
93) * D-Limonene	17.74	68	247	5.208	pg	# 68
96) n-Undecane	18.41	85	154	12.970	pg	# 1
98) * Naphthalene	19.29	128	84	2.900	pg	# 67

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

Data Path : I:\MS21\DATA\2019 03\14\

Data File : 03141915.D

Acq On : 14 Mar 2019 17:12

Operator : RVT

Sample : AC02421

Misc : 97600 (Sig #1); S31-02281901 (Sig #2)

ALS Vial : 3 Sample Multiplier: 1

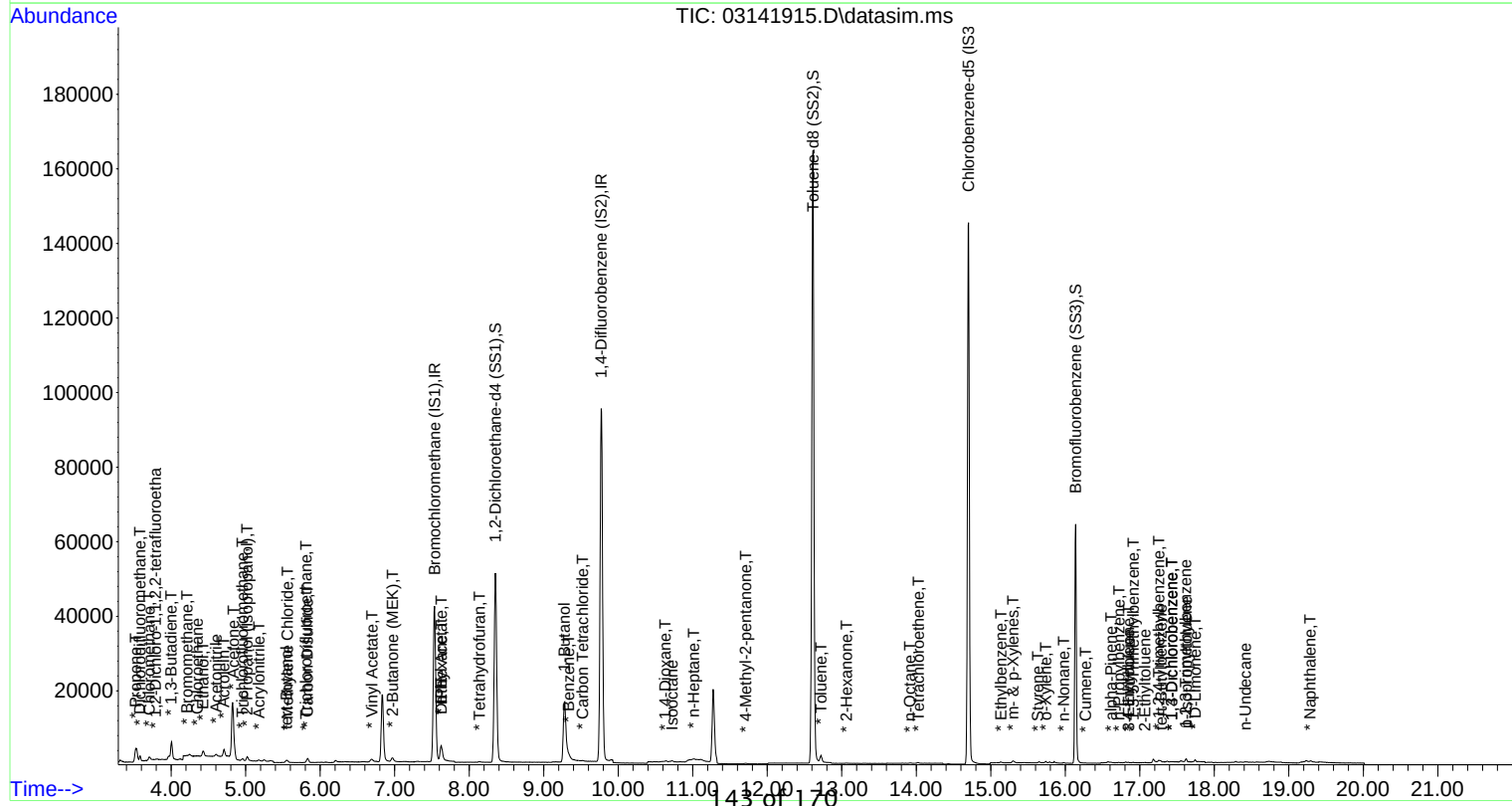
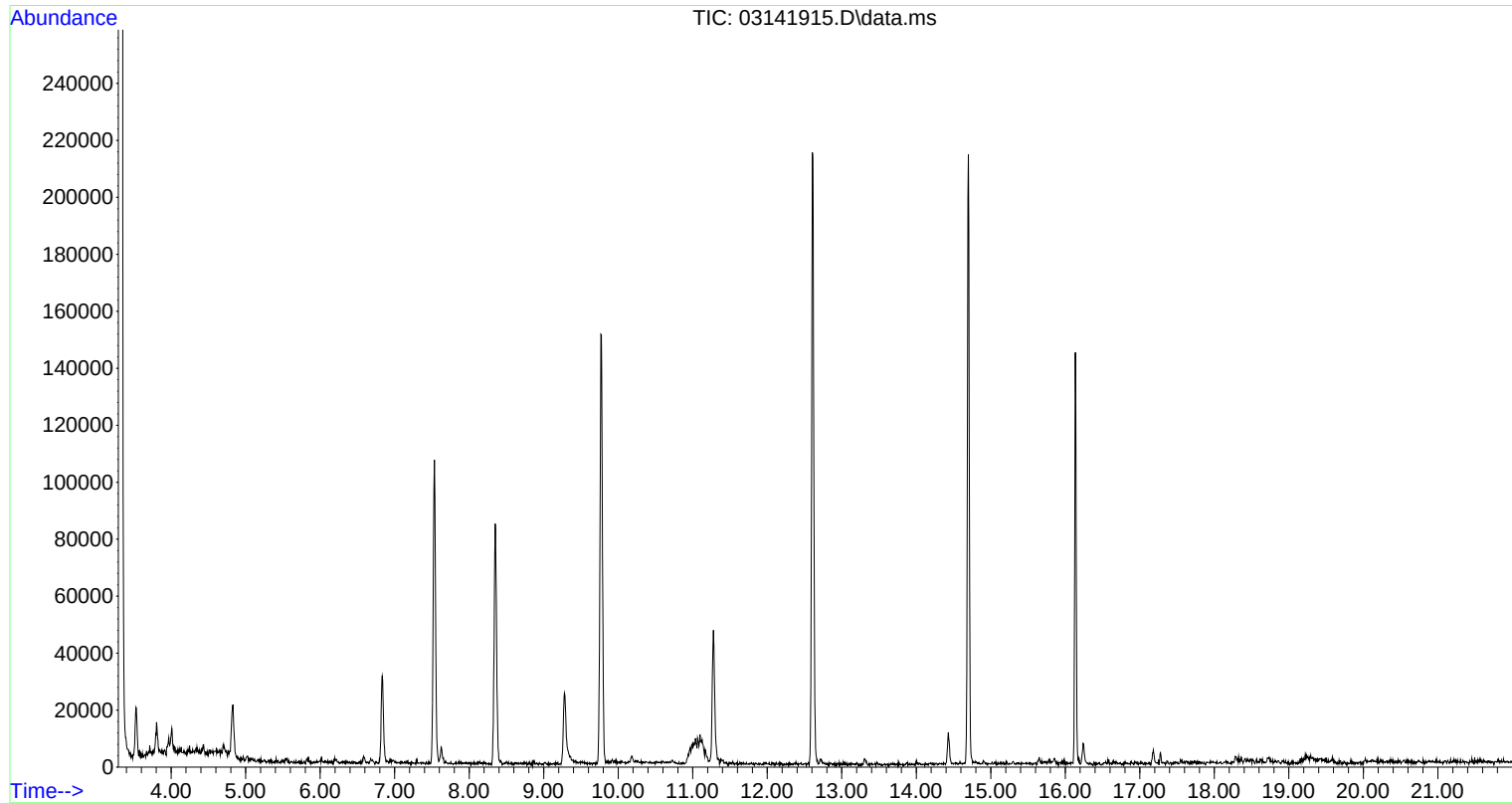
Quant Time: Mar 15 07:51:08 2019

Quant Method : I:\MS21\Methods\F21030819.M

Quant Title : EPA TO-15

QLast Update : Mon Mar 11 09:36:38 2019

Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141917.D
 Acq On : 14 Mar 2019 18:36
 Operator : RVT
 Sample : AC02455
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 5 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:20 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	50433	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	173632	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	141153	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	73598	908.976	pg	0.00
Spiked Amount 1000.000			Recovery	=	90.90%	
57) Toluene-d8 (SS2)	12.61	98	174080	922.957	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.30%	
74) Bromofluorobenzene (SS3)	16.14	174	44331	1225.560	pg	0.00
Spiked Amount 1000.000			Recovery	=	122.56%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	1740	20.167	pg	# 39
3) * Dichlorodifluoromethane	3.58	85	577	3.091	pg	95
4) * Chloromethane	3.71	50	652	6.689	pg	# 88
7) * 1,3-Butadiene	3.99	54	153	2.206	pg	# 1
8) * Bromomethane	4.20	94	61	0.817	pg	# 17
10) * Ethanol	4.43	45	2276	57.978	pg	92
11) * Acetonitrile	4.60	41	437	4.997	pg	89
12) * Acrolein	4.71	56	1742	34.993	pg	93
13) * Acetone	4.82	58	9690	143.112	pg	# 65
14) * Trichlorofluoromethane	4.96	101	208	1.663	pg	91
15) * 2-Propanol (Isopropa...	5.03	45	949	7.242	pg	90
16) * Acrylonitrile	5.18	53	296	3.464	pg	90
18) tert-Butanol	5.54	59	520	6.826	pg	84
19) * Methylene Chloride	5.56	84	652	8.909	pg	98
21) * Trichlorotrifluoroet...	5.80	151	65	1.123	pg	# 18
22) * Carbon Disulfide	5.83	76	1691	8.317	pg	98
26) * Vinyl Acetate	6.70	86	94	8.543	pg	# 1
27) * 2-Butanone (MEK)	6.97	72	614	14.984	pg	76
29) DIPE	7.62	45	645	3.333	pg	# 49
30) * Ethyl Acetate	7.63	61	590	39.054	pg	82
31) * n-Hexane	7.62	57	154	1.624	pg	# 60
34) * Tetrahydrofuran	8.14	71	131	3.954	pg	87
39) * Benzene	9.34	78	753	3.110	pg	91
41) 1-Butanol	9.28	56	17068	35.128	pg	95
47) * Trichloroethene	10.62	130	270	4.422	pg	93
48) * 1,4-Dioxane	10.64	88	254	5.719	pg	95
49) Isooctane	10.73	56	242	2.511	pg	# 21
51) * n-Heptane	11.02	71	99	1.284	pg	# 40
53) * 4-Methyl-2-pentanone	11.71	58	119	3.292	pg	# 42
58) * Toluene	12.72	91	2184	8.852	pg	98
59) * 2-Hexanone	13.07	58	88	3.404	pg	# 64
63) * n-Octane	13.92	85	90	2.456	pg	# 79
65) * Chlorobenzene	14.75	112	53	0.396	pg	# 43
66) * Ethylbenzene	15.13	91	321	1.609	pg	# 86
67) * m- & p-Xylenes	15.30	91	1007	6.707	pg	96
69) Cyclohexanone	15.45	98	60	3.572	pg	96
70) * Styrene	15.64	104	97	1.220	pg	# 85
71) * o-Xylene	15.74	91	352	2.229	pg	93
72) * n-Nonane	15.98	57	196	2.967	pg	98
76) * alpha-Pinene	16.61	93	163	1.821	pg	90
77) * n-Propylbenzene	16.72	91	148	0.791	pg	# 55
78) 3-Ethyltoluene	16.81	105	263	1.811	pg	98
79) * 4-Ethyltoluene	16.84	105	147	1.123	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.91	105	103	0.787	pg	89
81) alpha-Methylstyrene	17.04	118	166	3.517	pg	95

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141917.D
 Acq On : 14 Mar 2019 18:36
 Operator : RVT
 Sample : AC02455
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 5 Sample Multiplier: 1

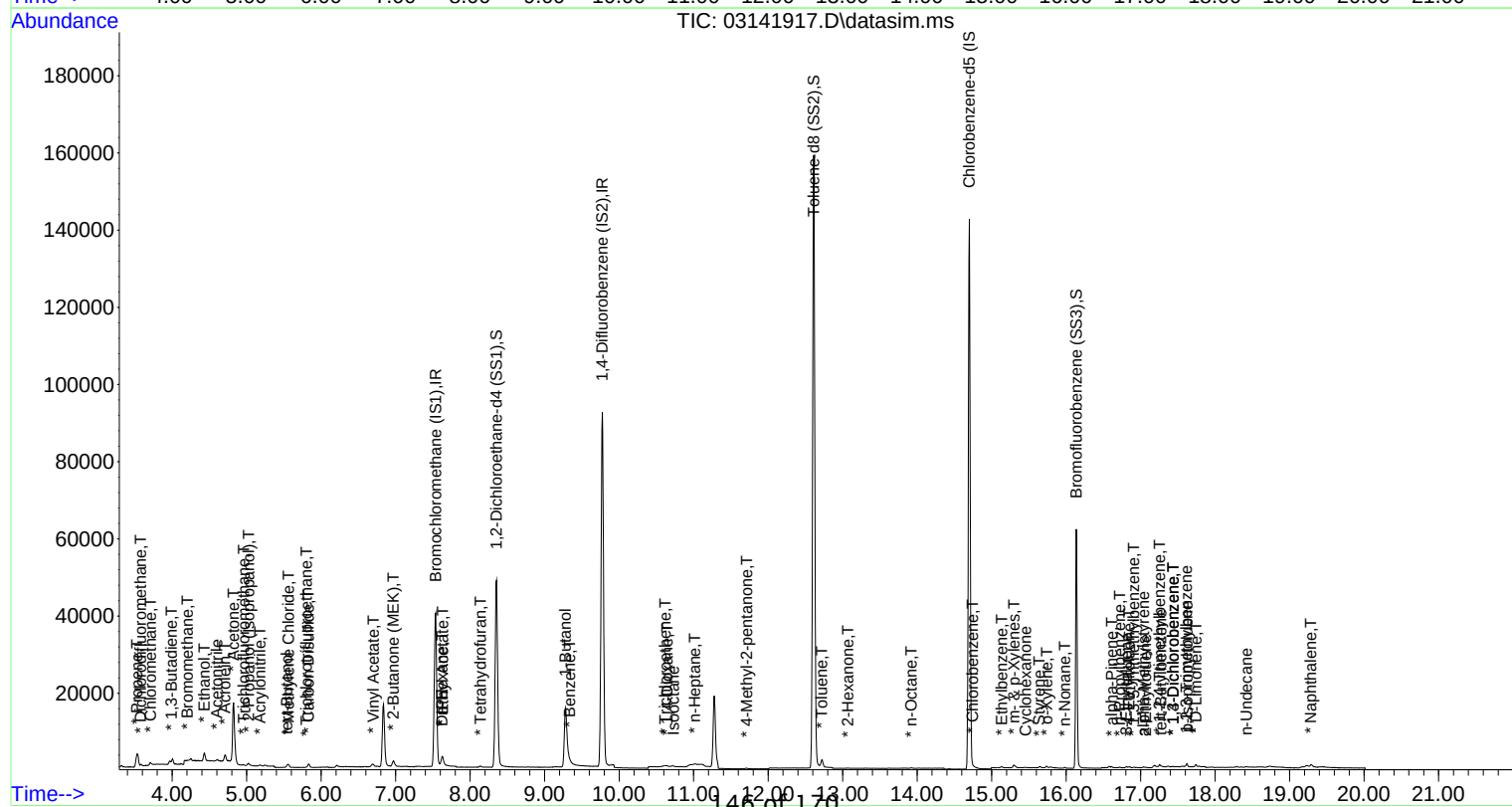
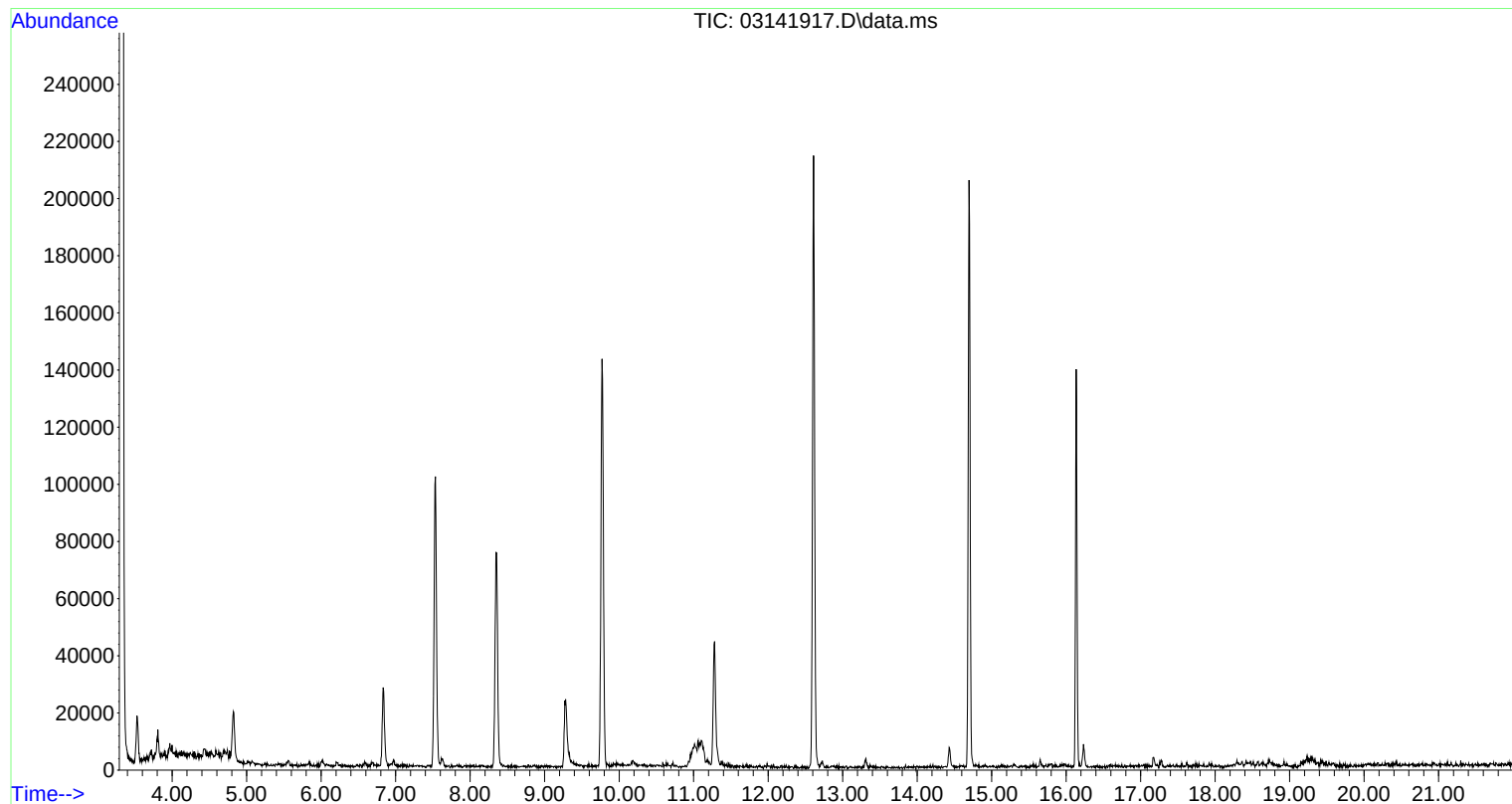
Quant Time: Mar 15 07:51:20 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
82) 2-Ethyltoluene	17.07	105	117	0.751	pg	# 45
83) tert-Butylbenzene	17.27	134	87	2.977	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	409	3.265	pg	99
86) * 1,3-Dichlorobenzene	17.43	146	80	1.382	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	80	1.609	pg	# 18
90) 1,2,3-Trimethylbenzene	17.61	105	149	1.169	pg	# 83
91) p-Isopropyltoluene	17.62	134	139	3.544	pg	87
93) * D-Limonene	17.74	68	265	5.775	pg	91
96) n-Undecane	18.42	85	164	14.276	pg	# 1
98) * Naphthalene	19.28	128	485	17.304	pg	# 88

