

Material in portions of this document have been removed because they contain personal privacy information which is exempt from public release under FOIA 5 U.S.C. § 552. Where removed, a note states that the removed material is maintained in a confidential portion of the Administrative Record that is not available to the public.

FINAL

**ADDENDUM 01 TO THE
FINAL SITE INSPECTION REPORT**

**SITE INSPECTION OF AQUEOUS FILM FORMING FOAM (AFFF) RELEASE AREAS
ENVIRONMENTAL PROGRAMS WORLDWIDE**

DAVIS-MONTHAN AIR FORCE BASE, ARIZONA

Project No. 775303101

Prepared for:

**Air Force Civil Engineer Center
Joint Base San Antonio – Lackland, Texas**



Prepared by:



Amec Foster Wheeler Programs, Inc.

Contract FA8903-16-D-0027

Task Order 0004

July 2019

This page intentionally left blank.

TABLE OF CONTENTS

ACRONYMS	v
EXECUTIVE SUMMARY	vii
1.0 INTRODUCTION	1
1.1 PROJECT OBJECTIVES	2
1.2 PROJECT SCOPE	3
2.0 BACKGROUND	5
2.1 SITE LOCATION AND SETTING	5
2.2 SITE HISTORY	5
2.3 PREVIOUS SITE INSPECTION ACTIVITIES.....	5
2.3.1 <i>Rationale for Expanded SI</i>	6
3.0 EXPANDED SI FIELD ACTIVITIES AND ANALYTICAL PROTOCOL	9
3.1 AFFF RELEASE AREA 3	15
3.1.1 <i>Sample Location and Methodologies</i>	15
3.1.2 <i>Analytical Results</i>	15
3.1.3 <i>Conclusions</i>	16
3.2 4-MILE WELL SURVEY	17
4.0 MIGRATION/EXPOSURE PATHWAYS AND TARGETS	19
4.1 GROUNDWATER MIGRATION PATHWAY.....	19
4.2 GROUNDWATER EXPOSURE CONCLUSIONS	20
5.0 SUMMARY AND CONCLUSIONS	21
6.0 REFERENCES	23

FIGURES

Information about private water sources has been masked as it is not publicly releasable and is maintained in a separate portion of the Air Force Administrative Record that is not accessible to the public.

- Figure 1.0-1 Installation Location
- Figure 3.0-1 Sample Locations and Groundwater Elevations
- Figure 3.1-1 PFAS in Groundwater
- Figure 3.2-1 4-Mile Well Survey

TABLES

Information about private water sources has been masked as it is not publicly releasable and is maintained in a separate portion of the Air Force Administrative Record that is not accessible to the public.

- Table 1.0-1 Regulatory Screening Values (Page 2 in Report)
- Table 3.0-1 Monitoring Well Construction Details (Tables Section)
- Table 3.0-2 Groundwater Elevations (Tables Section)
- Table 3.1-1 Summary of Groundwater Analytical Testing Results (Tables Section)
- Table 3.2-1 4-Mile Well Reconnaissance Survey (Tables Section)
- Table 4.0-1 Conceptual Site Model: Installation-Wide Summary (Tables Section)
- Table 5.0-1 Summary of Analytical Results and Screening Level Exceedances (Page 22 in Report)

APPENDICES

- Appendix A Photograph Log
 - A-1 Well Reconnaissance Survey
- Appendix B Field Forms
 - B-1 Field Activity Daily Logs
 - B-2 Daily PFAS Protocol Checklists
 - B-3 Tailgate Safety Meeting Reports
 - B-4 Soil Boring/Monitoring Well Records
 - B-5 Well Development Forms
 - B-6 Water Quality Sampling Instrument Calibration Forms
 - B-7 Groundwater Sampling Records
- Appendix C Laboratory Analytical Reports (DVD)
- Appendix D Data Validation Reports
- Appendix E Survey Results

ACRONYMS

Accutest	SGS Accutest Laboratories, Inc.
ADEQ	Arizona Department of Environmental Quality
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFFF	Aqueous Film Forming Foam
Amec Foster Wheeler	Amec Foster Wheeler Programs, Inc. and its affiliate Wood Environment and Infrastructure Solutions, Inc.
ADWR	Arizona Department of Water Resources
bgs	Below Ground Surface
CSM	Conceptual Site Model
DL	Detection Limit
DMAFB	Davis-Monthan Air Force Base
DO	Dissolved Oxygen
DoD	Department of Defense
DRO	Diesel Range Organics
ft	foot or feet
FTS	Fluorotelomer Sulfonate
GRO	Gasoline Range Organics
HA	Health Advisory
HDPE	High-Density Polyethylene
HGL	HydroGeoLogic, Inc.
IDW	Investigation-Derived Waste
ISWP	Installation-Specific Work Plan
LC-MS/MS	Liquid Chromatography and Tandem Mass Spectrometry
LOQ	Limit of Quantitation
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
NEtFOSAA	N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)
NMeFOSAA	N-Methyl Perfluorooctanesulfonamidoacetic Acid
ORP	Oxygen Reduction Potential
PA	Preliminary Assessment
PCB	polychlorinated biphenyls

PFAS	Per- and Polyfluorinated Alkyl Substances
PFBS	Perfluorobutanesulfonic Acid
PFDA	Perfluorodecanoic Acid
PFDoA	Perfluorododecanoic Acid
PFHpA	Perfluoroheptanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHxS	Perfluorohexanesulfonic Acid
PFNA	Perfluorononanoic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctanesulfonic Acid
PFTA	Perfluorotetradecanoic Acid
PFTTrDA	Perfluorotridecanoic Acid
PFUnA	Perfluoroundecanoic Acid
PID	Photoionization Detector
PPE	Personal Protective Equipment
PVC	Polyvinyl Chloride
QPP	Quality Program Plan
RPM	Remedial Project Manager
RSL	Regional Screening Level
SI	Site Inspection
SIR	Site Inspection Report
SOP	Standard Operating Procedure
SVOC	Semi-Volatile Organic Compounds
Tucson Water	City of Tucson
URS	URS Corporation
USAF	United States Air Force
USEPA	United States Environmental Protection Agency
VAS	Vertical Aquifer Samples
VOC	Volatile Organic Compounds

EXECUTIVE SUMMARY

This Addendum 01 to the Final Site Inspection (SI) Report (SIR) was prepared by Amec Foster Wheeler Programs, Inc., together with affiliate Wood Environment & Infrastructure Solutions, Inc. (formerly known as Amec Foster Wheeler Environment & Infrastructure, Inc.)¹, collectively referred to as Amec Foster Wheeler, under Contract No. FA8903-16-D-0027, Task Order 0004, to document the results of expanded SI activities conducted downgradient of aqueous film forming foam (AFFF) release areas located at Davis-Monthan Air Force Base (DMAFB). The AFFF release areas were identified by others during a Preliminary Assessment (PA) (HydroGeologic Inc. [HGL], 2015), or during an installation scoping visit conducted by Amec Foster Wheeler on 1 September 2016 and a Sampling Design and Rationale Teleconference held on 19 December 2016.