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

Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141917.D
 Acq On : 14 Mar 2019 18:36
 Operator : RVT
 Sample : AC02455
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 5 Sample Multiplier: 1

Quant Time: Mar 15 07:51:20 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration



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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141924.D
 Acq On : 14 Mar 2019 23:32
 Operator : RVT
 Sample : AC01830
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 12 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:52:02 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	53846	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	180293	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	145904	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	78556	908.713	pg	0.00
Spiked Amount 1000.000			Recovery	=	90.87%	
57) Toluene-d8 (SS2)	12.61	98	179407	920.227	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.02%	
74) Bromofluorobenzene (SS3)	16.14	174	46177	1235.025	pg	0.00
Spiked Amount 1000.000			Recovery	=	123.50%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	1948	21.147	pg	# 25
3) * Dichlorodifluoromethane	3.58	85	2539	12.739	pg	98
4) * Chloromethane	3.71	50	1219	11.714	pg	88
5) * 1,2-Dichloro-1,1,2,2...	3.80	85	61	0.474	pg	# 42
7) * 1,3-Butadiene	3.99	54	198	2.674	pg	# 1
8) * Bromomethane	4.21	94	133	1.669	pg	# 3
10) * Ethanol	4.43	45	2475	59.051	pg	92
11) * Acetonitrile	4.60	41	996	10.667	pg	# 84
12) * Acrolein	4.71	56	2047	38.513	pg	95
13) * Acetone	4.83	58	11161	154.389	pg	# 58
14) * Trichlorofluoromethane	4.96	101	1031	7.720	pg	99
15) * 2-Propanol (Isopropa...	5.02	45	1578	11.279	pg	100
16) * Acrylonitrile	5.18	53	364	3.990	pg	92
18) tert-Butanol	5.54	59	634	7.795	pg	88
19) * Methylene Chloride	5.56	84	1422	18.199	pg	98
21) * Trichlorotrifluoroet...	5.81	151	195	3.156	pg	89
22) * Carbon Disulfide	5.83	76	1693	7.799	pg	99
26) * Vinyl Acetate	6.69	86	203	17.280	pg	83
27) * 2-Butanone (MEK)	6.97	72	1129	25.806	pg	98
29) DIPE	7.63	45	1813	8.775	pg	# 49
30) * Ethyl Acetate	7.62	61	1804	111.845	pg	86
31) * n-Hexane	7.62	57	269	2.656	pg	# 60
32) * Chloroform	7.66	83	84	0.693	pg	# 17
34) * Tetrahydrofuran	8.14	71	116	3.279	pg	# 69
39) * Benzene	9.34	78	1327	5.278	pg	95
41) 1-Butanol	9.28	56	17821	35.322	pg	93
42) * Carbon Tetrachloride	9.52	117	203	4.068	pg	97
47) * Trichloroethene	10.61	130	909	14.338	pg	99
48) * 1,4-Dioxane	10.64	88	203	4.402	pg	# 74
49) Isooctane	10.71	56	293	2.928	pg	# 30
51) * n-Heptane	11.02	71	235	2.936	pg	90
53) * 4-Methyl-2-pentanone	11.70	58	93	2.478	pg	# 42
58) * Toluene	12.72	91	4379	17.171	pg	98
59) * 2-Hexanone	13.06	58	67	2.507	pg	# 64
63) * n-Octane	13.93	85	62	1.637	pg	# 65
66) * Ethylbenzene	15.14	91	542	2.629	pg	# 88
67) * m- & p-Xylenes	15.30	91	1546	9.962	pg	93
70) * Styrene	15.65	104	84	1.022	pg	# 79
71) * o-Xylene	15.74	91	520	3.186	pg	95
72) * n-Nonane	15.98	57	158	2.314	pg	# 85
76) * alpha-Pinene	16.61	93	162	1.751	pg	# 80
77) * n-Propylbenzene	16.72	91	119	0.615	pg	# 51
78) 3-Ethyltoluene	16.81	105	194	1.292	pg	94
79) * 4-Ethyltoluene	16.84	105	94	0.695	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.92	105	100	0.739	pg	# 30

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141924.D
 Acq On : 14 Mar 2019 23:32
 Operator : RVT
 Sample : AC01830
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 12 Sample Multiplier: 1

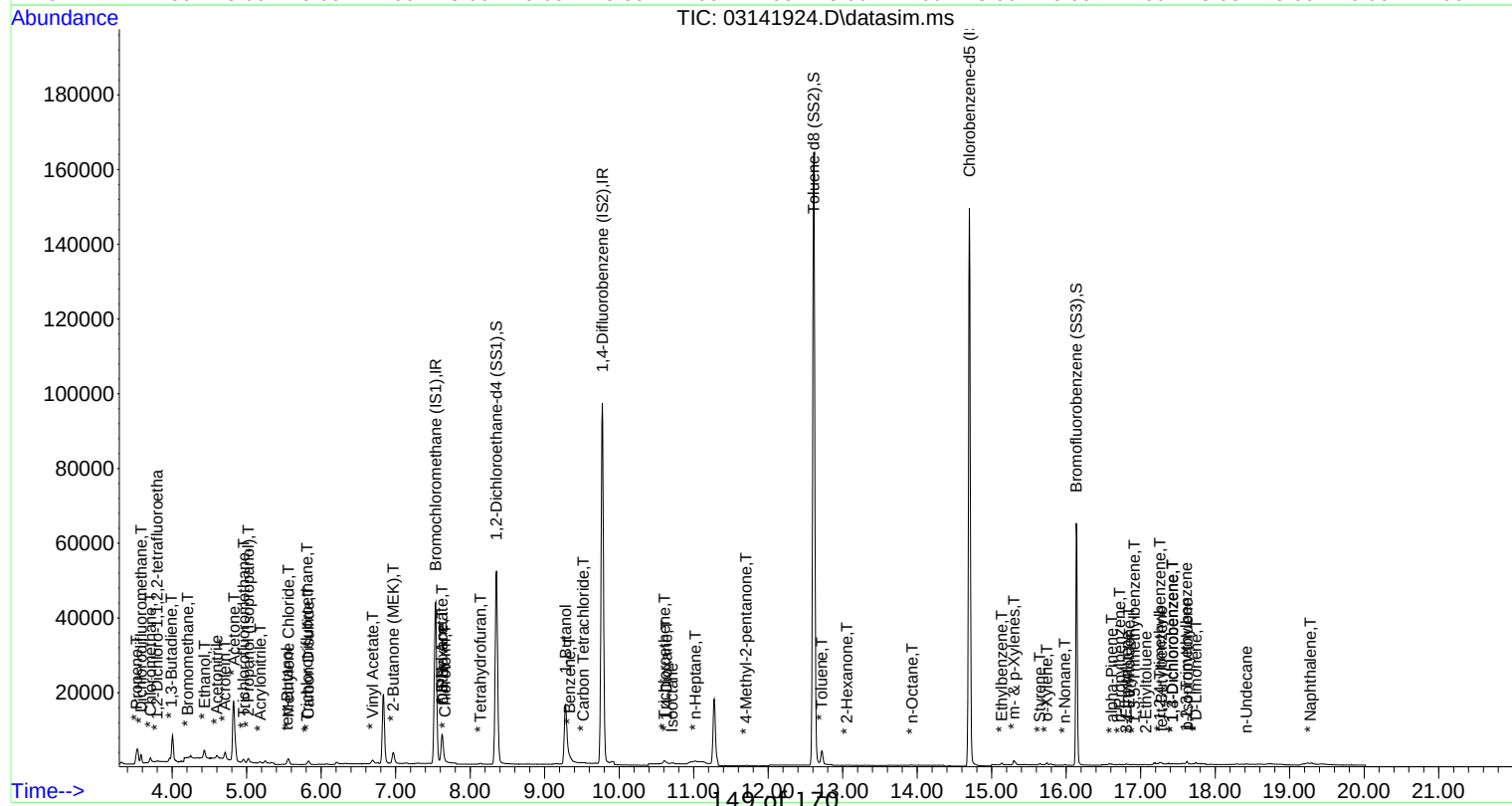
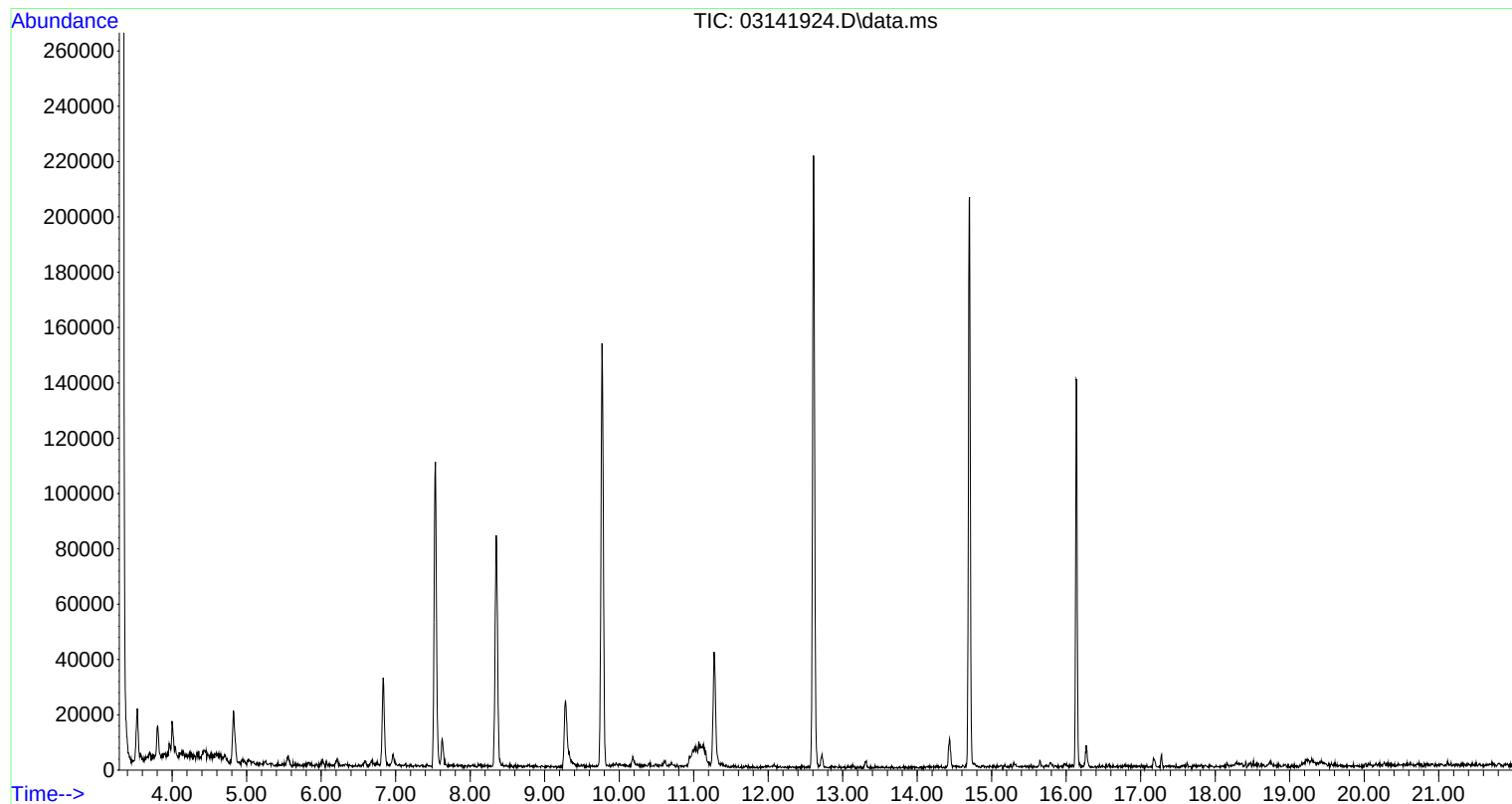
Quant Time: Mar 15 07:52:02 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
82) 2-Ethyltoluene	17.07	105	66	0.410	pg	# 45
83) tert-Butylbenzene	17.28	134	137	4.535	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	311	2.402	pg	97
86) * 1,3-Dichlorobenzene	17.43	146	71	1.187	pg	89
87) * 1,4-Dichlorobenzene	17.43	146	71	1.382	pg	88
90) 1,2,3-Trimethylbenzene	17.61	105	124	0.941	pg	# 74
91) p-Isopropyltoluene	17.62	134	124	3.059	pg	69
93) * D-Limonene	17.74	68	181	3.816	pg	98
96) n-Undecane	18.42	85	60	5.053	pg	# 6
98) * Naphthalene	19.28	128	60	2.071	pg	# 67

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

Data Path : I:\MS21\DATA\2019 03\14\
Data File : 03141924.D
Acq On : 14 Mar 2019 23:32
Operator : RVT
Sample : AC01830
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Mar 15 07:52:02 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141918.D
 Acq On : 14 Mar 2019 19:18
 Operator : RVT
 Sample : AC02456
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 6 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:26 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.53	130	51637	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	178972	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	138094	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	75788	914.198	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.42%	
57) Toluene-d8 (SS2)	12.61	98	170172	922.223	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.22%	
74) Bromofluorobenzene (SS3)	16.14	174	42857	1211.055	pg	0.00
Spiked Amount 1000.000			Recovery	=	121.11%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	1812	20.512	pg	# 36
3) * Dichlorodifluoromethane	3.58	85	638	3.338	pg	96
4) * Chloromethane	3.70	50	905	9.068	pg	93
7) * 1,3-Butadiene	4.00	54	206	2.901	pg	# 1
8) * Bromomethane	4.21	94	76	0.994	pg	# 3
9) * Chloroethane	4.34	64	202	4.250	pg	# 87
10) * Ethanol	4.43	45	1493	37.145	pg	90
11) * Acetonitrile	4.60	41	758	8.465	pg	# 69
12) * Acrolein	4.71	56	2326	45.635	pg	92
13) * Acetone	4.83	58	15372	221.736	pg	# 55
14) * Trichlorofluoromethane	4.96	101	266	2.077	pg	97
15) * 2-Propanol (Isopropa...	5.02	45	1305	9.727	pg	90
16) * Acrylonitrile	5.18	53	363	4.150	pg	95
18) tert-Butanol	5.55	59	693	8.885	pg	99
19) * Methylene Chloride	5.56	84	453	6.045	pg	87
22) * Carbon Disulfide	5.83	76	1796	8.627	pg	# 94
26) * Vinyl Acetate	6.70	86	341	30.269	pg	# 22
27) * 2-Butanone (MEK)	6.97	72	1312	31.272	pg	86
29) DIPE	7.63	45	458	2.312	pg	# 49
30) * Ethyl Acetate	7.63	61	455	29.416	pg	95
31) * n-Hexane	7.62	57	184	1.895	pg	# 60
34) * Tetrahydrofuran	8.14	71	50	1.474	pg	92
39) * Benzene	9.34	78	819	3.281	pg	94
41) 1-Butanol	9.28	56	22982	45.888	pg	89
47) * Trichloroethene	10.61	130	472	7.500	pg	98
48) * 1,4-Dioxane	10.64	88	249	5.439	pg	87
49) Isooctane	10.73	56	304	3.061	pg	# 1
51) * n-Heptane	11.02	71	57	0.717	pg	# 40
53) * 4-Methyl-2-pentanone	11.71	58	234	6.281	pg	98
58) * Toluene	12.72	91	1293	5.357	pg	100
63) * n-Octane	13.92	85	58	1.618	pg	# 52
65) * Chlorobenzene	14.75	112	58	0.443	pg	# 43
66) * Ethylbenzene	15.14	91	197	1.010	pg	94
67) * m- & p-Xylenes	15.29	91	541	3.683	pg	93
71) * o-Xylene	15.73	91	234	1.515	pg	95
72) * n-Nonane	15.98	57	125	1.934	pg	# 87
75) * Cumene	16.28	105	51	0.289	pg	# 50
77) * n-Propylbenzene	16.72	91	140	0.765	pg	# 55
78) 3-Ethyltoluene	16.81	105	108	0.760	pg	# 44
79) * 4-Ethyltoluene	16.91	105	59	0.461	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.91	105	59	0.461	pg	# 30
83) tert-Butylbenzene	17.28	134	50	1.749	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	196	1.600	pg	90
90) 1,2,3-Trimethylbenzene	17.61	105	61	0.489	pg	# 32
91) p-Isopropyltoluene	17.62	134	74	1.929	pg	82

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141918.D
 Acq On : 14 Mar 2019 19:18
 Operator : RVT
 Sample : AC02456
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 6 Sample Multiplier: 1

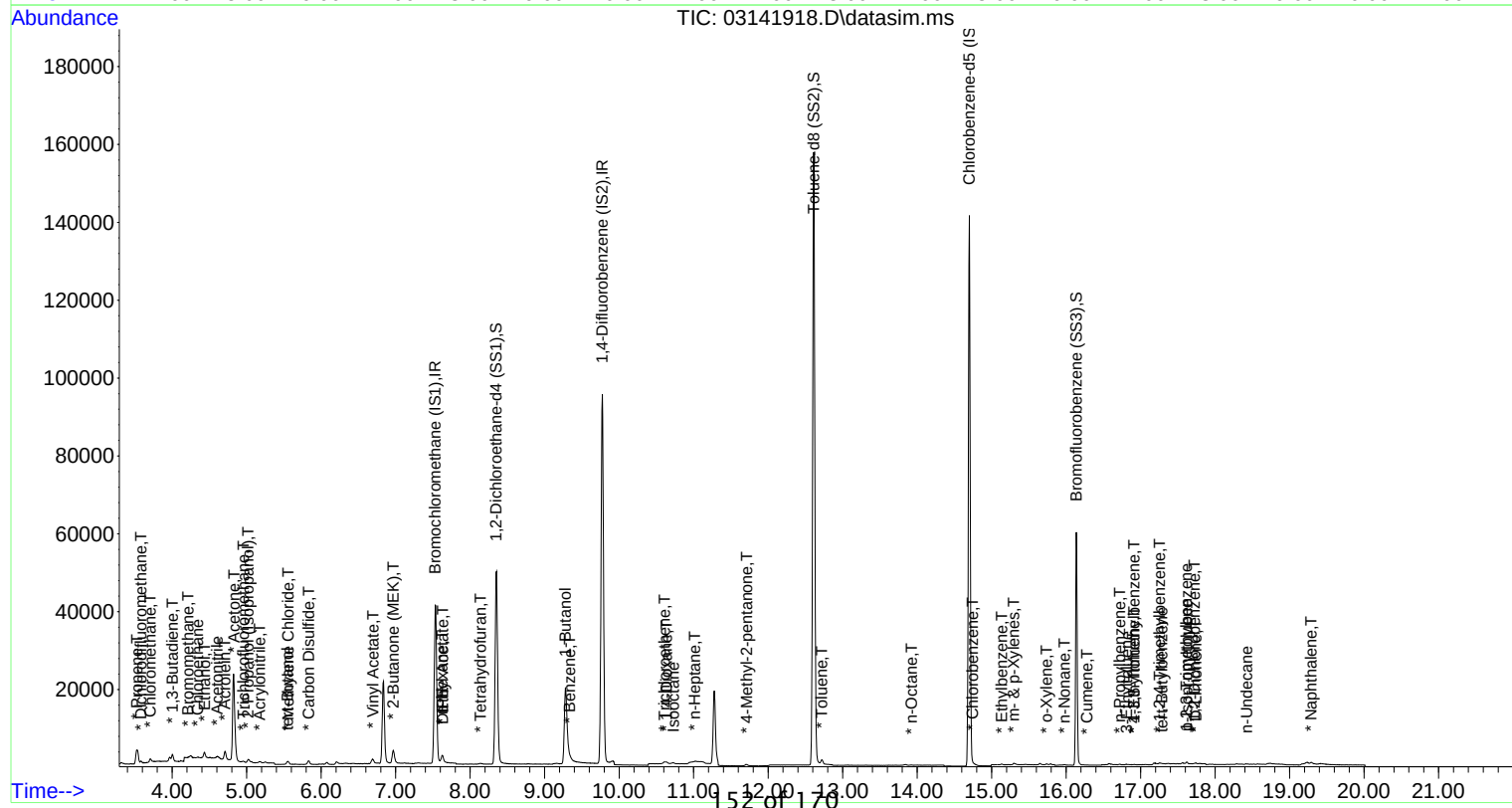
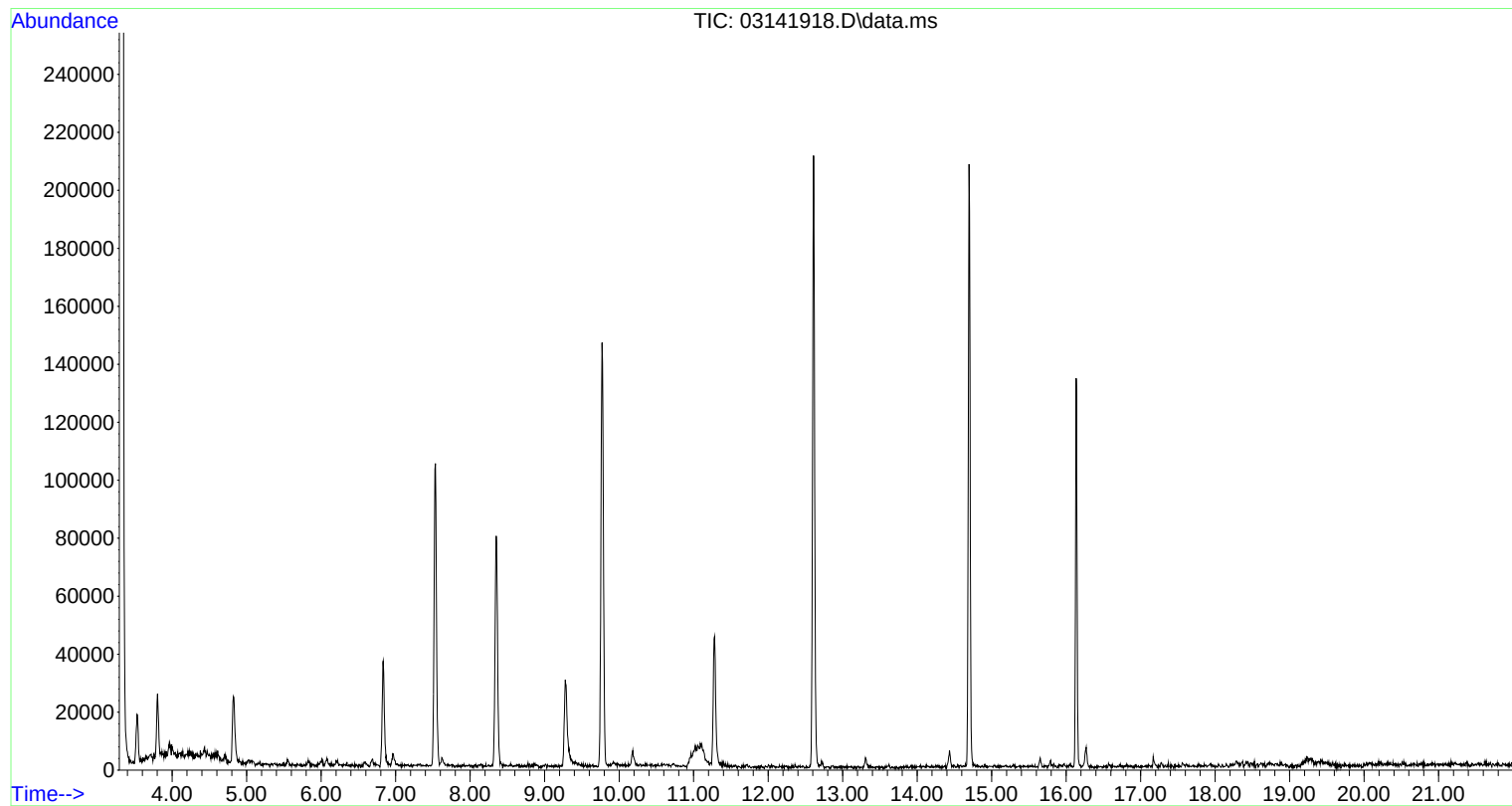
Quant Time: Mar 15 07:51:26 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
92) * 1,2-Dichlorobenzene	17.72	146	66	1.083	pg	# 18
93) * D-Limonene	17.74	68	142	3.163	pg	88
96) n-Undecane	18.42	85	144	12.813	pg	# 1
98) * Naphthalene	19.29	128	111	4.048	pg	# 67

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

Data Path : I:\MS21\DATA\2019 03\14\
Data File : 03141918.D
Acq On : 14 Mar 2019 19:18
Operator : RVT
Sample : AC02456
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Mar 15 07:51:26 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141922.D
 Acq On : 14 Mar 2019 22:05
 Operator : RVT
 Sample : AC02460
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 10 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:50 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	52493	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	175345	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	145369	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	76254	904.820	pg	0.00
Spiked Amount 1000.000			Recovery	=	90.48%	
57) Toluene-d8 (SS2)	12.61	98	175761	904.843	pg	0.00
Spiked Amount 1000.000			Recovery	=	90.48%	
74) Bromofluorobenzene (SS3)	16.14	174	46241	1241.288	pg	0.00
Spiked Amount 1000.000			Recovery	=	124.13%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	2454	27.326	pg	# 32
3) * Dichlorodifluoromethane	3.58	85	2461	12.666	pg	98
4) * Chloromethane	3.70	50	1113	10.971	pg	95
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	83	0.662	pg	# 42
7) * 1,3-Butadiene	3.99	54	198	2.743	pg	# 1
8) * Bromomethane	4.21	94	152	1.956	pg	# 38
10) * Ethanol	4.43	45	4761	116.521	pg	98
11) * Acetonitrile	4.60	41	3063	33.649	pg	100
12) * Acrolein	4.71	56	2312	44.620	pg	94
13) * Acetone	4.82	58	12679	179.908	pg	# 67
14) * Trichlorofluoromethane	4.96	101	1031	7.919	pg	98
15) * 2-Propanol (Isopropa...	5.02	45	2984	21.879	pg	95
16) * Acrylonitrile	5.17	53	474	5.330	pg	90
18) tert-Butanol	5.54	59	802	10.115	pg	# 61
19) * Methylene Chloride	5.56	84	7916	103.919	pg	99
21) * Trichlorotrifluoroet...	5.80	151	114	1.893	pg	# 38
22) * Carbon Disulfide	5.83	76	8631	40.782	pg	95
26) * Vinyl Acetate	6.69	86	269	23.489	pg	95
27) * 2-Butanone (MEK)	6.96	72	1312	30.762	pg	81
28) * cis-1,2-Dichloroethene	7.37	96	85	1.250	pg	# 19
29) DIPE	7.63	45	1303	6.469	pg	# 49
30) * Ethyl Acetate	7.63	61	1317	83.756	pg	88
31) * n-Hexane	7.62	57	558	5.652	pg	# 91
32) * Chloroform	7.67	83	264	2.234	pg	98
34) * Tetrahydrofuran	8.14	71	151	4.379	pg	# 64
39) * Benzene	9.34	78	2894	11.835	pg	99
41) 1-Butanol	9.28	56	20531	41.842	pg	90
42) * Carbon Tetrachloride	9.52	117	214	4.410	pg	100
43) * Cyclohexane	9.68	84	121	1.578	pg	# 78
47) * Trichloroethene	10.61	130	820	13.299	pg	100
48) * 1,4-Dioxane	10.64	88	238	5.307	pg	83
49) Isooctane	10.71	56	689	7.081	pg	# 35
51) * n-Heptane	11.02	71	276	3.545	pg	# 73
53) * 4-Methyl-2-pentanone	11.71	58	133	3.644	pg	# 42
58) * Toluene	12.72	91	9742	38.341	pg	100
59) * 2-Hexanone	13.06	58	218	8.189	pg	# 70
62) * n-Butyl Acetate	13.81	56	60	3.642	pg	# 38
63) * n-Octane	13.92	85	73	1.934	pg	# 50
64) * Tetrachloroethene	14.03	166	468	7.736	pg	97
65) * Chlorobenzene	14.75	112	182	1.322	pg	# 43
66) * Ethylbenzene	15.13	91	1861	9.060	pg	96
67) * m- & p-Xylenes	15.30	91	3515	22.732	pg	94
69) Cyclohexanone	15.45	98	88	5.086	pg	89
70) * Styrene	15.64	104	632	7.717	pg	99
71) * o-Xylene	15.73	91	1078	6.628	pg	99

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141922.D
 Acq On : 14 Mar 2019 22:05
 Operator : RVT
 Sample : AC02460
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 10 Sample Multiplier: 1