An initial SI was conducted in October 2017 to January 2018 by Amec Foster Wheeler to evaluate the presence of polyfluorinated alkyl substances (PFAS) in soil, groundwater, surface water, and sediment at and around AFFF Release Areas 1, 2 and 3 (Amec Foster Wheeler, 2019a). PFAS in groundwater did not exceed their respective screening levels during the initial SI; however, on 13 November 2017, the Air Force Civil Engineer Center (AFCEC) Remedial Project Manager (RPM) informed Amec Foster Wheeler of perfluorooctane sulfonate (PFOS) + perfluorooctanoic acid (PFOA) detections above the United States Environmental Protection Agency (USEPA) lifetime Health Advisory (HA) value of 0.07 micrograms per liter ($\mu\text{g}/\text{l}$) in City of Tucson (Tucson Water) municipal production wells C-007A and C-014B located downgradient of AFFF Release Area 3 at the northern installation boundary.

Based on the PFOS and PFOA levels in the aforementioned municipal supply wells and the presence of 277 potential (b) (6) drinking water wells identified during a desktop survey located within (b) (6) distance of the installation boundary, expanded SI activities were initiated in February 2019. The expanded SI activities included the installation and sampling of two installation boundary monitoring wells and the performance of a well reconnaissance within a 4-mile distance downgradient of the installation boundary to verify the presence of potential drinking water supply wells identified during the initial SI.

The data presented in this Addendum 01 to the SIR were collected and evaluated in accordance with the Final Addendum 01 Installation-Specific Work Plan (ISWP) (Amec Foster Wheeler, 2019b) and the General Quality Program Plan (Amec Foster Wheeler, 2018) and are intended to supplement the information presented in the SIR (Amec Foster Wheeler, 2019a). An overview of PFAS and a discussion of the background for each AFFF release area are provided in the SIR (Amec Foster Wheeler, 2019a).

¹ Amec Foster Wheeler Environment & Infrastructure, Inc. changed its name on 6 April 2018 to Wood Environment & Infrastructure Solutions, Inc., to reflect Wood Group's acquisition of Amec Foster Wheeler. All resource documents created and activities conducted under Amec Foster Wheeler Environment & Infrastructure, Inc., remain in place, will be referred to Amec Foster Wheeler, and are executed under Wood Environment & Infrastructure Solutions, Inc.

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

The primary objectives of this expanded SI were to:

- Determine if concentrations of PFOS, PFOA, or the sum of PFOS and PFOA, in groundwater exceed the USEPA HA value of 0.07 µg/L, and if PFBS concentrations in groundwater exceed the USEPA Tap Water Regional Screening Level (RSL) of 40 µg/L, downgradient of AFFF Release Area 3 (Stormwater Outfall Canal) at the northern installation boundary and upgradient of Tucson Water municipal supply wells C-007A and C-014B;
- Vertically delineate the presence/absence of PFOS, PFOA, and PFBS in groundwater samples collected during monitoring well borehole advancement;
- Collect additional hydrogeological data to better understand aquifer characteristics and groundwater flow near the northern installation boundary; and,
- Verify the presence of potential drinking water supply wells identified during the initial SI.

Expanded SI PFAS Analytical Results and Receptors

PFOS, PFOA and PFOS+PFOA were detected in groundwater samples collected at various depth intervals during borehole advancement for monitoring installation downgradient of AFFF Release Area 3 at concentrations exceeding the USEPA lifetime HA values, while PFBS was detected at concentrations below the USEPA Tap Water RSL. Maximum concentrations were identified near the groundwater interface at approximately 296 feet below ground surface (bgs) with subsequent concentrations decreasing with depth. However, PFOS/PFOA were not detected within the screened intervals of the installed monitoring wells during subsequent groundwater sampling. Based on these results, human groundwater receptors via the ingestion pathway are potentially present due to the presence of drinking water supply wells identified during the initial SI and expanded SI well reconnaissance. Further investigation in the form of a door-to-door well survey and subsequent drinking water well sampling, if drinking water wells are verified, is recommended to determine if drinking water receptor pathways with immediate impacts to human health are complete.

1.0 INTRODUCTION

This Addendum 01 to the Final Site Inspection (SI) Report (SIR) was prepared by Amec Foster Wheeler Programs, Inc., together with affiliate Wood Environment & Infrastructure Solutions, Inc. (formerly known as Amec Foster Wheeler Environment & Infrastructure, Inc.)¹, collectively referred to as Amec Foster Wheeler, under Contract No. FA8903-16-D-0027, Task Order 0004, to document the results of expanded SI activities conducted downgradient of an aqueous film forming foam (AFFF) release area located at Davis-Monthan Air Force Base (DMAFB) in Tucson, Arizona (**Figure 1.0-1**).

The data presented in this Addendum 01 to the SIR were collected and evaluated in accordance with the Final Addendum 01 Installation-Specific Work Plan (ISWP) (Amec Foster Wheeler, 2019b) and the General Quality Program Plan (QPP) (Amec Foster Wheeler, 2018) and are intended to supplement the information presented in the Final SIR (Amec Foster Wheeler, 2019a). An overview of per- and polyfluorinated alkyl substances (PFAS) and a discussion of the background for each AFFF release area are provided in the Final SIR (Amec Foster Wheeler, 2019a).

Table 1.0-1 presents the screening values used for comparison to the PFOS, PFOA, and perfluorobutanesulfonic acid (PFBS) analytical results obtained during the expanded SI. The USEPA has not issued HA values or promulgated standards for the remaining PFAS to date; therefore, only the results of PFOS, PFOA, PFOS+PFOA, and PFBS are discussed in detail and presented in figures in this Addendum 01 to the SIR. However, all PFAS data are presented in the groundwater analytical tables.

The Arizona Department of Environmental Quality (ADEQ) has not issued screening criteria or promulgated standards for any PFAS constituent to date.

¹ Amec Foster Wheeler Environment & Infrastructure, Inc. changed its name on 6 April 2018 to Wood Environment & Infrastructure Solutions, Inc., to reflect Wood Group's acquisition of Amec Foster Wheeler. All resource documents created and activities conducted under Amec Foster Wheeler Environment & Infrastructure, Inc., remain in place, will be referred to Amec Foster Wheeler, and are executed under Wood Environment & Infrastructure Solutions, Inc.

Table 1.0-1. Regulatory Screening Values.