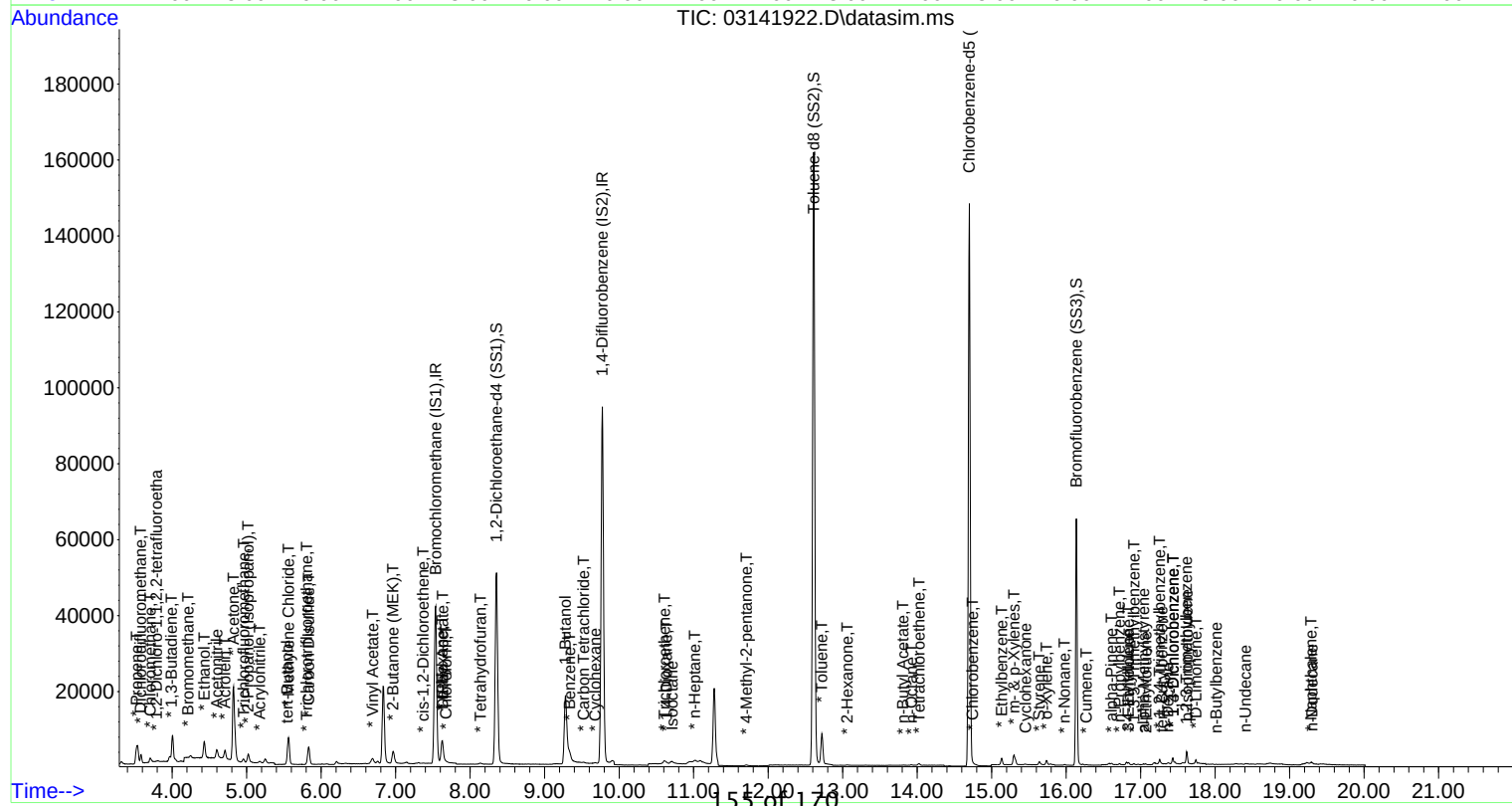
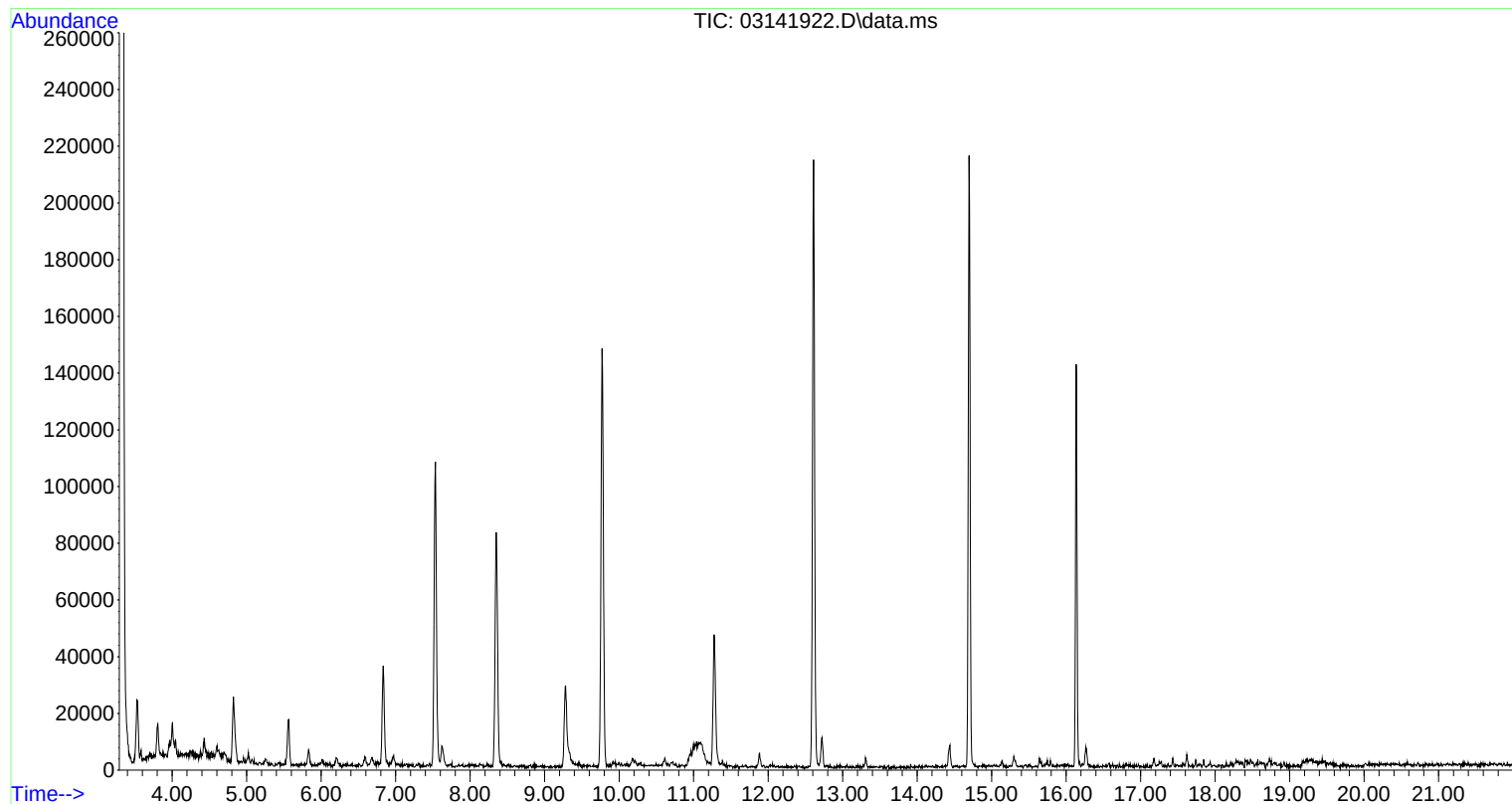
Quant Time: Mar 15 07:51:50 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
72) * n-Nonane	15.98	57	213	3.131	pg	97
75) * Cumene	16.27	105	101	0.545	pg #	50
76) * alpha-Pinene	16.61	93	225	2.441	pg	92
77) * n-Propylbenzene	16.72	91	294	1.526	pg #	17
78) 3-Ethyltoluene	16.84	105	322	2.153	pg	98
79) * 4-Ethyltoluene	16.84	105	290	2.151	pg #	89
80) * 1,3,5-Trimethylbenzene	16.91	105	230	1.707	pg	95
81) alpha-Methylstyrene	17.04	118	130	2.674	pg	88
82) 2-Ethyltoluene	17.07	105	216	1.347	pg	91
83) tert-Butylbenzene	17.28	134	67	2.226	pg #	49
84) * 1,2,4-Trimethylbenzene	17.26	105	816	6.326	pg	87
86) * 1,3-Dichlorobenzene	17.43	146	1247	20.917	pg	99
87) * 1,4-Dichlorobenzene	17.43	146	1247	24.355	pg	98
88) n-Decane	17.36	85	71	3.475	pg	80
90) 1,2,3-Trimethylbenzene	17.61	105	350	2.666	pg #	37
91) p-Isopropyltoluene	17.62	134	607	15.027	pg	84
93) * D-Limonene	17.74	68	445	9.416	pg #	78
94) n-Butylbenzene	18.01	134	50	2.184	pg #	1
96) n-Undecane	18.41	85	214	18.088	pg #	1
98) * Naphthalene	19.29	128	241	8.349	pg #	67
99) n-Dodecane	19.30	85	51	19.337	pg #	1

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

Data Path : I:\MS21\DATA\2019 03\14\
Data File : 03141922.D
Acq On : 14 Mar 2019 22:05
Operator : RVT
Sample : AC02460
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Mar 15 07:51:50 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141926.D
 Acq On : 15 Mar 2019 00:56
 Operator : RVT
 Sample : SC00904
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 14 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:52:14 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	51219	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	170168	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	139270	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	73871	898.347	pg	0.00
Spiked Amount 1000.000			Recovery	=	89.83%	
57) Toluene-d8 (SS2)	12.61	98	170531	916.365	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.64%	
74) Bromofluorobenzene (SS3)	16.14	174	44637	1250.704	pg	0.00
Spiked Amount 1000.000			Recovery	=	125.07%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	2889	32.970	pg	# 57
3) * Dichlorodifluoromethane	3.58	85	1169	6.166	pg	98
4) * Chloromethane	3.70	50	856	8.647	pg	99
7) * 1,3-Butadiene	4.00	54	180	2.556	pg	# 33
9) * Chloroethane	4.34	64	81	1.718	pg	# 44
10) * Ethanol	4.43	45	3477	87.213	pg	95
11) * Acetonitrile	4.60	41	1339	15.076	pg	86
12) * Acrolein	4.71	56	2750	54.393	pg	96
13) * Acetone	4.83	58	31696	460.936	pg	# 49
14) * Trichlorofluoromethane	4.96	101	463	3.644	pg	99
15) * 2-Propanol (Isopropa...	5.02	45	4791	36.002	pg	92
16) * Acrylonitrile	5.18	53	381	4.391	pg	91
18) tert-Butanol	5.54	59	757	9.785	pg	82
19) * Methylene Chloride	5.56	84	1902	25.590	pg	98
21) * Trichlorotrifluoroet...	5.81	151	85	1.446	pg	# 18
22) * Carbon Disulfide	5.83	76	11682	56.572	pg	99
26) * Vinyl Acetate	6.69	86	537	48.056	pg	# 19
27) * 2-Butanone (MEK)	6.96	72	3196	76.799	pg	90
29) DIPE	7.62	45	549	2.793	pg	# 49
30) * Ethyl Acetate	7.62	61	527	34.349	pg	90
31) * n-Hexane	7.62	57	282	2.928	pg	# 60
32) * Chloroform	7.67	83	101	0.876	pg	# 80
34) * Tetrahydrofuran	8.14	71	177	5.261	pg	# 55
39) * Benzene	9.34	78	1069	4.505	pg	98
41) 1-Butanol	9.28	56	20914	43.919	pg	91
42) * Carbon Tetrachloride	9.52	117	73	1.550	pg	# 3
47) * Trichloroethene	10.62	130	137	2.290	pg	81
48) * 1,4-Dioxane	10.64	88	926	21.275	pg	89
49) Isooctane	10.72	56	341	3.611	pg	# 16
51) * n-Heptane	11.02	71	288	3.812	pg	# 73
53) * 4-Methyl-2-pentanone	11.71	58	186	5.251	pg	91
58) * Toluene	12.72	91	2673	10.981	pg	100
59) * 2-Hexanone	13.06	58	542	21.251	pg	96
62) * n-Butyl Acetate	13.83	56	51	3.231	pg	# 38
63) * n-Octane	13.92	85	99	2.738	pg	# 72
66) * Ethylbenzene	15.13	91	344	1.748	pg	100
67) * m- & p-Xylenes	15.30	91	922	6.224	pg	100
69) Cyclohexanone	15.44	98	142	8.567	pg	# 62
70) * Styrene	15.64	104	106	1.351	pg	87
71) * o-Xylene	15.74	91	345	2.214	pg	93
72) * n-Nonane	15.98	57	273	4.188	pg	# 86
75) * Cumene	16.28	105	54	0.304	pg	# 50
76) * alpha-Pinene	16.61	93	59	0.668	pg	# 24
77) * n-Propylbenzene	16.72	91	177	0.959	pg	# 55
78) 3-Ethyltoluene	16.81	105	208	1.452	pg	98

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141926.D
 Acq On : 15 Mar 2019 00:56
 Operator : RVT
 Sample : SC00904
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 14 Sample Multiplier: 1

Quant Time: Mar 15 07:52:14 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)

79) * 4-Ethyltoluene	16.85	105	114	0.882	pg	# 46
80) * 1,3,5-Trimethylbenzene	16.91	105	97	0.751	pg	# 30
82) 2-Ethyltoluene	17.07	105	99	0.644	pg	# 45
83) tert-Butylbenzene	17.28	134	146	5.063	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	319	2.581	pg	86
86) * 1,3-Dichlorobenzene	17.43	146	82	1.436	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	82	1.672	pg	# 18
88) n-Decane	17.37	85	72	3.678	pg	77
90) 1,2,3-Trimethylbenzene	17.62	105	146	1.161	pg	# 73
91) p-Isopropyltoluene	17.62	134	154	3.980	pg	98
93) * D-Limonene	17.74	68	262	5.787	pg	85
96) n-Undecane	18.42	85	163	14.381	pg	# 1

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

Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141920.D
 Acq On : 14 Mar 2019 20:42
 Operator : RVT
 Sample : AC02458
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 8 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:38 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.54	130	52877	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	175905	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	145055	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	75485	889.191	pg	0.00
Spiked Amount 1000.000			Recovery =	88.92%		
57) Toluene-d8 (SS2)	12.61	98	176259	909.371	pg	0.00
Spiked Amount 1000.000			Recovery =	90.94%		
74) Bromofluorobenzene (SS3)	16.14	174	46150	1241.527	pg	0.00
Spiked Amount 1000.000			Recovery =	124.15%		

Target Compounds

						Qvalue
2) * Propene	3.53	42	1937	21.413	pg	# 19
3) * Dichlorodifluoromethane	3.58	85	1909	9.754	pg	# 99
4) * Chloromethane	3.70	50	934	9.139	pg	# 92
5) * 1,2-Dichloro-1,1,2,2...	3.80	85	90	0.712	pg	# 42
6) * Vinyl Chloride	3.88	62	61	0.627	pg	# 43
7) * 1,3-Butadiene	4.00	54	147	2.022	pg	# 1
8) * Bromomethane	4.21	94	139	1.776	pg	# 45
9) * Chloroethane	4.35	64	62	1.274	pg	# 41
10) * Ethanol	4.43	45	3442	83.628	pg	# 97
11) * Acetonitrile	4.60	41	1875	20.448	pg	# 86
12) * Acrolein	4.71	56	2312	44.296	pg	# 98
13) * Acetone	4.82	58	13511	190.322	pg	# 66
14) * Trichlorofluoromethane	4.96	101	754	5.749	pg	# 100
15) * 2-Propanol (Isopropa...	5.02	45	2876	20.934	pg	# 96
16) * Acrylonitrile	5.19	53	360	4.019	pg	# 93
18) tert-Butanol	5.54	59	648	8.113	pg	# 79
19) * Methylene Chloride	5.56	84	3335	43.463	pg	# 97
21) * Trichlorotrifluoroet...	5.81	151	148	2.440	pg	# 85
22) * Carbon Disulfide	5.83	76	1968	9.231	pg	# 82
26) * Vinyl Acetate	6.70	86	258	22.365	pg	# 32
27) * 2-Butanone (MEK)	6.97	72	760	17.690	pg	# 94
29) DIPE	7.63	45	1097	5.407	pg	# 49
30) * Ethyl Acetate	7.63	61	1135	71.657	pg	# 81
31) * n-Hexane	7.62	57	361	3.630	pg	# 99
32) * Chloroform	7.67	83	156	1.310	pg	# 17
34) * Tetrahydrofuran	8.13	71	118	3.397	pg	# 49
39) * Benzene	9.34	78	1274	5.193	pg	# 90
41) 1-Butanol	9.28	56	21556	43.791	pg	# 95
42) * Carbon Tetrachloride	9.52	117	120	2.465	pg	# 71
47) * Trichloroethene	10.62	130	167	2.700	pg	# 74
48) * 1,4-Dioxane	10.64	88	243	5.401	pg	# 96
49) Isooctane	10.72	56	455	4.661	pg	# 26
51) * n-Heptane	11.02	71	251	3.214	pg	# 78
53) * 4-Methyl-2-pentanone	11.71	58	106	2.895	pg	# 47
58) * Toluene	12.72	91	3709	14.629	pg	# 100
59) * 2-Hexanone	13.06	58	115	4.329	pg	# 64
63) * n-Octane	13.92	85	64	1.699	pg	# 50
64) * Tetrachloroethene	14.03	166	161	2.667	pg	# 84
65) * Chlorobenzene	14.75	112	51	0.371	pg	# 43
66) * Ethylbenzene	15.13	91	436	2.127	pg	# 94
67) * m- & p-Xylenes	15.30	91	1160	7.518	pg	# 97
70) * Styrene	15.64	104	84	1.028	pg	# 29
71) * o-Xylene	15.74	91	378	2.329	pg	# 85
72) * n-Nonane	15.98	57	155	2.283	pg	# 56
75) * Cumene	16.27	105	56	0.303	pg	# 50

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141920.D
 Acq On : 14 Mar 2019 20:42
 Operator : RVT
 Sample : AC02458
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 8 Sample Multiplier: 1

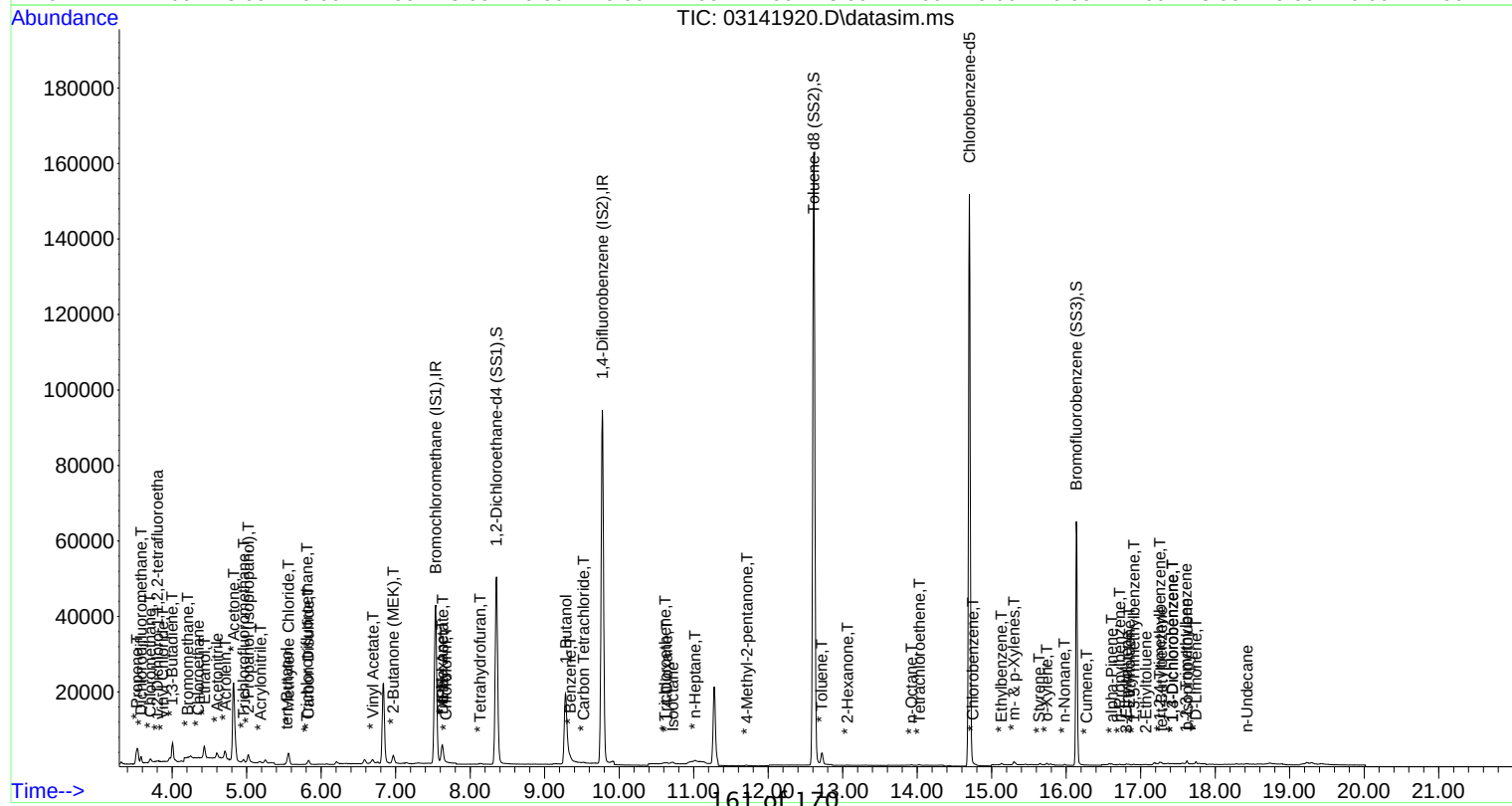
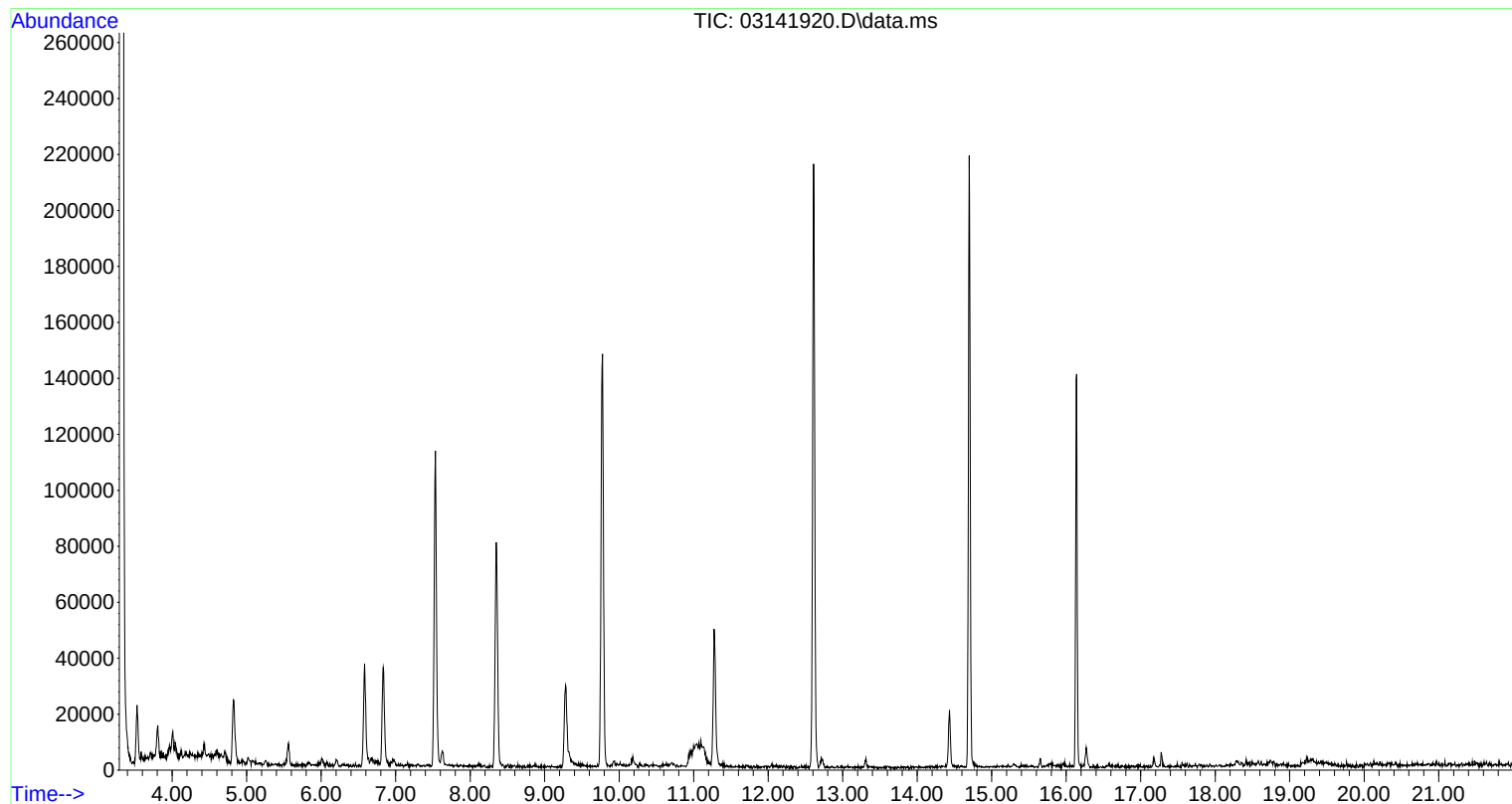
Quant Time: Mar 15 07:51:38 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
76) * alpha-Pinene	16.61	93	137	1.489	pg	98
77) * n-Propylbenzene	16.72	91	141	0.733	pg #	11
78) 3-Ethyltoluene	16.81	105	247	1.655	pg	90
79) * 4-Ethyltoluene	16.85	105	107	0.795	pg #	46
80) * 1,3,5-Trimethylbenzene	16.91	105	97	0.721	pg #	30
82) 2-Ethyltoluene	17.07	105	102	0.637	pg #	45
83) tert-Butylbenzene	17.28	134	141	4.694	pg #	1
84) * 1,2,4-Trimethylbenzene	17.26	105	358	2.781	pg #	84
86) * 1,3-Dichlorobenzene	17.43	146	73	1.227	pg #	18
87) * 1,4-Dichlorobenzene	17.43	146	73	1.429	pg #	18
90) 1,2,3-Trimethylbenzene	17.61	105	117	0.893	pg #	53
91) p-Isopropyltoluene	17.62	134	135	3.349	pg	77
93) * D-Limonene	17.74	68	284	6.023	pg	99
96) n-Undecane	18.42	85	123	10.419	pg #	1

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

Data Path : I:\MS21\DATA\2019 03\14\
Data File : 03141920.D
Acq On : 14 Mar 2019 20:42
Operator : RVT
Sample : AC02458
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Mar 15 07:51:38 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141923.D
 Acq On : 14 Mar 2019 22:47
 Operator : RVT
 Sample : AC02416
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 11 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:51:56 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	7.54	130	51564	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	172673	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	145045	1000.000	pg	0.00

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	75367	910.407	pg	0.00
Spiked Amount 1000.000			Recovery	=	91.04%	
57) Toluene-d8 (SS2)	12.61	98	172254	888.770	pg	0.00
Spiked Amount 1000.000			Recovery	=	88.88%	
74) Bromofluorobenzene (SS3)	16.14	174	45159	1214.951	pg	0.00
Spiked Amount 1000.000			Recovery	=	121.50%	

Target Compounds

						Qvalue
2) * Propene	3.53	42	1712	19.407	pg	# 27
3) * Dichlorodifluoromethane	3.58	85	609	3.191	pg	95
4) * Chloromethane	3.71	50	552	5.539	pg	96
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	62	0.503	pg	# 42
6) * Vinyl Chloride	3.89	62	74	0.780	pg	# 43
7) * 1,3-Butadiene	4.00	54	207	2.919	pg	# 1
10) * Ethanol	4.43	45	1547	38.543	pg	96
11) * Acetonitrile	4.60	41	540	6.039	pg	# 83
12) * Acrolein	4.71	56	2286	44.913	pg	94
13) * Acetone	4.83	58	11273	162.840	pg	# 48
14) * Trichlorofluoromethane	4.96	101	264	2.064	pg	96
15) * 2-Propanol (Isopropa...	5.02	45	1748	13.047	pg	89
16) * Acrylonitrile	5.18	53	379	4.339	pg	# 80
18) tert-Butanol	5.54	59	715	9.180	pg	98
19) * Methylene Chloride	5.57	84	811	10.838	pg	98
20) * 3-Chloro-1-propene (...)	5.63	41	57	0.792	pg	# 39
22) * Carbon Disulfide	5.83	76	2092	10.063	pg	99
26) * Vinyl Acetate	6.70	86	241	21.423	pg	# 31
27) * 2-Butanone (MEK)	6.97	72	1221	29.144	pg	99
29) DIPE	7.62	45	492	2.487	pg	# 49
30) * Ethyl Acetate	7.63	61	547	35.414	pg	# 81
31) * n-Hexane	7.63	57	218	2.248	pg	# 60
34) * Tetrahydrofuran	8.14	71	51	1.506	pg	# 52
39) * Benzene	9.34	78	786	3.264	pg	97
41) 1-Butanol	9.28	56	17993	37.237	pg	89
47) * Trichloroethene	10.62	130	526	8.663	pg	97
48) * 1,4-Dioxane	10.64	88	256	5.796	pg	# 74
49) Isooctane	10.73	56	306	3.193	pg	# 13
51) * n-Heptane	11.02	71	132	1.722	pg	# 27
53) * 4-Methyl-2-pentanone	11.71	58	88	2.448	pg	# 55
58) * Toluene	12.73	91	2458	9.695	pg	100
59) * 2-Hexanone	13.06	58	219	8.245	pg	# 72
66) * Ethylbenzene	15.14	91	337	1.644	pg	100
67) * m- & p-Xylenes	15.30	91	1057	6.851	pg	95
70) * Styrene	15.64	104	74	0.906	pg	# 29
71) * o-Xylene	15.74	91	339	2.089	pg	# 85
72) * n-Nonane	15.98	57	187	2.755	pg	93
76) * alpha-Pinene	16.61	93	55	0.598	pg	# 1
77) * n-Propylbenzene	16.71	91	106	0.551	pg	# 55
78) 3-Ethyltoluene	16.81	105	151	1.012	pg	# 44
79) * 4-Ethyltoluene	16.85	105	82	0.609	pg	# 1
82) 2-Ethyltoluene	17.07	105	83	0.519	pg	# 45
83) tert-Butylbenzene	17.28	134	1424	47.412	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.28	105	384	2.984	pg	# 49
86) * 1,3-Dichlorobenzene	17.43	146	117	1.967	pg	97

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141923.D
 Acq On : 14 Mar 2019 22:47
 Operator : RVT
 Sample : AC02416
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 11 Sample Multiplier: 1

Quant Time: Mar 15 07:51:56 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
87) * 1,4-Dichlorobenzene	17.43	146	117	2.290	pg	98
90) 1,2,3-Trimethylbenzene	17.61	105	116	0.886	pg #	58
91) p-Isopropyltoluene	17.62	134	119	2.953	pg	78
93) * D-Limonene	17.74	68	223	4.729	pg	97
96) n-Undecane	18.41	85	102	8.641	pg #	6
98) * Naphthalene	19.29	128	83	2.882	pg #	67

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

Data Path : I:\MS21\DATA\2019 03\14\

Data File : 03141923.D

Acq On : 14 Mar 2019 22:47

Operator : RVT

Sample : AC02416

Misc : 97600 (Sig #1); S31-02281901 (Sig #2)

ALS Vial : 11 Sample Multiplier: 1

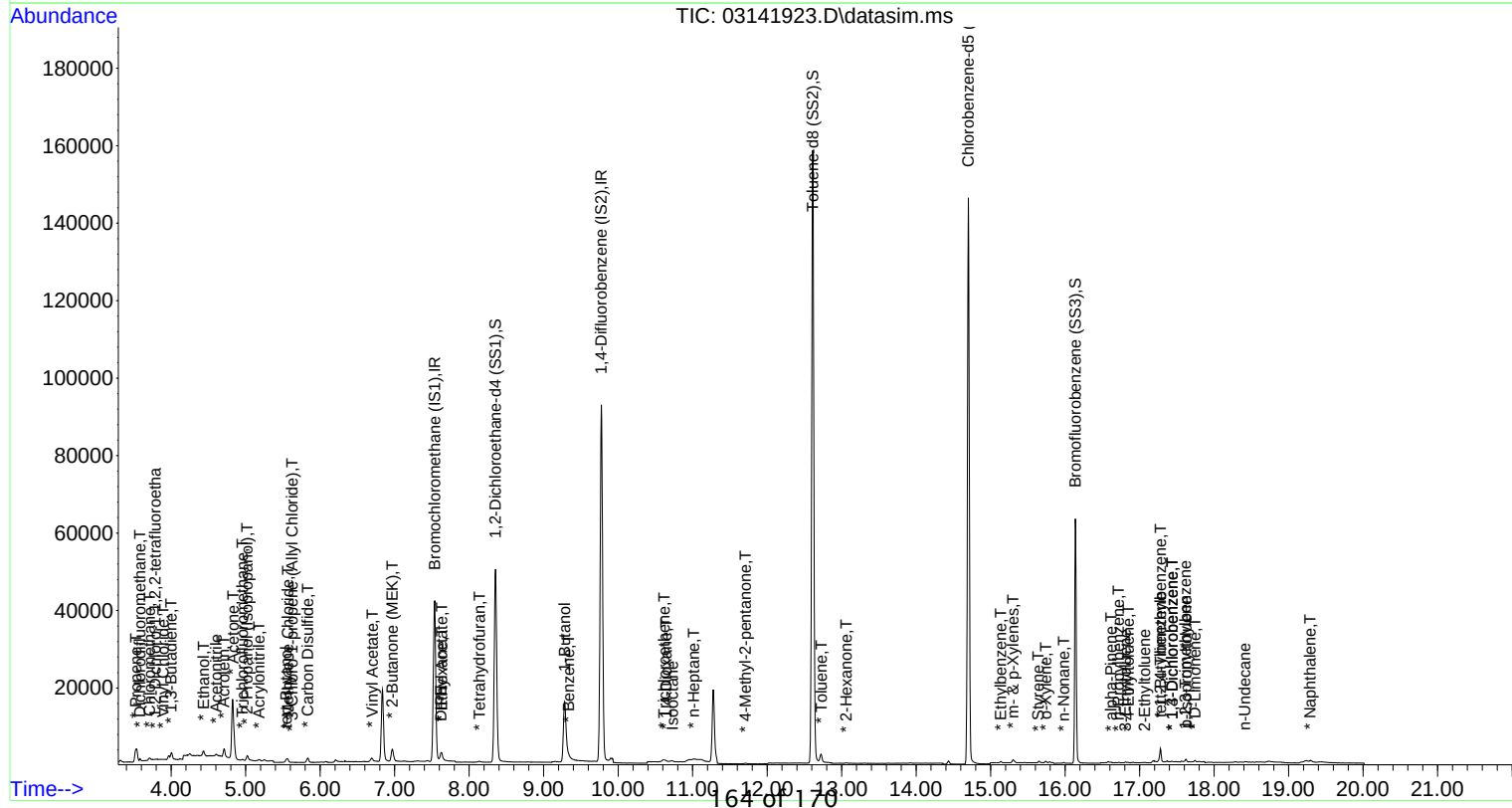
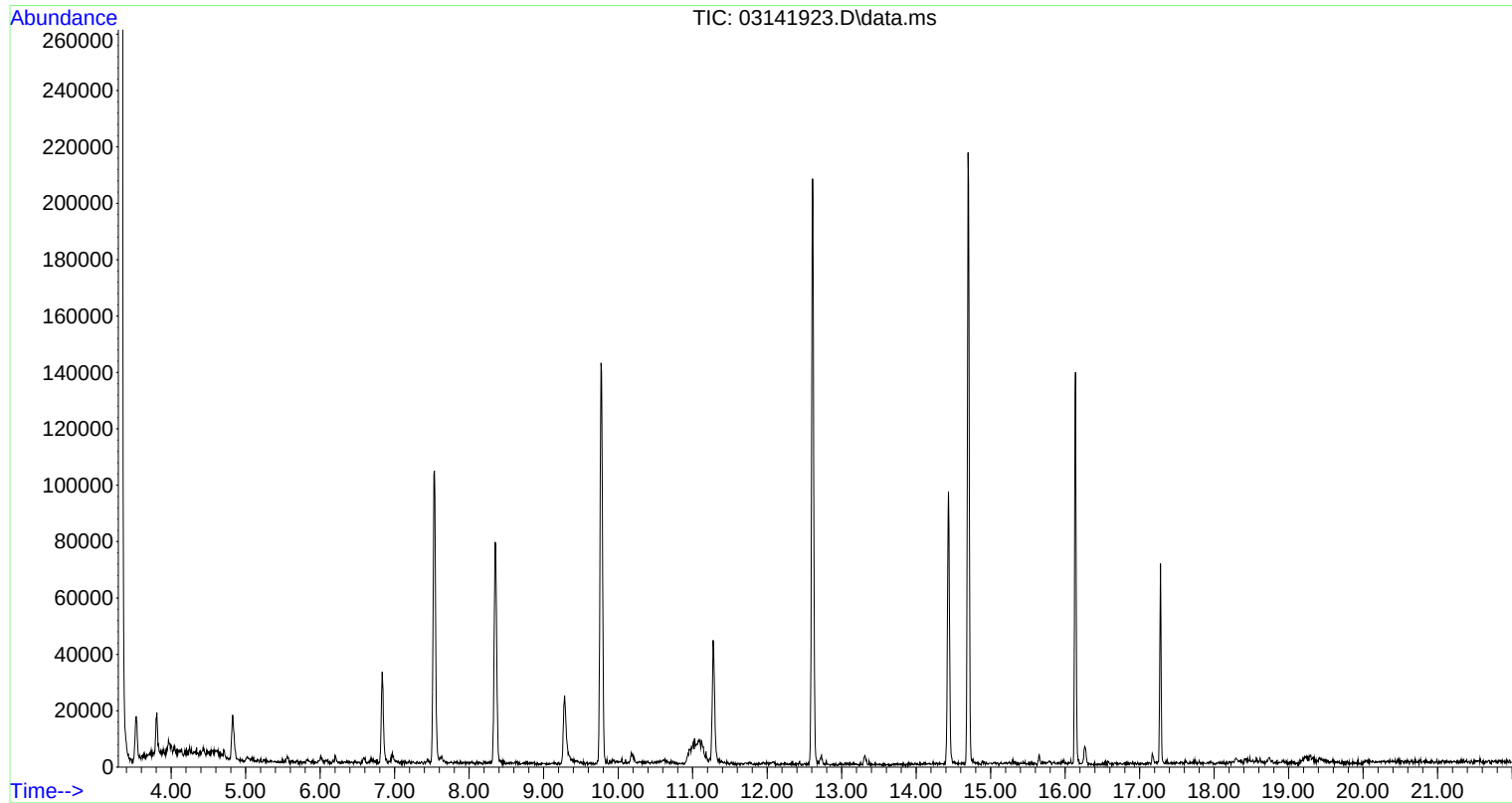
Quant Time: Mar 15 07:51:56 2019