Parameter	Chemical Abstract Number	USEPA Regional Screening Level Table (November 2017) ^a Tap Water (µg/L)	USEPA Health Advisory for Drinking Water (Groundwater) ^b (µg/L)
PFOS	1763-23-1	NL	0.07 ^c
PFOA	335-67-1	NL	
PFBS	375-73-5	40	NL

Notes:

- a USEPA Regional Screening Levels (2017a) [<https://semspub.epa.gov/work/HQ/197027.pdf>].
 - b USEPA, May 2016a. “Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)” and USEPA, May 2016b. “Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA).”
 - c When both PFOA and PFOS are both present, the combined concentrations of PFOA and PFOS should be compared with the 0.07 µg/L health advisory level.
- PFOA - perfluorooctanoic acid
 µg/L - micrograms per liter
 NL - not listed
 PFBS - perfluorobutanesulfonic acid
- PFOS - perfluorooctanesulfonic acid
 RSL - Regional Screening Level
 USEPA - United States Environmental Protection Agency

1.1 PROJECT OBJECTIVES

In accordance with Department of Defense (DoD) Instruction 4715.18, *Emerging Contaminants* (ECs) (DoD, 2009), the *Interim Air Force Guidance on Sampling and Response Actions for Perfluorinated Compounds at Active and Base Realignment and Closure Installations* (USAF, 2012), and the *SAF/IE Policy on Perfluorinated Compounds of Concern* (USAF, 2016) the United States Air Force (USAF) will:

- Identify locations where there is a reasonable expectation that there may have been a release of PFAS (defined below) associated with USAF actions;
- Determine if there is unacceptable risk to human health and the environment; and,
- Address releases that pose an unacceptable risk, including offsite migration.

The primary objectives of this expanded SI were to:

- Determine if concentrations of PFOS, PFOA, or the sum of PFOS and PFOA, in groundwater exceed the USEPA HA value of 0.07 micrograms per liter (µg/l), and if PFBS concentrations in groundwater exceed the USEPA Tap Water Regional Screening Level (RSL) of 40 µg/l, downgradient of AFFF Release Area 3 (Stormwater Outfall Canal) at the northern installation boundary and upgradient of Tucson Water municipal supply wells C-007A and C-014B;
- Vertically delineate the presence/absence of PFOS, PFOA and PFBS in groundwater during monitoring well borehole advancement;
- Collect additional hydrogeological data to better understand aquifer characteristics and groundwater flow near the northern installation boundary; and,

- Verify the presence of potential drinking water supply wells identified during the initial SI.

1.2 PROJECT SCOPE

AFFF Release Area 3 was recommended for expanded SI at DMAFB based on the results of the initial SI and subsequent receipt of additional groundwater quality data from two Tucson Water downgradient municipal supply wells. In order to evaluate the potential for off-base migration of PFOS, PFOA, and PFBS, expanded SI activities included:

- Collection and laboratory analysis of five Vertical Aquifer Samples (VAS) collected during monitoring well borehole advancement;
- Installation and sampling of two permanent installation boundary monitoring wells (MW03002 and MW03003) with screen intervals corresponding to the pumping intervals of Tucson Water municipal supply wells C-007A and C-014B located downgradient of the northern installation boundary; and,
- Performance of a well reconnaissance within a 4-mile distance downgradient of the installation boundary to verify the presence of potential drinking water wells identified during a desktop survey in the initial SI.

This Addendum 01 to the SIR discusses and provides a comparison of the analytical results to screening values for PFOS, PFOA, and PFBS in groundwater. The remaining PFAS do not have screening values; therefore, only the results of PFOS, PFOA, and PFBS are discussed in detail and presented in figures. However, all data are presented in the groundwater analytical tables.

This page intentionally left blank.

2.0 BACKGROUND

Complete details on site location, setting, history and previous investigations performed at DMAFB are summarized in the Final SIR (Amec Foster Wheeler, 2019a).

2.1 SITE LOCATION AND SETTING

DMAFB is located in Pima County, within the city limits of Tucson, Arizona (**Figure 1.0-1**). The facility was established in 1925 and encompasses approximately 11,000 acres (URS Corporation [URS],2011).

2.2 SITE HISTORY

DMAFB was originally established as Tucson Landing Field in 1925. The Strategic Air Command stationed two B-29 bombardment groups at the facility in 1946, which remained until it was transferred to the Tactical Air Command in 1976. The 355th Wing is currently the host unit at DMAFB. The Wing's missions are to train A-10 and OA-10 pilots and to provide support and forward air control to ground forces worldwide. The 355th Wing also provides command, control, and communications countermeasures in support of tactical forces with the EC-130H aircraft (URS, 2011).

The total population of the installation is approximately 12,200, composed of approximately 7,000 military personnel, 3,200 dependents, and an estimated 2,000 civilian non-residents who commute to the installation daily. The developed portions of DMAFB include aviation support, industrial, institutional, commercial, residential, public and recreational facilities, agricultural land, and an airfield with an associated 13,645 foot (ft) long runway. In addition to the main installation, DMAFB includes the Air Force Materiel Command's Aerospace Maintenance and Regeneration Group; an industrial complex within the contiguous property that provides long-term aircraft preservation and storage, as well as parts reclamation (URS, 2011).

2.3 PREVIOUS SITE INSPECTION ACTIVITIES

AFFF release areas were identified by others during a Preliminary Assessment (PA) (HydroGeologic Inc. [HGL], 2015), and during an installation scoping visit conducted by Amec Foster Wheeler on 1 September 2016 and a Sampling Design and Rationale Teleconference held on 19 December 2016.

An initial SI was conducted between October 2017 and January 2018 by Amec Foster Wheeler to evaluate the presence of PFAS in soil, groundwater, surface water, and sediment at and around AFFF Release Areas 1, 2 and 3 (Amec Foster Wheeler, 2019a).

SI Analytical Results

Soil was collected for laboratory analysis at AFFF Release Areas 1, 2, and 3. PFOS and PFOA were detected in surface soil at concentrations exceeding the calculated RSLs based on a residential exposure scenario at AFFF Release Area 1. PFOS and PFOA were not detected in subsurface soil at concentrations exceeding

the calculated RSLs based on a residential exposure scenario at any of the Release Areas. PFBS was not detected at concentrations above the USEPA RSL at any release area.

Groundwater was collected for laboratory analysis at AFFF Release Areas 1, 2, and 3. PFOS, PFOA and/or PFOS+PFOA were not detected in groundwater at concentrations exceeding the USEPA lifetime Health Advisory (HA) values and PFBS was not detected at concentrations above the USEPA Tap Water RSL at any Release Areas.

Sediment was collected for laboratory analysis at AFFF Release Areas 1 and 3. PFOS was detected in sediment at a concentration exceeding the calculated RSL based on a residential exposure scenario at AFFF Release Area 1. PFOA and PFBS were not detected at concentrations above the respective RSLs at either release area.