Quant Method : I:\MS21\Methods\F21030819.M

Quant Title : EPA T0-15

QLast Update : Mon Mar 11 09:36:38 2019

Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141925.D
 Acq On : 15 Mar 2019 00:14
 Operator : RVT
 Sample : AC01305
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 13 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 07:52:08 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.53	130	52862	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	177569	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.70	117	148248	1000.000	pg	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4 ...	8.35	65	75275	886.969	pg	0.00
Spiked Amount 1000.000			Recovery	=	88.70%	
57) Toluene-d8 (SS2)	12.61	98	183461	926.142	pg	0.00
Spiked Amount 1000.000			Recovery	=	92.61%	
74) Bromofluorobenzene (SS3)	16.14	174	48770	1283.752	pg	0.00
Spiked Amount 1000.000			Recovery	=	128.38%	
Target Compounds						Qvalue
2) * Propene	3.52	42	3388	37.463	pg	# 70
3) * Dichlorodifluoromethane	3.58	85	863	4.411	pg	98
4) * Chloromethane	3.70	50	927	9.073	pg	93
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	58	0.459	pg	# 42
7) * 1,3-Butadiene	4.00	54	243	3.343	pg	# 1
8) * Bromomethane	4.21	94	113	1.444	pg	# 3
9) * Chloroethane	4.34	64	165	3.391	pg	# 41
10) * Ethanol	4.43	45	6204	150.777	pg	96
11) * Acetonitrile	4.60	41	744	8.116	pg	97
12) * Acrolein	4.70	56	5727	109.756	pg	93
13) * Acetone	4.83	58	106166	1495.924	pg	# 34
14) * Trichlorofluoromethane	4.96	101	336	2.563	pg	96
15) * 2-Propanol (Isopropa...	5.01	45	10062	73.261	pg	98
16) * Acrylonitrile	5.18	53	467	5.215	pg	87
18) tert-Butanol	5.54	59	3042	38.098	pg	87
19) * Methylene Chloride	5.56	84	803	10.468	pg	98
21) * Trichlorotrifluoroet...	5.81	151	72	1.187	pg	# 18
22) * Carbon Disulfide	5.83	76	1994	9.356	pg	# 91
26) * Vinyl Acetate	6.69	86	1084	93.992	pg	# 34
27) * 2-Butanone (MEK)	6.96	72	13835	322.119	pg	83
29) DIPE	7.62	45	575	2.835	pg	# 49
30) * Ethyl Acetate	7.63	61	622	39.281	pg	89
31) * n-Hexane	7.62	57	227	2.283	pg	# 60
32) * Chloroform	7.67	83	66	0.555	pg	# 17
34) * Tetrahydrofuran	8.13	71	244	7.027	pg	99
39) * Benzene	9.33	78	1048	4.232	pg	99
41) 1-Butanol	9.27	56	26063	52.451	pg	91
47) * Trichloroethene	10.61	130	455	7.287	pg	90
48) * 1,4-Dioxane	10.64	88	290	6.385	pg	100
49) Isooctane	10.72	56	507	5.145	pg	# 25
51) * n-Heptane	11.02	71	339	4.300	pg	# 86
53) * 4-Methyl-2-pentanone	11.70	58	650	17.585	pg	89
58) * Toluene	12.72	91	2445	9.436	pg	97
59) * 2-Hexanone	13.05	58	2845	104.791	pg	97
63) * n-Octane	13.91	85	105	2.728	pg	# 79
66) * Ethylbenzene	15.13	91	344	1.642	pg	93
67) * m- & p-Xylenes	15.29	91	1043	6.614	pg	94
69) Cyclohexanone	15.45	98	631	35.764	pg	90
70) * Styrene	15.64	104	79	0.946	pg	# 29
71) * o-Xylene	15.73	91	376	2.267	pg	96
72) * n-Nonane	15.98	57	206	2.969	pg	# 78
76) * alpha-Pinene	16.61	93	65	0.691	pg	# 51
77) * n-Propylbenzene	16.72	91	126	0.641	pg	# 53
78) 3-Ethyltoluene	16.81	105	197	1.292	pg	95
79) * 4-Ethyltoluene	16.84	105	83	0.604	pg	# 46

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141925.D
 Acq On : 15 Mar 2019 00:14
 Operator : RVT
 Sample : AC01305
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 13 Sample Multiplier: 1

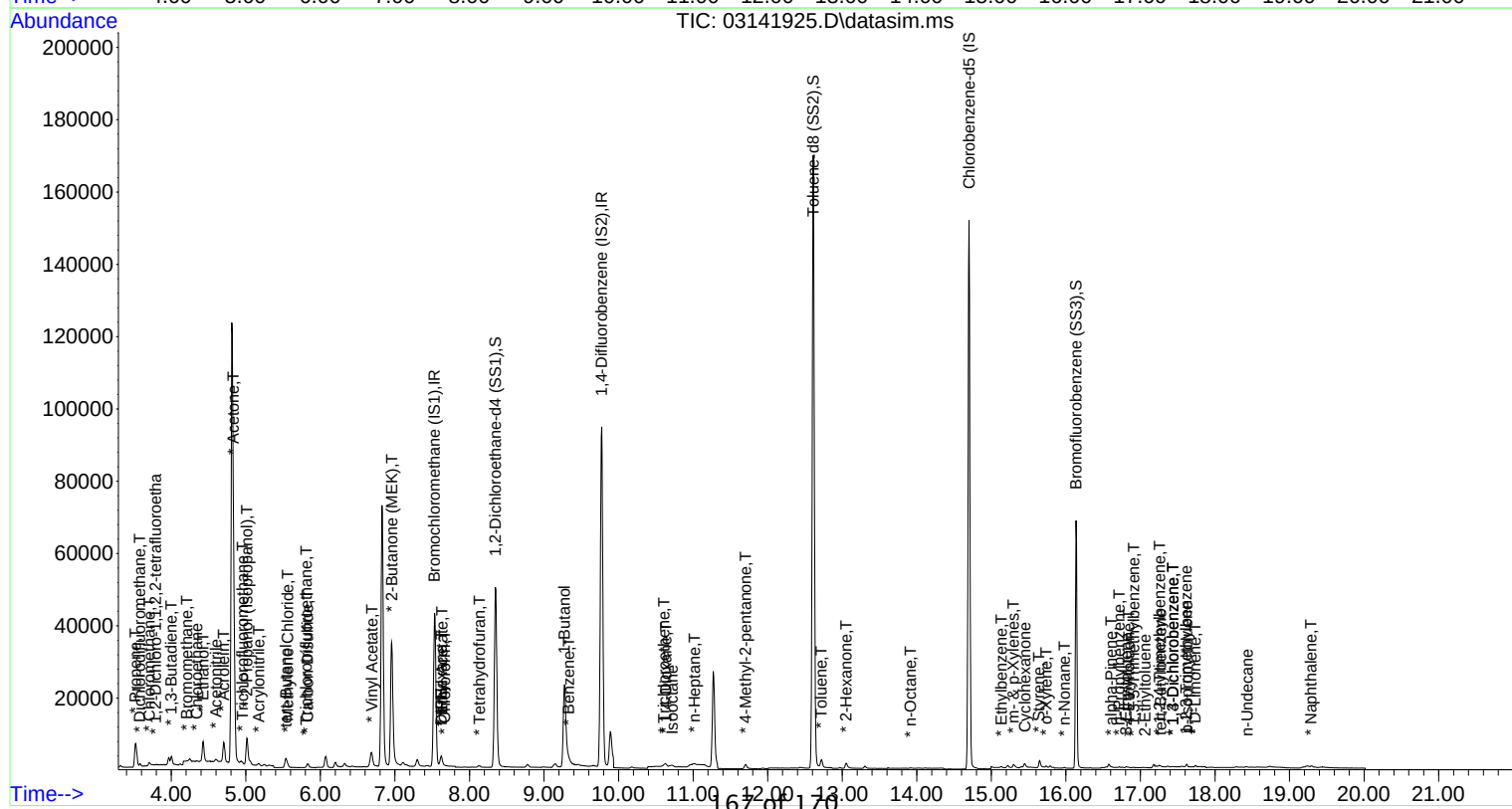
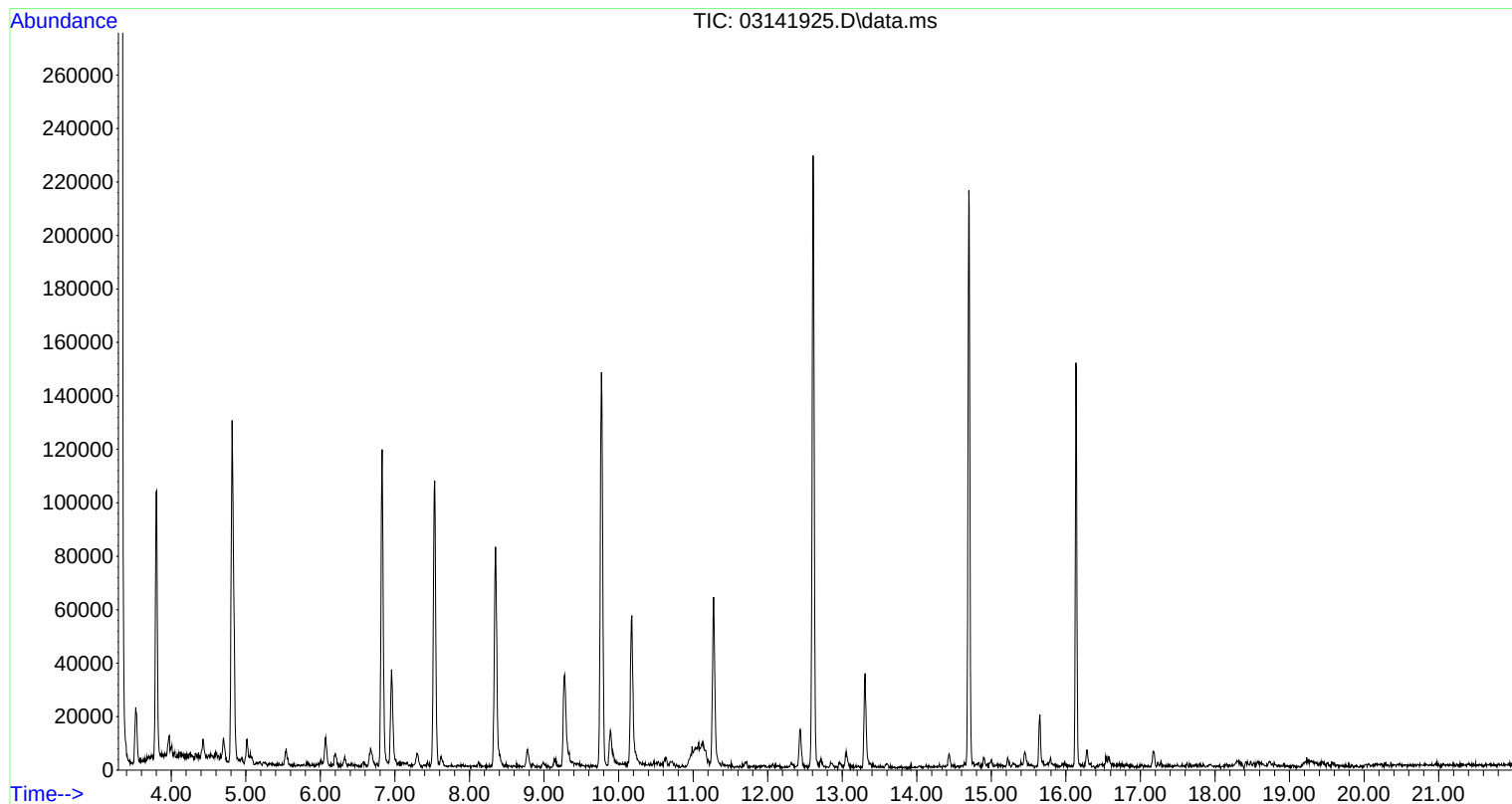
Quant Time: Mar 15 07:52:08 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
80) * 1,3,5-Trimethylbenzene	16.91	105	118	0.859	pg	# 30
82) 2-Ethyltoluene	17.06	105	94	0.575	pg	# 45
83) tert-Butylbenzene	17.27	134	89	2.899	pg	# 1
84) * 1,2,4-Trimethylbenzene	17.26	105	315	2.395	pg	97
86) * 1,3-Dichlorobenzene	17.43	146	75	1.234	pg	# 18
87) * 1,4-Dichlorobenzene	17.43	146	75	1.436	pg	# 18
90) 1,2,3-Trimethylbenzene	17.61	105	125	0.934	pg	91
91) p-Isopropyltoluene	17.62	134	108	2.622	pg	97
93) * D-Limonene	17.74	68	178	3.693	pg	97
96) n-Undecane	18.43	85	89	7.377	pg	# 1
98) * Naphthalene	19.29	128	65	2.208	pg	# 67

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

Data Path : I:\MS21\DATA\2019_03\14\
Data File : 03141925.D
Acq On : 15 Mar 2019 00:14
Operator : RVT
Sample : AC01305
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 13 Sample Multiplier: 1

Quant Time: Mar 15 07:52:08 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration



Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141936.D
 Acq On : 15 Mar 2019 7:54
 Operator : RVT
 Sample : AC02322
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 209 Sample Multiplier: 1

RVT 3/18/19

Quant Time: Mar 15 08:30:13 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev (Min)
1) Bromochloromethane (IS1)	7.53	130	49627	1000.000	pg	0.00
37) 1,4-Difluorobenzene (IS2)	9.77	114	167929	1000.000	pg	0.00
56) Chlorobenzene-d5 (IS3)	14.72	117	148429	1000.000	pg	0.02

System Monitoring Compounds

33) 1,2-Dichloroethane-d4 ...	8.35	65	69540	872.806	pg	0.00
Spiked Amount 1000.000			Recovery	=	87.28%	
57) Toluene-d8 (SS2)	12.65	98	168144	847.784	pg	0.04
Spiked Amount 1000.000			Recovery	=	84.78%	
74) Bromofluorobenzene (SS3)	16.15	174	52133	1370.601	pg	0.00
Spiked Amount 1000.000			Recovery	=	137.06%	

Target Compounds

						Qvalue
2) * Propene	3.52	42	11251	132.519	pg	# 67
3) * Dichlorodifluoromethane	3.58	85	11279	61.401	pg	98
4) * Chloromethane	3.70	50	8986	93.688	pg	94
5) * 1,2-Dichloro-1,1,2,2...	3.79	85	390	3.288	pg	97
6) * Vinyl Chloride	3.89	62	134	1.468	pg	# 1
7) * 1,3-Butadiene	3.99	54	468	6.858	pg	# 1
8) * Bromomethane	4.20	94	585	7.964	pg	83
9) * Chloroethane	4.34	64	662	14.493	pg	92
10) * Ethanol	4.42	45	68524	1773.909	pg	98
11) * Acetonitrile	4.59	41	10470	121.661	pg	99
12) * Acrolein	4.70	56	17632	359.938	pg	93
13) * Acetone	4.81	58	146852	2204.091	pg	76
14) * Trichlorofluoromethane	4.95	101	8424	68.436	pg	97
15) * 2-Propanol (Isopropa...	5.01	45	67428	522.941	pg	# 83
16) * Acrylonitrile	5.17	53	2036	24.217	pg	95
18) tert-Butanol	5.52	59	6595	87.979	pg	92
19) * Methylene Chloride	5.56	84	14414	200.150	pg	100
20) * 3-Chloro-1-propene (...)	5.67	41	518	7.475	pg	# 81
21) * Trichlorotrifluoroet...	5.81	151	1806	31.719	pg	93
22) * Carbon Disulfide	5.83	76	84712	423.389	pg	96
24) * 1,1-Dichloroethane	6.57	63	92	0.864	pg	# 1
26) * Vinyl Acetate	6.76	86	400	36.944	pg	55
27) * 2-Butanone (MEK)	6.95	72	20486	508.066	pg	81
28) * cis-1,2-Dichloroethene	7.37	96	299	4.650	pg	# 66
29) DIPE	7.61	45	3244	17.035	pg	# 49
30) * Ethyl Acetate	7.61	61	3396	228.445	pg	87
31) * n-Hexane	7.62	57	4969	53.241	pg	98
32) * Chloroform	7.67	83	2003	17.927	pg	95
34) * Tetrahydrofuran	8.12	71	1241	38.067	pg	97
36) * 1,2-Dichloroethane	8.47	62	779	9.526	pg	97
39) * Benzene	9.34	78	81412	347.641	pg	99
40) Isopropyl Acetate	9.33	61	547	32.662	pg	# 26
41) 1-Butanol	9.26	56	87380	185.944	pg	81
42) * Carbon Tetrachloride	9.52	117	2364	50.865	pg	99
43) * Cyclohexane	9.68	84	1361	18.534	pg	98
45) * 1,2-Dichloropropane	10.32	63	170	2.809	pg	94
46) * Bromodichloromethane	10.48	83	226	3.631	pg	# 18
47) * Trichloroethene	10.61	130	2838	48.062	pg	97
48) * 1,4-Dioxane	10.62	88	3022	70.358	pg	97
49) Isooctane	10.71	56	8012	85.973	pg	# 50
50) * Methyl Methacrylate	10.88	69	72	1.671	pg	# 39
51) * n-Heptane	11.02	71	3737	50.118	pg	97
52) * cis-1,3-Dichloropropene	11.64	75	125	3.136	pg	# 53
53) * 4-Methyl-2-pentanone	11.72	58	1037	29.666	pg	90
58) * Toluene	12.76	91	180616	696.182	pg	99

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Data Path : I:\MS21\DATA\2019 03\14\
 Data File : 03141936.D
 Acq On : 15 Mar 2019 7:54
 Operator : RVT
 Sample : AC02322
 Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
 ALS Vial : 209 Sample Multiplier: 1

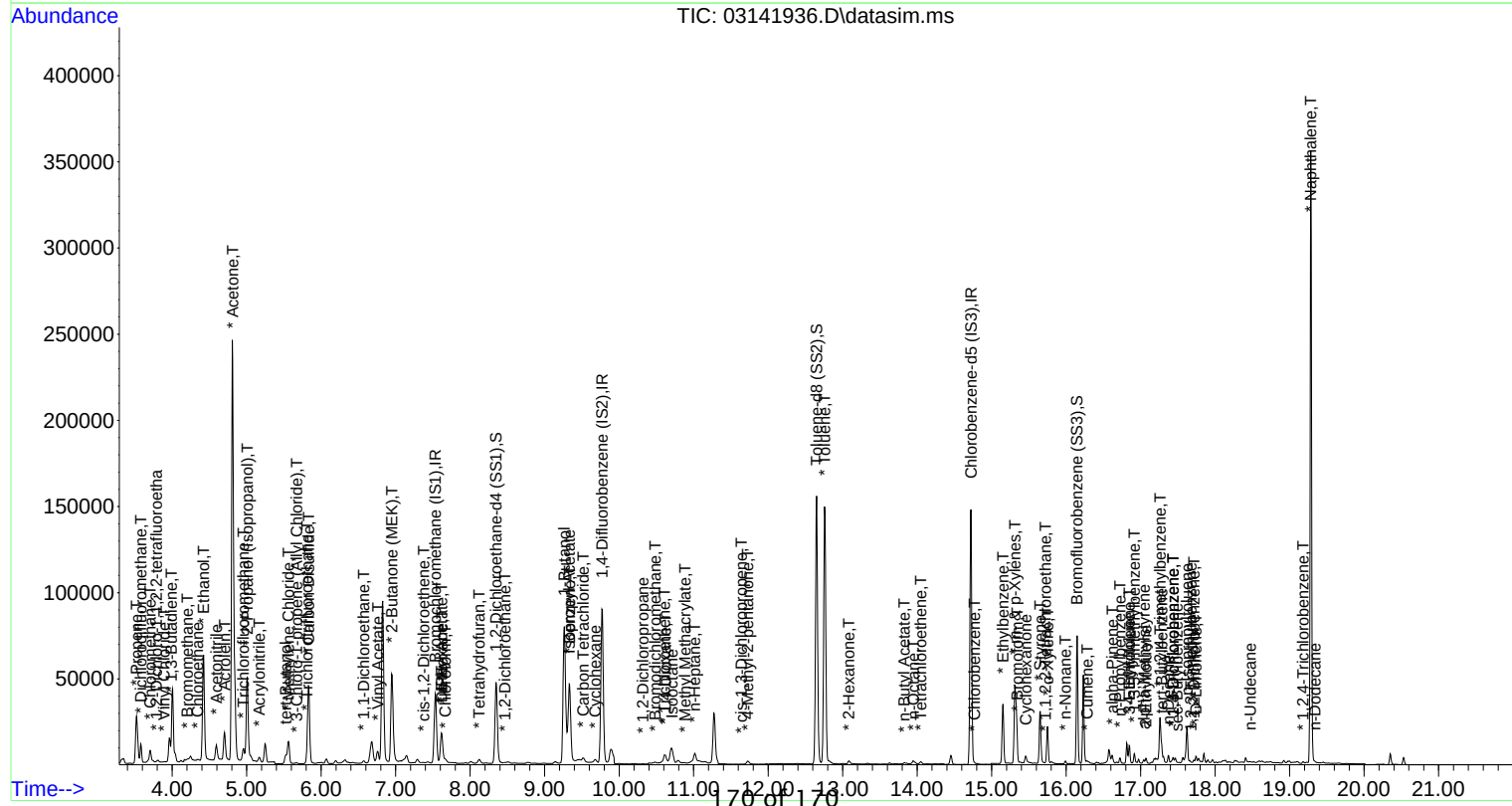
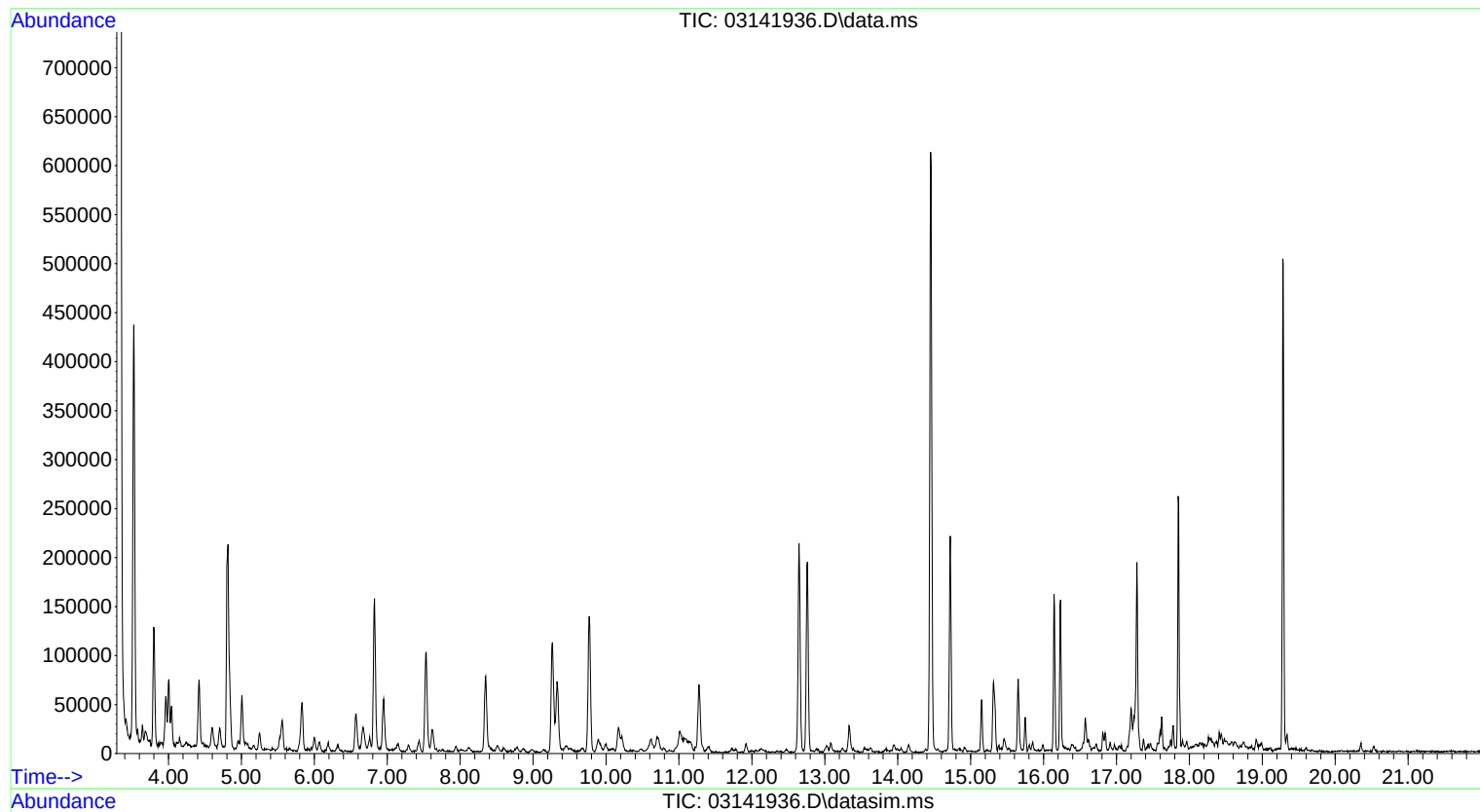
Quant Time: Mar 15 08:30:13 2019
 Quant Method : I:\MS21\Methods\F21030819.M
 Quant Title : EPA TO-15
 QLast Update : Mon Mar 11 09:36:38 2019
 Response via : Initial Calibration

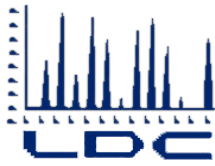
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
59) * 2-Hexanone	13.08	58	3425	126.001	pg	# 90
62) * n-Butyl Acetate	13.83	56	1076	63.970	pg	91
63) * n-Octane	13.95	85	1194	30.984	pg	99
64) * Tetrachloroethene	14.05	166	1312	21.241	pg	98
65) * Chlorobenzene	14.77	112	461	3.279	pg	97
66) * Ethylbenzene	15.15	91	38856	185.255	pg	98
67) * m- & p-Xylenes	15.31	91	66298	419.926	pg	98
68) * Bromoform	15.35	173	121	5.799	pg	# 26
69) Cyclohexanone	15.46	98	2280	129.068	pg	96
70) * Styrene	15.65	104	29718	355.405	pg	100
71) * o-Xylene	15.75	91	20112	121.110	pg	98
72) * n-Nonane	15.99	57	1522	21.910	pg	# 87
73) * 1,1,2,2-Tetrachloroe...	15.72	83	55	0.631	pg	# 18
75) * Cumene	16.28	105	1136	5.999	pg	100
76) * alpha-Pinene	16.62	93	2893	30.735	pg	97
77) * n-Propylbenzene	16.72	91	3102	15.765	pg	96
78) 3-Ethyltoluene	16.85	105	7483	49.006	pg	97
79) * 4-Ethyltoluene	16.85	105	7483	54.349	pg	100
80) * 1,3,5-Trimethylbenzene	16.92	105	3961	28.786	pg	100
81) alpha-Methylstyrene	17.05	118	1082	21.798	pg	97
82) 2-Ethyltoluene	17.07	105	2570	15.696	pg	98
83) tert-Butylbenzene	17.28	134	3871	125.947	pg	# 2
84) * 1,2,4-Trimethylbenzene	17.26	105	20595	156.371	pg	89
86) * 1,3-Dichlorobenzene	17.43	146	2282	37.489	pg	100
87) * 1,4-Dichlorobenzene	17.43	146	2282	43.650	pg	99
88) n-Decane	17.37	85	938	44.956	pg	99
89) sec-Butylbenzene	17.49	105	414	2.182	pg	# 38
90) 1,2,3-Trimethylbenzene	17.68	105	61	0.455	pg	# 27
91) p-Isopropyltoluene	17.62	134	3237	78.486	pg	95
92) * 1,2-Dichlorobenzene	17.71	146	64	0.977	pg	# 18
93) * D-Limonene	17.74	68	1773	36.744	pg	87
96) n-Undecane	18.47	85	407	33.692	pg	# 1
97) * 1,2,4-Trichlorobenzene	19.18	180	549	51.803	pg	97
98) * Naphthalene	19.28	128	401966	13638.780	pg	99
99) n-Dodecane	19.34	85	85	31.564	pg	# 1

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

Data Path : I:\MS21\DATA\2019 03\14\
Data File : 03141936.D
Acq On : 15 Mar 2019 7:54
Operator : RVT
Sample : AC02322
Misc : 97600 (Sig #1); S31-02281901 (Sig #2)
ALS Vial : 209 Sample Multiplier: 1

Quant Time: Mar 15 08:30:13 2019
Quant Method : I:\MS21\Methods\F21030819.M
Quant Title : EPA TO-15
QLast Update : Mon Mar 11 09:36:38 2019
Response via : Initial Calibration





LABORATORY DATA CONSULTANTS, INC.

2701 Loker Ave. West, Suite 220, Carlsbad, CA 92010 Bus: 760-827-1100 Fax: 760-827-1099

WSP Group
5 Sullivan Street
Cazenovia, NY 13035
ATTN: Mr. Erik S. Reinert
erik.reinert@wspgroup.com

April 22, 2019

SUBJECT: Former Huck Manufacturing Site, Kingston, NY, Data Validation

Dear Mr. Reinert,

Enclosed is the final validation report for the fraction listed below. This SDG was received on April 18, 2019. Attachment 1 is a summary of the samples that were reviewed for analysis.

LDC Project #44810:

<u>SDG</u>	<u>Fraction</u>
P1901824	Volatiles

The data validation was performed under Category B guidelines. The analyses were validated using the following documents, as applicable to each method:

- USEPA, Region 2 Analysis of Volatile Organic Compounds in Air Contained Canisters, SOP HW-31, Revision 6; September 2016
- USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review; EPA 540-R-2017-002; January 2017

Please feel free to contact us if you have any questions.

Sincerely,

Christina Rink
crink@lab-data.com
Project Manager/Senior Chemist

[illegible]

Site: Former Huck Manufacturing Site, Kingston, NY
Laboratory: ALS Environmental
Report No.: P1901824
Reviewer: Felomina Tanguilig and Christina Rink/Laboratory Data Consultants for
WSP Group - Pittsburgh, PA
Date: April 19, 2019

Samples Reviewed and Evaluation Summary

FIELD ID	LAB ID	FRACTIONS VALIDATED
HUCK IA F040219-1	P1901824-001	VOC
HUCK IA F040219-2	P1901824-002	VOC
HUCK IA FR040219-2	P1901824-003	VOC
HUCK IA F040219-3	P1901824-004	VOC
HUCK IA F040219-4	P1901824-005	VOC
HUCK IA F040219-5	P1901824-006	VOC
HUCK IA F040219-6	P1901824-007	VOC
HUCK AA F040219-1	P1901824-008	VOC
HUCK AA F040219-2	P1901824-009	VOC
TRIPBLANK 040219-1	P1901824-010	VOC

Associated QC Samples(s):

Field/Trip Blanks: TRIPBLANK 040219-1

Field Duplicate pair: HUCK IA F040219-2 and HUCK IA FR040219-2

The above-listed air samples were collected on April 2, 2019 and were analyzed for volatile organic compounds (VOCs) cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene by method TO-15 in Selected Ion Monitoring (SIM) mode. The data validation was performed in accordance with the USEPA Region 2 *Analysis of Volatile Organic Compounds in Air Contained Canisters*, SOP HW-31, Revision 6 (September 2016) and the USEPA *Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review*, EPA 540-R-2017-002 (January 2017), modified as necessary to accommodate the non-CLP methodologies used.

The organic data were evaluated based on the following parameters:

- Data Completeness
- Holding Times
- Gas Chromatography/Mass Spectrometry (GC/MS) Tunes
- Initial and Continuing Calibrations
- Blanks
- Surrogate Recoveries
- Matrix Spike/Matrix Spike Duplicate (MS/MSD) Results
- Laboratory Duplicate Results
- Laboratory Control Sample (LCS) Results
- Internal Standards
- Field Duplicate Results
- Quantitation Limits and Data Assessment
- Sample Quantitation and Compound Identification

Overall Evaluation of Data and Potential Usability Issues

All results are usable as reported or usable with minor qualification due to sample matrix or laboratory quality control outliers.

The validation findings were based on the following information.

Data Completeness

The data package was complete as defined under the requirements for the NYSDEC ASP category B laboratory deliverables.

Holding Times

All criteria were met.

GC/MS Tunes

All criteria were met.

Initial and Continuing Calibrations

All criteria were met.

Blanks

Contamination was not detected in the method blanks.

Contamination was detected in the associated VOC canister blank samples. The presence of blank contamination indicates that false positives may exist for these compounds in the associated samples. Action Levels (ALs) were established at <2x RL (for common contaminants) and <RL (for other contaminants) of the concentrations detected. The following table summarizes the contamination detected.

Blank ID	Compound	Level Detected	Action Level	Associated Samples
AC01830	Trichloroethene	0.014 ug/m ³	-	HUCK IA FR040219-2
AC02460	Trichloroethene	0.013 ug/m ³	-	HUCK IA F040219-4
AC02416	Trichloroethene	0.009 ug/m ³	0.045 ug/m ³	HUCK AA F040219-1
AC02322	Trichloroethene	0.048 ug/m ³	-	TRIPBLANK 040219-1

Sample results were qualified as follows:

- If sample concentration was < the reporting limit (RL) and ≤ the Action Level, qualify the result as a nondetect (U) at the RL.
- If sample concentration was > the RL and ≤ the Action Level, qualify the result as not detected (U) at the reported concentration.
- If the sample concentration was > the RL and > the Action Level, qualification of the data was not required.

Qualified sample results are listed in the table below.

Sample ID	Compound	Level Detected	Validation Action
HUCK AA F040219-1 (1.48x)	Trichloroethene	0.019 ug/m ³	0.16U ug/m ³

These results can be used for project objectives as nondetects (U) which may have a minor impact on the data usability.

No positive results were found in the trip blank sample TRIPBLANK 040219-1 for VOC analysis.

Surrogate Recoveries

All criteria were met.

MS/MSD Results

MS/MSD analyses were not required by the method. Validation action was not required on this basis.

LCS Results

All criteria were met.

Internal Standards

All criteria were met.

Field Duplicate Results

Samples HUCK IA F040219-2 and HUCK IA FR040219-2 were submitted as the field duplicate pair with this sample group. The following table summarizes the concentrations and validation actions taken.

Compound	Concentration (ug/m ³)		RPD
	HUCK IA F040219-2	HUCK IA FR040219-2	
cis-1,2-Dichloroethene	0.20	0.20	0
Trichloroethene	5.5	5.4	2
Tetrachloroethene	0.98	0.97	1

Quantitation Limits and Data Assessment

Results were reported which were below the reporting limit (RL) and above the method detection limit (MDL) in the VOC analysis. These results were qualified as estimated (J) by the laboratory.

Due to the high target analytes, samples were analyzed at dilutions. The following table lists the sample dilutions which were performed and the results reported. RLs were elevated accordingly.

Sample	VOC Analysis Reported
HUCK IA F040219-1 HUCK IA F040219-2 HUCK IA F040219-3	1.52-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK IA FR040219-2	1.57-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK IA F040219-4	1.43-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK IA F040219-5	1.54-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK IA F040219-6	1.42-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK AA F040219-1	1.48-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
HUCK AA F040219-2	1.53-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene
TRIPBLANK 040219-1	1-fold dilution due to sample matrix for cis-1,2-dichloroethene, trichloroethene, and tetrachloroethene

Sample Quantitation and Compound Identification

Calculations were spot-checked; no discrepancies were noted.