The SI also included a desktop survey of potential private and public water supply wells within a 1-mile and 4-mile distance of the installation boundary to identify potential receptor pathways and down-stream and/or downgradient receptors. The desktop survey included a review of the Arizona Department of Water Resources (ADWR) Wells 55 Registry (ADWR, 2018). A total of 2,256 wells were identified within a (b) (6) distance of the installation, 277 of which are potential drinking water wells located (b) (6) of the installation boundary. Of the 277 (b) (6) wells, 112 wells were identified as (b) (6) wells, 115 were identified as municipal use wells, and 50 wells were identified as production, reserved, or of unknown use.

2.3.1 Rationale for Expanded SI

On 13 November 2017, the Air Force Civil Engineer Center (AFCEC) Remedial Project Manager (RPM) informed Amec Foster Wheeler of PFOS + PFOA detections above the USEPA lifetime HA value of 0.07 µg/l in Tucson Water municipal production wells C-007A and C-014B located downgradient of AFFF Release Area 3 (Stormwater Outfall Canal) at the northern installation boundary. Well C-007A is screened from 266 to 380 feet below ground surface (bgs) with a pump intake depth of 441 feet bgs and total depth of approximately 641 feet bgs, while well C-014B is screened from approximately 260 to 780 feet bgs with an approximate pump intake depth of 445 feet bgs.

New and existing groundwater monitoring wells at DMAFB are screened in the Fort Lowell and Tinaja Bed formations. The groundwater flow direction at DMAFB during the initial SI was generally toward the north and northwest with depth to groundwater ranging from 282 to 350 feet bgs. MW03001 (AFFF Release Area 3) is screened within the Fort Lowell formation at a depth interval of 301 to 321 feet bgs, while ST-35-MW-42 (AFFF Release Area 2) is screened within the Tinaja Bed formation from 318 to 368 feet bgs. PFOS, PFOA, or PFBS were not detected in MW03001 while PFOA and PFBS were below USEPA HA values and Tap Water RSLs, respectively, in deeper well ST-35-MW-42. There are no additional monitoring wells within the base boundary screened at deeper intervals than the wells sampled during the initial SI.

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

Based on the PFOS and PFOA levels in the aforementioned municipal supply wells and the presence of 277 potential (b) (6) drinking water wells identified during a desktop survey located within (b) (6) distance of the installation boundary, expanded SI activities were initiated in February 2019.

This page intentionally left blank.

3.0 EXPANDED SI FIELD ACTIVITIES AND ANALYTICAL PROTOCOL

Amec Foster Wheeler prepared and submitted an Addendum 01 to the ISWP (Amec Foster Wheeler, 2019b) for expanded SI activities based on discussions between Amec Foster Wheeler, DMAFB, and AFCEC personnel. Expanded SI well installation and sampling activities were conducted at DMAFB from 28 February to 6 April 2019, and a 4-mile well reconnaissance was performed from 20 to 30 May 2019.

The primary objectives of this expanded SI were to:

- Determine if concentrations of PFOS, PFOA, or the sum of PFOS and PFOA, in groundwater exceed the USEPA HA value of 0.07 µg/l, and if PFBS concentrations in groundwater exceed the USEPA Tap Water RSL of 40 µg/l, downgradient of AFFF Release Area 3 (Stormwater Outfall Canal) at the northern installation boundary and upgradient of Tucson Water municipal supply wells C-007A and C-014B;
- Vertically delineate the presence/absence of PFOS, PFOA, and PFBS in groundwater during monitoring well borehole advancement;
- Collect additional hydrogeological data to better understand aquifer characteristics and groundwater flow near the northern installation boundary; and,
- Verify the presence of potential drinking water supply wells identified during the initial SI .

In order to evaluate the potential for off-base migration of PFAS, expanded SI activities included:

- Collection and laboratory analysis of five VAS collected during boring advancement;
- The installation and sampling of two permanent installation boundary monitoring wells (MW03002 and MW03003) with screen intervals corresponding to the pumping intervals of Tucson Water Municipal Supply Wells C-007A and C-014B located downgradient of the installation boundary; and,
- Performance of a well reconnaissance within a 4-mile distance downgradient of the installation boundary to verify the presence of potential drinking water wells identified during a desktop survey in the initial SI.

Photographic documentation of the expanded SI activities is provided in **Appendix A** and field documentation is provided in **Appendix B**. Expanded SI activities were recorded by field personnel on field activity daily logs (**Appendix B-1**), and daily PFAS protocol checklists were completed to document that procedures were followed to prevent introduction of PFAS into field samples (**Appendix B-2**). A tailgate safety meeting was conducted each morning prior to beginning work; tailgate safety meeting reports are provided in **Appendix B-3**.

Environmental Sampling

Groundwater samples were collected as part of the expanded SI activities at DMAFB. All samples collected were analyzed for the 16 PFAS analytical suite listed in QAPP Worksheet #11 by SGS Accutest Laboratories (Accutest), a Department of Defense Environmental Laboratory Accreditation Program accredited

laboratory located in Orlando, Florida. Accutest analyzed the samples for PFAS by Modified USEPA Method 537 using Liquid Chromatography and Tandem Mass Spectrometry (LC-MS/MS).

Vertical Aquifer Sampling

Discrete depth samples were collected during borehole advancement of monitoring wells MW03002 and MW03003 (**Figure 3.0-1**) to determine the vertical distribution of PFOS/PFOA in groundwater. The samples were collected beginning at first encountered groundwater and at approximately 50-foot depth intervals thereafter to the total boring depth and were analyzed on an expedited turnaround time of five days.

Approximate ground surface elevations of C-007A and C-014B indicate that the drilling locations for MW03002 and MW03003 are approximately 3 feet lower and 7 feet higher in elevation, respectively. As such, the borings for MW03002 and MW03003 were advanced to total depths of 458 and 462 feet bgs, respectively, to install the approximate mid-point of the monitoring well screen elevations corresponding to the pump intake elevations at C-007A and C-014B.

Selected sample intervals were based on lithology and conditions encountered during drilling. VAS were collected via stainless steel Hydropunch Sampler and disposable high-density polyethylene (HDPE) bailers in accordance with Standard Operating Procedure (SOP) AFW-03 *Groundwater Sampling* and SOP AFW-16 *Vertical Aquifer Screening* (Appendix D, General QPP).

Monitoring Well Installation and Development

The borings for new permanent groundwater monitoring wells MW03002 and MW03003 were initially advanced at DMAFB to a depth of 5 feet bgs with a hand auger and then advanced to planned depths using RotoSonic drilling technology. Soil cores were screened with a photoionization detector (PID) for volatile organic vapors and logged by a qualified geoscientist in accordance with the Unified Soil Classification System. Soil samples were not collected for laboratory analysis during the expanded SI activities. Drilling information, PID readings, and lithologic logging observations are included in the Soil Boring/Monitoring Well records in **Appendix B-4**.

Well C-007A is located downgradient of the Stormwater Outfall Canal and is screened from 266 to 380 feet bgs with a pump intake depth of 441 feet bgs and total depth of approximately 641 feet bgs. The MW03002 surface location is approximately 3-feet lower in elevation than the surface location of C-007A. MW03002 was designed to target a total depth of 449 feet bgs to center the approximate midpoint of the screen interval to correspond to the pumping depth of 441 feet bgs at C-007A. Based on lithology and conditions encountered during drilling, the boring was advanced to a total depth of 458 feet bgs with the screen placed from 435 to 455 feet bgs.

Well construction details of C-014B document the screened interval is from 260 to 780 feet with an approximate pump intake depth of 445 feet bgs. The MW03003 drilling location is approximately 7-feet higher in elevation than the location of C-014B. MW03003 was designed to target a total depth of 462

feet bgs to center the approximate midpoint of the screen interval to correspond to the pumping depth of 445 feet bgs at C-014B. Based on lithology and conditions encountered during drilling, the boring was advanced to a total depth of 462 feet bgs with the screen placed from 430 to 450 feet bgs.

A third monitoring well, MW03004, was proposed to be installed to target the groundwater interface east of MW03002 and cross-gradient of C-007A; however, this well was not installed based on the analytical data obtained from the discrete depth sampling, as discussed in Section 3.1.

The monitoring wells were constructed of threaded 4-inch-diameter, Schedule 80 polyvinyl chloride (PVC) casing, 0.020-inch machine-slotted 4-inch-diameter Schedule 80 PVC 20-foot length well screen, and PVC end caps. The annular space surrounding the well screen was backfilled via tremie pipe with clean 10/20 silica sand to approximately 3 feet above the top of the well screen during drill-casing withdrawal. A minimum 3-foot bentonite transition seal was then installed above the filter pack and allowed to sufficiently hydrate. The remaining borehole annulus was filled with cement bentonite grout. The permanent monitoring wells were completed above grade and fitted with an expandable locking cap housed in a 12-inch-diameter 3.5-foot-high stovepipe with a bolt-down lid set in a 2-foot by 2-foot sloped concrete pad with three surrounding protective bollards. The monitoring wells were installed in general accordance with SOP AFW-04, *Monitoring Well Installation* (Appendix D, General QPP). Well construction details for wells installed during the expanded SI are presented in **Table 3.0-1** and illustrated in the Soil Boring/Monitoring Well Records provided in **Appendix B-4**.

The monitoring wells were initially developed using the surge and bail method to remove sediment followed by pumping with a non-dedicated PFAS-free stainless-steel submersible pump fitted with 1-inch PVC pipe a minimum of 24 hours after borehole completion, in accordance with SOP AFW-05, *Monitoring Well Development* (Appendix D, General QPP). Water quality parameters (pH, specific conductance, temperature, oxidation-reduction potential [ORP], dissolved oxygen [DO], and turbidity) of the development water were measured and recorded on well development logs, and a minimum of three saturated casing volumes of water were purged from each new well during development. Well development continued until the water quality parameters have stabilized and the development water was generally sediment-free or clear (less than 50 nephelometric turbidity units). Decontamination procedures of equipment used for development can be found in SOP AFW-10, *Equipment Decontamination* (Appendix D, General QPP). The development information was recorded on Well Development forms provided in **Appendix B-5**.

Groundwater Sampling

Groundwater samples were collected from the two new monitoring wells on 5 and 6 April 2019. Static depth to groundwater measurements were collected from all available new and existing monitoring wells for use in potentiometric level calculation and groundwater contouring prior to initiating groundwater sampling activities. Depth to groundwater measurements and calculated groundwater elevations are provided in **Table 3.0-2** and groundwater elevations with contours are depicted on **Figure 3.0-1**.

Groundwater purging and sampling was conducted with a non-dedicated stainless steel PFAS-free submersible pump free of Teflon components and outfitted with PVC pipe. Water levels and quality parameters (pH, specific conductance, temperature, ORP, DO, and turbidity) were periodically measured with a multi-purpose water quality meter and turbidity meter until all parameters stabilize in accordance with SOP AMEC-03, *Groundwater Sampling* (Appendix D, General QPP). Decontamination procedures of equipment used for sampling can be found in SOP AFW-03, *Groundwater Sampling* and SOP AFW-10, *Equipment Decontamination* (Appendix D, General QPP). Groundwater sampling equipment was calibrated prior to use, with the resulting data recorded on water quality sampling instrument calibration forms provided in **Appendix B-6**. Groundwater samples were collected in laboratory-provided HDPE containers. The sample containers were sealed, labeled, packed on ice in an insulated cooler, and delivered to Accutest under Chain-of-Custody protocol. Groundwater sampling activities were documented on Groundwater Sampling Records provided in **Appendix B-7**.

Total Sample Counts

The following provides a summary of samples (including field duplicate samples) collected during expanded SI activities at DMAFB:

- Six VAS (including one duplicate sample), two groundwater samples, one field blank, and eight equipment blanks were collected during borehole advancement and subsequent to installation of the two new permanent monitoring wells.

Samples collected during the expanded SI were analyzed for the following 16 PFAS compounds:

- PFOS;
- PFOA;
- PFBS;
- Perfluoroheptanoic acid (PFHpA);
- Perfluorohexanesulfonic acid (PFHxS);
- Perfluorononanoic acid (PFNA);
- N-Ethyl perfluorooctanesulfonamidoacetic acid (NEtFOSAA);
- N-Methyl perfluorooctanesulfonamidoacetic acid (NMeFOSAA);
- Perfluorodecanoic acid (PFDA);
- Perfluorotetradecanoic acid (PFTA);
- Perfluorododecanoic acid (PFDoA);
- Perfluorohexanoic acid (PFHxA);
- Perfluorotridecanoic acid (PFTrDA);
- Perfluoroundecanoic acid (PFUnA);
- 6:2 fluorotelomer sulfonate (FTS); and
- 8:2 FTS.

The VAS and monitoring well groundwater samples were analyzed by Accutest by Modified USEPA Method 537 using LC-MS/MS. The LC-MS/MS method provides acceptable detection limits to confirm the presence of PFAS listed above. The laboratory analytical reports for the PFAS samples collected during the expanded SI are included in **Appendix C**.

Analytical results for PFOS, PFOA, and PFBS are discussed in the following sections, while the analytical results for the remaining PFAS constituents are provided in **Table 3.1-1**.