DATA VALIDATION QUALIFIERS

- U - The analyte was analyzed for, but due to blank contamination was flagged as nondetect (U). The result is usable as a nondetect.
- J - Data are flagged (J) when a QC analysis fails outside the primary acceptance limits. The qualified “J” data are not excluded from further review or consideration. However, only one flag (J) is applied to a sample result, even though several associated QC analyses may fail. The ‘J’ data may be biased high or low or the direction of the bias may be indeterminable.
- UJ - The analyte was not detected above the reported sample quantitation limit. Data are flagged (UJ) when a QC analysis fails outside the primary acceptance limits. The qualified “UJ” data are not excluded from further review or consideration. However, only one flag is applied to a sample result, even though several associated QC analyses may fail. The ‘UJ’ data may be biased low.
- JN - The analysis indicates the presence of a compound that has been “tentatively identified” (N) and the associated numerical value represents its approximate (J) concentration.
- R - Data rejected (R) on the basis of an unacceptable QC analysis should be excluded from further review or consideration. Data are rejected when associated QC analysis results exceed the expanded control limits of the QC criteria. The rejected data are known to contain significant errors based on documented information. The data user must not use the rejected data to make environmental decisions. The presence or absence of the analyte cannot be verified.

LDC #: 44810A48

VALIDATION COMPLETENESS WORKSHEET

SDG #: P1901824

Category B

Laboratory: ALS Environmental

Date: 4/19/19

Page: 1 of 1

Reviewer: [Signature]

2nd Reviewer: [Signature]

METHOD: GC/MS Volatiles (EPA Method TO-15-SIM)

600, S, AA

The samples listed below were reviewed for each of the following validation areas. Validation findings are noted in attached validation findings worksheets.

	Validation Area		Comments
I.	Sample receipt/Technical holding times	A 1A	
II.	GC/MS Instrument performance check	A	
III.	Initial calibration/ICV	A 1A	% PSD / ICV ≤ 30
IV.	Continuing calibration	A	CCV ≤ 30
V.	Laboratory Blanks / Per canister	A/SW	TB ≥ 10
VI.	Field blanks	ND	↓
VII.	Surrogate spikes	A	
VIII.	Matrix spike/Matrix spike duplicates	N	
IX.	Laboratory control samples	A	100
X.	Field duplicates	SW	D = 2, 3
XI.	Internal standards	A	
XII.	Compound quantitation RL/LOQ/LODs	A	Result $< RL > MDL = 1st$
XIII.	Target compound identification	A	
XIV.	System performance	A	
XV.	Overall assessment of data	A	

Note: A = Acceptable
N = Not provided/applicable
SW = See worksheet

ND = No compounds detected
R = Rinsate
FB = Field blank

D = Duplicate
TB = Trip blank
EB = Equipment blank

SB = Source blank
OTHER:

	Client ID	Lab ID	Matrix	Date
1	HUCK IA F040219-11.52X	P1901824-001	Air	04/02/19
2	HUCK IA F040219-2D1.52X	P1901824-002	Air	04/02/19
3	HUCK IA FR040219-2D1.57X	P1901824-003	Air	04/02/19
4	HUCK IA F040219-31.52X	P1901824-004	Air	04/02/19
5	HUCK IA F040219-41.43X	P1901824-005	Air	04/02/19
6	HUCK IA F040219-51.54X	P1901824-006	Air	04/02/19
7	HUCK IA F040219-61.42X	P1901824-007	Air	04/02/19
8	HUCK AA F040219-11.48X	P1901824-008	Air	04/02/19
9	HUCK AA F040219-21.53X	P1901824-009	Air	04/02/19
10	TRIPBLANK 040219-11X	P1901824-010	Air	04/02/19
11				
12	P190405-MB			
13				

LDC #:

44810A48

VALIDATION FINDINGS CHECKLIST

Page: 1 of 2

Reviewer: FT

2nd Reviewer:

Method: Volatiles (EPA Method TO-15)

Validation Area	Yes	No	NA	Findings/Comments
I. Technical holding times				
Were all technical holding times met?	✓			
Was canister pressure criteria met?	✓			
II. GC/MS Instrument performance check				
Were the BFB performance results reviewed and found to be within the specified criteria?	✓			
Were all samples analyzed within the 24 hour clock criteria?	✓			
IIIa. Initial calibration				
Did the laboratory perform a 5 point calibration prior to sample analysis?	✓			
Were all percent relative standard deviations (%RSD) < 30%?	✓			
IIIb. Initial calibration verification				
Was an initial calibration verification standard analyzed after every ICAL for each instrument?	✓			
Were all percent differences (%D) < 30% or percent recoveries (%R) 70-130%?	✓			
IV. Continuing calibration				
Was a continuing calibration standard analyzed at least once every 24 hours for each instrument?	✓			
Were all percent differences (%D) < 30% or percent recoveries (%R) 70-130%?	✓			
V. Laboratory Blanks/Canister Blanks				
Was a laboratory blank associated with every sample in this SDG?	✓			
Was a laboratory blank analyzed at least once every 24 hours for each matrix and concentration?	✓			
Was there contamination in the laboratory blanks? If yes, please see the Blanks validation completeness worksheet.		✓		
Was a canister blank analyzed for every canister?	✓			
Was there contamination in the canister blanks? If yes, please see the Canister Blanks validation completeness worksheet.	✓			
VI. Field Blanks				
Were field blanks identified in this SDG?	✓			
Were target compounds detected in the field blanks?		✓		
VII. Surrogate spikes (Optional)				
Were all surrogate percent recoveries (%R) within QC limits?	✓			
If the percent recovery (%R) for one or more surrogates was out of QC limits, was a reanalysis performed to confirm samples with %R outside of criteria?			✓	
VIII. Laboratory Duplicate				
Was a laboratory duplicate analyzed for this SDG?			✓	
Were the relative percent differences (RPD) within the QC limits?			✓	

LDC #:

44810A48

VALIDATION FINDINGS CHECKLIST

Page: 2 of 2

Reviewer: FT

2nd Reviewer:

Validation Area	Yes	No	NA	Findings/Comments
IX. Laboratory control samples				
Was an LCS analyzed for this SDG?	/			
Was an LCS analyzed per analytical batch?	/			
Were the LCS percent recoveries (%R) and relative percent difference (RPD) within the QC limits?	/			
X. Field duplicates				
Were field duplicate pairs identified in this SDG?	/			
Were target compounds detected in the field duplicates?	/			
XI. Internal standards				
Were internal standard area counts within $\pm 40\%$ from the associated calibration standard?	/			
Were retention times within ± 20.0 seconds from the associated calibration standard?	/			
XII. Compound quantitation				
Were the correct internal standard (IS), quantitation ion and relative response factor (RRF) used to quantitate the compound?	/			
Were compound quantitation and RLs adjusted to reflect all sample dilutions applicable to level IV validation?	/			
XIII. Target compound identification				
Were relative retention times (RRT's) within ± 0.06 RRT units of the standard?	/			
Did compound spectra meet specified EPA "Functional Guidelines" criteria?	/			
Were chromatogram peaks verified and accounted for?	/			
XIV. System performance				
System performance was found to be acceptable.	/			
XV. Overall assessment of data				
Overall assessment of data was found to be acceptable.	/			

LDC #: 44810A48**VALIDATION FINDINGS WORKSHEET**
Canister Check BlanksPage: 1 of 1Reviewer: FT2nd Reviewer: [Signature]**METHOD:** GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y N N/A Was there contamination in the canister blanks? If yes, please see the qualifications below.Blank analysis date: 3/14/19Conc. units: ug/m³Associated Samples: 3 (75X)

Compound	Blank ID	Sample Identification							
	AC01830								
S	0.014								

Blank analysis date: 3/14/19Conc. units: ug/m³Associated Samples: 5 75X

Compound	Blank ID	Sample Identification							
	AC02460								
S	0.013								

Blank analysis date: 3/14/19Conc. units: ug/m³Associated Samples: 8

Compound	Blank ID	SX	Sample Identification						
	AC02416			8 (1.48X)					
S	0.009	0.045		0.019 / 0.164					

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated canister blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC #: 44810A48**VALIDATION FINDINGS WORKSHEET**
Canister Check BlanksPage: 1 of 1Reviewer: FT2nd Reviewer: [Signature]**METHOD:** GC/MS VOA (EPA TO-15)

Please see qualifications below for all questions answered "N". Not applicable questions are identified as "N/A".

Y/N N/A Was there contamination in the canister blanks? If yes, please see the qualifications below.Blank analysis date: 3/15/19Conc. units: ug/m³Associated Samples: 10 (ND)

Compound	Blank ID	Sample Identification							
	AC02322								
S	0.048								

Blank analysis date: _____

Conc. units: _____

Associated Samples: _____

Compound	Blank ID	Sample Identification							

Blank analysis date: _____

Conc. units: _____

Associated Samples: _____

Compound	Blank ID	Sample Identification							

CIRCLED RESULTS WERE NOT QUALIFIED. ALL RESULTS NOT CIRCLED WERE QUALIFIED BY THE FOLLOWING STATEMENT:

Note: Common contaminants such as Methylene chloride, Acetone, 2-Butanone, Carbon disulfide and TICs that were detected in samples within ten times the associated canister blank concentration were qualified as not detected, "U". Other contaminants within five times the method blank concentration were also qualified as not detected, "U".

LDC#: 44810A48

VALIDATION FINDINGS WORKSHEET
Field Duplicates

Page: 1 of 2
Reviewer: FA
2nd Reviewer: FA

METHOD: GC/MS TO15 SIM

Compound	Concentration ug/m3)		RPD
	2	3	
QQQ	0.20	0.20	0
S	5.5	5.4	2
AA	0.98	0.97	1

LDC #: 44810A48

VALIDATION FINDINGS WORKSHEET

Initial Calibration Calculation Verification

Page: 1 of 1

Reviewer: FT

2nd Reviewer: _____

METHOD: GCMS TO15

The calibration factors (RRFF), average RRFF, and relative standard deviation (%RSD) were recalculated for compounds identified below using the following calculations:

$$RRF = (A_x)(C_{is}) / (A_{is})(C_x)$$

average RRF = sum of the RRFs/number of standards

$$\%RSD = 100 * (S/X)$$

Where:

A_x = Area of compound

Cx = Concentration of compound

S = Standard deviation of the RRFs

X = Mean of the RRFs

Ais = Area of associated internal standard

Cis = Concentration of internal Standard

[illegible]

LDC #: 448/0A48

VALIDATION FINDINGS WORKSHEET **Continuing Calibration Results Verification**

Page: 1 of 1
 Reviewer: F2
 2nd Reviewer: [Signature]

METHOD: GC/MS VOA (EPA TO-15)

The percent difference (%D) of the initial calibration average Relative Response Factors (RRFs) and the continuing calibration RRFs were recalculated for the compounds identified below using the following calculation:

$$\% \text{ Difference} = 100 * (\text{ave. RRF} - \text{RRF}) / \text{ave. RRF}$$

$$\text{RRF} = (A_x)(C_{is}) / (A_{is})(C_x)$$

Where: ave. RRF = initial calibration average RRF

RRF = continuing calibration RRF

A_x = Area of compound,C_x = Concentration of compound,A_{is} = Area of associated internal standardC_{is} = Concentration of internal standard

#	Standard ID	Calibration Date	Compound (Reference internal Standard)	Average RRF (initial)	Reported	Recalculated	Reported	Recalculated
					RRF (CC)	RRF (CC)	%D	%D
1	CCV	4/5/19	AAA	1.288	1.176	1.176	8.7	8.7
	0453		AA	0.340	0.311	0.311	8.5	8.5
2								
3								

Comments: Refer to Continuing Calibration findings worksheet for list of qualifications and associated samples when reported results do not agree within 10.0% of the recalculated results.

LDC #:

VALIDATION FINDINGS WORKSHEET

METHOD: GC/MS VOA (EPA Method TO-15)

~~Y~~ ~~N~~ N/A

Were all reported results recalculated and verified for all level IV samples?

☒	☐	☐	☐
Y	N	N/A	

Were all recalculated results for detected target compounds agree within 10.0% of the reported results?

$$\text{Concentration} = \frac{(A_s)(I_s)(DF)}{(A_{is})(RRF)(V_o)(\%S)}$$

A_x = Area of the characteristic ion (EICP) for the compound to be measured

A_{is} = Area of the characteristic ion (EICP) for the specific internal standard

I_s = Amount of internal standard added in nanograms (ng)

RRF = Relative response factor of the calibration standard.

V_o = Volume or weight of sample pruged in milliliters (ml) or grams (g).

Df = Dilution factor.

%S = Percent solids, applicable to soils and solid matrices only.

Example:

Sample I.D. # 1, ΔΔ:

$$\text{Conc.} = \frac{(24100) (1000.0) (1.92)}{(97630) (0.340) (1000)}$$

$$= 1.104 \text{ ug/m}^3$$

[illegible]

Former Huck Manufacturing Site, Kingston, NY - LDC# 44810

SDG: P1901824

Analytical Method		TO15 SIM										
Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Validated	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
HUCK AA F040219-1	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019		Y	N	U		U	0.014	0.014	ug/m3
HUCK AA F040219-1	P1901824-00	Tetrachloroethene	4/5/2019	0.078	Y	Y	J		J	0.012	0.012	ug/m3
HUCK AA F040219-1	P1901824-00	Trichloroethylene (TCE)	4/5/2019	0.16	Y	Y	J	U	U	0.013	0.013	ug/m3
HUCK AA F040219-2	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019		Y	N	U		U	0.014	0.014	ug/m3
HUCK AA F040219-2	P1901824-00	Tetrachloroethene	4/5/2019	0.070	Y	Y	J		J	0.013	0.013	ug/m3
HUCK AA F040219-2	P1901824-00	Trichloroethylene (TCE)	4/5/2019	0.020	Y	Y	J		J	0.013	0.013	ug/m3
HUCK IA F040219-1	P1901824-00	Tetrachloroethene	4/5/2019	1.1	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-1	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.23	Y	Y				0.014	0.014	ug/m3
HUCK IA F040219-1	P1901824-00	Trichloroethylene (TCE)	4/5/2019	6.2	Y	Y				0.013	0.013	ug/m3
HUCK IA F040219-2	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.20	Y	Y				0.014	0.014	ug/m3
HUCK IA F040219-2	P1901824-00	Tetrachloroethene	4/5/2019	0.98	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-2	P1901824-00	Trichloroethylene (TCE)	4/5/2019	5.5	Y	Y				0.013	0.013	ug/m3
HUCK IA F040219-3	P1901824-00	Trichloroethylene (TCE)	4/5/2019	6.8	Y	Y				0.013	0.013	ug/m3
HUCK IA F040219-3	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.35	Y	Y				0.014	0.014	ug/m3
HUCK IA F040219-3	P1901824-00	Tetrachloroethene	4/5/2019	1.4	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-4	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.016	Y	Y	J		J	0.013	0.013	ug/m3
HUCK IA F040219-4	P1901824-00	Trichloroethylene (TCE)	4/5/2019	0.29	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-4	P1901824-00	Tetrachloroethene	4/5/2019	0.30	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-5	P1901824-00	Trichloroethylene (TCE)	4/5/2019	4.6	Y	Y				0.013	0.013	ug/m3
HUCK IA F040219-5	P1901824-00	Tetrachloroethene	4/5/2019	0.73	Y	Y				0.013	0.013	ug/m3
HUCK IA F040219-5	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.25	Y	Y				0.014	0.014	ug/m3
HUCK IA F040219-6	P1901824-00	Tetrachloroethene	4/5/2019	0.23	Y	Y				0.012	0.012	ug/m3
HUCK IA F040219-6	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.029	Y	Y	J		J	0.013	0.013	ug/m3

SDG: P1901824

Analytical Method TO15 SIM

Sample ID	Lab Sample ID	Chemical Name	Anal Date	Result	Validated	Detect	Lab Qual	Val Qual	Final qual	RL	MDL	Units
HUCK IA F040219-6	P1901824-00	Trichloroethylene (TCE)	4/5/2019	1.6	Y	Y				0.012	0.012	ug/m3
HUCK IA FR040219-2	P1901824-00	Tetrachloroethene	4/5/2019	0.97	Y	Y				0.013	0.013	ug/m3
HUCK IA FR040219-2	P1901824-00	Cis-1,2-Dichloroethylene	4/5/2019	0.20	Y	Y				0.014	0.014	ug/m3
HUCK IA FR040219-2	P1901824-00	Trichloroethylene (TCE)	4/5/2019	5.4	Y	Y				0.013	0.013	ug/m3
TRIPBLANK 040219-1	P1901824-01	Cis-1,2-Dichloroethylene	4/5/2019		Y	N	U		U	0.0092	0.0092	ug/m3
TRIPBLANK 040219-1	P1901824-01	Trichloroethylene (TCE)	4/5/2019		Y	N	U		U	0.0085	0.0085	ug/m3
TRIPBLANK 040219-1	P1901824-01	Tetrachloroethene	4/5/2019		Y	N	U		U	0.0082	0.0082	ug/m3

LDC #: 44810

EDD POPULATION COMPLETENESS WORKSHEET

Date: 4/22/19
Page: 1 of 1
2nd Reviewer: JEThe LDC job number listed above was entered by CB
Entered from Body or Summary

	EDD Process		Comments/Action
I.	EDD Completeness	-	
Ia.	- All methods present?	y	
Ib.	- All samples present/match report?	y	
Ic.	- All reported analytes present?	y	
Id.	<u>10%</u> or 100% verification of EDD?	y	
II.	EDD Preparation/Entry	-	
Ila.	- Carryover U/J?	y	
Ilb.	- Reason Codes used? If so, note which codes.	N	
Iic.	- Additional Information (QC Level, Validator, <u>Validated Y/N</u> , etc.)	y	
III.	Reasonableness Checks	-	
IIIa.	- Do all qualified ND results have ND qualifier (e.g. UJ)?	y	
IIIb.	- Do all qualified detect results have detect qualifier (e.g. J)?	y	
IIIc.	- If reason codes are used, do all qualified results have reason code field populated, and vice versa?	-	
IIId.	- Does the detect flag require changing for blank qualifier? If so, are all U results marked ND?	N/NA	
IIIe.	- Do blank concentrations in report match EDD where data was qualified due to blank contamination?	y	
IIIf.	- Were multiple results reported due to dilutions/reanalysis? If so, were results qualified appropriately?	N/NA	
IIIg.	- Are there any discrepancies between the data packet and the EDD?	N	

Notes: *see discrepancy sheet