Co-occurrence of PFOS and PFOA (PFOS + PFOA) in aqueous samples was reported using the following guidelines:

1. If PFOS and PFOA are both detected at concentrations at or above the laboratory detection limit (DL) in groundwater, then the reported concentration for PFOA was added to the reported concentration for PFOS.
2. If only PFOS or only PFOA is detected at or above the DL in groundwater, then the concentration of the detected analyte only is reported.
3. If neither PFOA nor PFOS are detected at concentrations at or above the DL, then co-occurrence was reported as *Not Detected*.

Data Validation and Usability Assessment

Analytical laboratory data from the VAS and monitoring well groundwater samples collected and analyzed for PFAS in March and April 2019 were validated by Amec Foster Wheeler in May 2019. During validation, Amec Foster Wheeler evaluated a total of 128 data records from field samples and J or UJ qualified 22 records (17.2%) as estimated values because of high or low surrogate recoveries, low matrix spike recoveries, and/or analyte concentrations between the DL and the limit of quantification (LOQ).

During validation, Amec Foster Wheeler J qualified PFOA and PFOS results from sample DAVIS03-GW-005 and the PFOA result from sample DAVIS03-GW-006 because analyte concentrations were between the DL and LOQ. All qualified PFOA and PFOS results were less than the HA of 0.07 µg/L and the uncertainty in analytical results is not interpreted to adversely affect overall data usability. The data validation reports for the PFAS samples collected during the expanded SI are included in **Appendix C**.

Groundwater Elevations

Additional hydrogeological data via depth to groundwater measurements were collected on 2 April 2019 from the two newly installed monitoring wells and eight existing wells. Depth to groundwater ranged from 282.75 to 351.86 feet below top of casing, with the calculated groundwater elevations ranging from 2,261.03 to 2,428.69 feet above mean sea level (**Table 3.0-2**). Groundwater flow was generally to the northwest at an average hydraulic gradient of 0.008 ft/ft (**Figure 3.0-1**).

Investigation-Derived Waste

Investigation-derived waste (IDW) consisted of soil cuttings, drilling water, well development water, groundwater sampling purge water, decontamination water, disposable personal protective equipment (PPE), and other miscellaneous refuse. Used PPE and other miscellaneous refuse was placed in plastic bags and discarded in an on-site sanitary trash container for disposal at a sanitary landfill. Soil cuttings were placed in roll off bins. Liquid IDW generated from equipment decontamination, drilling, and monitoring well development and purging activities was placed into a baker tank. IDW containers were appropriately labeled with site/contact information and contents and were staged in a designated area. Pending waste characterization results, IDW will be profiled and transported off-site by a licensed waste hauler to a permitted disposal facility. A designated United States Air Force representative will oversee IDW loading for transport and disposal and will sign all manifests/bills of lading. Copies of the bills of lading/manifests will be provided to AFCEC under separate cover.

Soil IDW

An aliquot of soil was collected from the soil cuttings every 20 feet during borehole advancement. The soil grab samples collected from soil cuttings were placed into a stainless-steel bowl and mixed with a stainless-steel spoon when each roll off bin has reached maximum capacity to form a representative composite sample for each individual bin. The required number of samples were collected from the composited soil sample and transferred directly into laboratory-provided containers, labeled, packed on ice in insulated coolers, and delivered under chain-of-custody protocol to the selected laboratory. The samples were analyzed by SGS Accutest laboratory for PFAS, volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, herbicides, and metals, polychlorinated biphenyls (PCBs), total petroleum hydrocarbons (gasoline range organics [GRO] and diesel range organics [DRO]), flashpoint, pH, sulfide, and cyanide, to determine the applicable disposal option.

Liquid IDW

The liquid IDW from monitoring well development/purge water and equipment decontamination water was collected in a poly tank, and a composite sample was retrieved from the tank at the conclusion of drilling and sampling activities using a dedicated HDPE bailer. The samples were decanted directly into laboratory-provided containers, labeled, packed on ice in insulated coolers, and delivered under chain-of-custody protocol to the selected laboratory. The samples were analyzed by SGS Accutest laboratory for PFAS, VOCs, SVOCs, pesticides, herbicides, metals, PCBs, total petroleum hydrocarbons (GRO and DRO), flashpoint, pH, sulfide, and cyanide to determine the applicable disposal option.

Surveying

The two newly installed monitoring well locations and top of casing elevations were surveyed by an Arizona-licensed surveyor (Amec Foster Wheeler) on 4 April 2019. Horizontal coordinates were surveyed based on North American Datum of 1983. Groundwater surface and top-of-casing elevations were

collected based on North American Vertical Datum of 1988. The survey data are included in **Table 3.0-1** and provided in **Appendix E**.

3.1 AFFF RELEASE AREA 3 (STORMWATER OUTFALL CANAL)

3.1.1 Sample Location and Methodologies

Monitoring wells MW03002 and MW03003 were installed on 12 and 27 March 2019 within the Tinja Formation from 435 to 455 feet bgs and 430 to 450 feet bgs, respectively (**Figure 3.1-1**).

- Six VAS (including one field duplicate) were collected during boring advancement to define PFAS concentrations vertically, as listed below.
 - MW03002
 - 326 feet bgs (including one field duplicate)
 - 396 feet bgs
 - MW03003
 - 296 feet bgs
 - 346 feet bgs
 - 392 feet bgs
- Two groundwater samples were collected from MW03002 and MW03003 on 5 and 6 April 2019 to assess the presence and concentrations of PFAS in groundwater within the corresponding pumping intervals of downgradient Tucson Water Supply Wells C-007A and C-014B, respectively.

3.1.2 Analytical Results

The PFAS analytical results are provided in **Table 3.1-1**, illustrated on **Figure 3.1-1**, and summarized below.

MW03002 VAS (326-327):

- PFOS was detected above the USEPA HA value at a maximum concentration of 13.0 µg/L (in the field duplicate).
- PFOA was detected above the USEPA HA value at a maximum concentration of 1.35 µg/L (in the field duplicate).
- PFOS+PFOA was detected above the USEPA HA value at a maximum concentration of 14.4 µg/L (in the field duplicate).
- PFBS was detected below the USEPA Tap Water RSL at a maximum concentration of 0.592 µg/L (in the field duplicate).

MW03002 VAS (396-397):

- PFOS was detected above the USEPA HA value at a concentration of 4.2 µg/L.
- PFOA was detected above the USEPA HA value at a concentration of 0.351 µg/L.
- PFOS+PFOA was detected above the USEPA HA value at a concentration of 4.55 µg/L.
- PFBS was detected below the USEPA Tap Water RSL at a concentration of 0.141 µg/L.

MW03002 Groundwater Sample (435-455):

- PFOS was not detected.
- PFOA was not detected.
- PFBS was not detected.

MW03003 VAS (296-297):

- PFOS was detected above the USEPA HA value at a concentration of 0.168 µg/L.
- PFOA was detected above the USEPA HA value at a concentration of 0.767 µg/L.
- PFOS+PFOA was detected above the USEPA HA value at a concentration of 0.935 µg/L.
- PFBS was detected below the USEPA Tap Water RSL at a concentration of 0.164 µg/L.

MW03003 VAS (346-347):

- PFOS was detected below the USEPA HA value at an approximate concentration of 0.0121 µg/L.
- PFOA was detected below the USEPA HA value at an approximate concentration of 0.0236 µg/L.
- PFOS+PFOA was detected below the USEPA HA value at an approximate concentration of 0.0357 µg/L.
- PFBS was detected below the USEPA Tap Water RSL at an approximate concentration of 0.0107 µg/L.

MW03003 VAS (392-393):

- PFOS was detected below the USEPA HA value at a concentration of 0.0239 µg/L.
- PFOA was detected below the USEPA HA value at an approximate concentration of 0.0095 µg/L.
- PFOS+PFOA was detected below the USEPA HA value at an approximate concentration of 0.0334 µg/L.
- PFBS was detected below the USEPA Tap Water RSL at an approximate concentration of 0.005 µg/L.

MW03003 Groundwater Sample (430-450):

- PFOS was not detected.
- PFOA was not detected.
- PFBS was not detected.

3.1.3 Conclusions

PFOS, PFOA and PFOS+PFOA were detected in VAS at concentrations exceeding the USEPA lifetime HA values and PFBS was detected at concentrations below the USEPA Tap Water RSL at AFFF Release Area 3. Maximum concentrations were identified at the groundwater interface at approximately 296 feet bgs with concentrations decreasing with depth. PFOS/PFOA were not detected within the screened intervals of the installed monitoring wells during subsequent groundwater sampling.

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

3.2 4-MILE WELL RECONNAISSANCE

Amec Foster Wheeler performed a desktop survey of potential drinking water wells within a 4-mile distance of the installation boundary during the initial SI to identify potential receptor pathways and down-stream and/or downgradient receptors (Amec Foster Wheeler, 2019a). The desktop survey included a review of the ADWR Wells 55 Registry (ADWR, 2018). A total of 2,256 wells were identified within a 4-mile distance of the installation, 277 of which are potential drinking water wells located (b) (6) of the installation boundary. Of the 277 (b) (6) wells, 112 wells were identified as (b) (6) wells, 115 were identified as municipal use wells, and 50 wells were identified as production, reserved, or of unknown use.

Amec Foster Wheeler performed a 4-mile well reconnaissance from 20 to 30 May 2019 to verify the presence of potential drinking water wells identified during from the desktop survey conducted during the initial SI. The original 277 wells were reduced to 252 wells subsequent to further ADWR well document review that identified wells that had already been abandoned or reported as destroyed. Based on the well reconnaissance (Table 3.2-1; Appendix A-1), 149 of the 252 wells are recommended for door-to-door confirmation and potential sampling to determine if drinking water exposure pathways are complete. The remaining 103 wells could not be visually located, did not appear to be active, or were reported as abandoned or destroyed and, therefore, would not require future sampling.

This page intentionally left blank.

4.0 MIGRATION/EXPOSURE PATHWAYS AND TARGETS

An updated base-wide conceptual site model table is provided as **Table 4.0-1**. The table provides an overview of the facility, physical, release, land use, exposure, and ecological profiles for Davis-Monthan AFB. The table has been updated to include information collected during the expanded SI. A detailed description of groundwater migration and exposure pathways are provided in the Final SIR (Amec Foster Wheeler, 2019a).

4.1 GROUNDWATER MIGRATION PATHWAY

PFAS, once in groundwater, are highly mobile due to their high solubility and low partition coefficient value, and once in groundwater, will migrate at approximately the same velocity as groundwater. PFAS are chemically and biologically stable in the environment and are resistant to processes of environmental degradation. As a result, these chemicals are extremely persistent in the environment, with a half-life greater than 41 years for PFOS and greater than 92 years for PFOA (USEPA, 2014). PFBS is generally less toxic and less bioaccumulative in wildlife and humans (USEPA, 2017a).

During the expanded SI activities, PFOS, PFOA and PFOS+PFOA were detected in VAS collected during borehole advancement of MW03002 and MW03003 at concentrations exceeding the USEPA lifetime HA values, while PFBS was detected at concentrations below the USEPA Tap Water RSL, at AFFF Release Area 3. Maximum concentrations were identified at the groundwater interface at approximately 296 feet bgs with concentrations decreasing with depth. PFOS/PFOA were not detected within the screened intervals of the installed monitoring wells during subsequent groundwater sampling.

Based on the current PFAS analytical results, groundwater at DMAFB is impacted with PFOS, PFOA and PFOS+PFOA at concentrations above the HA value at the Stormwater Outfall Canal (AFFF Release Area 3) located at the northwest installation boundary. As a result, AFFF Release Area 3 is considered a groundwater release area for pathway analysis.

The primary groundwater targets include potential private and public water supply wells within a 1-mile and 4-mile distance of the installation boundary downgradient (northwest) of AFFF Release Area 3 (Amec Foster Wheeler, 2019a). A total of 2,256 wells were identified within a 4-mile distance of the installation, 252 of which were potential drinking water wells located (b) (6) of the installation boundary (**Figure 3.2-1**). Of the 252 (b) (6) wells, 112 wells were identified as (b) (6) wells, 110 were identified as municipal use wells, and 30 wells were identified as production, reserved, or of other use. Based on the well reconnaissance survey, 149 of the 252 wells are recommended for door-to-door confirmation and potential sampling to determine if drinking water exposure pathways are complete. The remaining 103 wells could not be located, did not appear to be active, or were reported as abandoned or destroyed and, therefore, would not require future sampling.

The Stormwater Outfall Canal (AFFF Release Area 3) within the northern boundary of DMAFB is unlined within the installation boundary, where stormwater can flow into the canal and surrounding floodplain and infiltrate the streambed alluvium, recharging the underlying aquifer. Surface flow is extremely

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

variable, tending toward seasonal variations. Summer flows have greater velocity and transport larger quantities of suspended sediment. Winter flows have larger flow volumes and longer duration and may extend into the Canal's floodplain (Innovative Technical Solutions, Inc. [ITS], 2012). Sediment and surface soil analytical results indicate that the Canal collects stormwater from across the installation containing PFAS. PFAS may also have reached groundwater as a result of large infiltration events such as heavy rainfalls or floods. In these cases, water infiltrating from the surface may transfer contaminants present in the soil to groundwater. Large infiltration events have occurred periodically at the installation. Additionally, heavy rainfall or flood events have been shown to cause a temporary rise in water levels. Rising water may submerge contaminated soil and further increase the mass transfer of contaminants into the groundwater. As described above, the mass transfer of contaminants to groundwater may have periodically increased following large infiltration events.

Based on the expanded SI results, the Stormwater Outfall Canal is a source area for PFAS impacts to groundwater and human groundwater receptors via the ingestion pathway are potentially present in the form of private and municipal supply wells located downgradient of AFFF Release Area 3. Further investigation and evaluation of specific exposure conditions is required to determine if exposure pathways are complete.

4.2 GROUNDWATER EXPOSURE CONCLUSIONS

PFOS, PFOA and PFOS+PFOA were detected in VAS collected during borehole advancement of MW03002 and MW03003 at concentrations exceeding the USEPA lifetime HA values at AFFF Release Area 3. As a result, human groundwater receptors via the ingestion pathway are potentially present due to the presence of drinking water supply wells identified during the initial SI and expanded SI well reconnaissance. Further investigation in the form of a door-to-door well survey and subsequent drinking water well sampling, if drinking water wells are verified, is recommended to determine if drinking water receptor pathways with immediate impacts to human health are complete.

5.0 SUMMARY AND CONCLUSIONS

As stated in Section 1.0, the objectives of this expanded study were to:

- Determine if concentrations of PFOS, PFOA, or the sum of PFOS and PFOA, in groundwater exceed the USEPA HA value of 0.07 micrograms per liter ($\mu\text{g}/\text{l}$), and if PFBS concentrations in groundwater exceed the USEPA Tap Water Regional Screening Level (RSL) of 40 $\mu\text{g}/\text{l}$, downgradient of AFFF Release Area 3 (Stormwater Outfall Canal) at the northern installation boundary and upgradient of Tucson Water municipal supply wells C-007A and C-014B;
- Vertically delineate the presence/absence of PFOS, PFOA and PFBS in groundwater during monitoring well borehole advancement;
- Collect additional hydrogeological data to better understand aquifer characteristics and groundwater flow near the northern installation boundary; and,
- Verify the presence of potential drinking water supply wells identified during the initial SI.

Section 3 of this SIR Addendum 01 details the analytical results for PFAS at AFFF Release Area 3 included in this expanded SI. A summary table (**Table 5.0-1**) is also provided below which lists specific exceedances by media, fulfilling the objectives of the expanded SIR.

Table 5.0-1. Summary of Analytical Results and Screening Level Exceedances.

Location ID	Parameter	Maximum Detected Concentration	Screening Value	Units	Number of Samples*/ Number of Exceedances	Exceeds Screening Level	Potentially Complete DW Exposure Pathway	Recommendation
AFFF Release Area 3 (MW03002)	Groundwater						Yes	Advance to RI
	PFOS	13.0 ^A	0.07	µg/L	4/3	Yes		
	PFOA	1.35 ^A	0.07	µg/L	4/3	Yes		
	PFOS+PFO	14.4 ^A	0.07	µg/L	4/3	Yes		
	PFBS	0.592 ^A	40	µg/L	4/0	No		
AFFF Release Area 3 (MW03003)	Groundwater						Yes	Advance to RI
	PFOS	0.168	0.07	µg/L	4/1	Yes		
	PFOA	0.767	0.07	µg/L	4/1	Yes		
	PFOS+PFO	0.935	0.07	µg/L	4/1	Yes		
	PFBS	0.164	40	µg/L	4/0	No		

Notes:

* includes normal and field duplicate samples (count does not include QC samples)

^A Higher concentration observed in field duplicate sample

AFFF – aqueous film forming foam

bgs – below ground surface

DW – Drinking Water

ID - identification

µg/L – micrograms per liter

PFBS – perfluorobutanesulfonic acid

PFOA – perfluorooctanoic acid

PFOS – perfluorooctanesulfonic acid

RI – Remedial Investigation

Groundwater Receptors

PFOS, PFOA and PFOS+PFOA were detected in VAS collected during borehole advancement of MW03002 and MW03003 at concentrations exceeding the USEPA HA values at AFFF Release Area 3 (Stormwater Outfall Canal). Human groundwater receptors via the ingestion pathway are potentially present due to the identification of 252 potential drinking water wells (112 (b) (6) wells, 110 municipal supply wells, and 30 other wells) located within a (b) (6) of the Stormwater Outfall Canal. A well reconnaissance survey was subsequently performed in May 2019 during the expanded SI to verify the presence of the drinking water wells identified during the initial SI. Of the 252 wells, 149 wells are recommended for door-to-door confirmation and potential sampling to confirm the presence or absence of PFAS and to determine if exposure pathways are complete. The remaining 103 wells could not be located, did not appear to be active, or were reported as abandoned or destroyed and, therefore, would not require future sampling.

This section provides information about private drinking water sources. It contains personal privacy or other information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

6.0 REFERENCES

- Amec Foster Wheeler, 2018. *Final Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas Environmental Programs Worldwide, Quality Program Plan*. October 2018.
- Amec Foster Wheeler, 2019a. *Final Site Inspection Report, Davis-Monthan Air Force Base, Tucson Arizona*. February 2019.
- Amec Foster Wheeler, 2019b. *Final Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas, Environmental Programs Worldwide, Addendum 01 Installation-Specific Work Plan, Davis-Monthan Air Force Base, Tucson, Arizona*. February 2019.
- Arizona Department of Water Resources (ADWR), 2018. Well Registry Data. Website. <https://gisweb.azwater.gov/waterresourcedata/WellRegistry.aspx>
- DoD, 2009. *Department of Defense, Instruction Number 4715.18 Emerging Contaminants (ECs)*, 11 June.
- HydroGeologic, Inc. (HGL), 2015. *Final Preliminary Assessment Report for Perfluorinated Compounds at Davis-Monthan Air Force Base, Tucson, Arizona*. September.
- Innovative Technical Solutions, Inc., 2012. *2011 Analytical Data Report. Base wide Groundwater Monitoring Program. Davis Monthan Air Force Base, Arizona*. March.
- URS, 2011. *Final Technical Evaluation Report for Investigation of OWSs to Determine DERA Eligibility on Davis-Monthan Air Force Base*, September.
- United States Air Force (USAF), 2012. *Interim USAF Guidance on Sampling and Response Actions for Perfluorinated Compounds at Active and Base Realignment and Closure Installations*, August.
- USAF, 2016. *SAF/IE Policy on Perfluorinated Compounds (PFCs) of Concern*, August.
- USAF, 2018. *PFAS Site Inspection Objectives and Follow-On Activities*, March.
- United States Environmental Protection Agency (USEPA), 2014. *USEPA Fact Sheet. Emerging Contaminants Fact Sheet – PFOS and PFOA*, March.
- USEPA, 2016a. *Drinking Water Health Advisory for Perfluorooctane Sulfonate (PFOS)*, 19 May.
- USEPA, 2016b. *Drinking Water Health Advisory for Perfluorooctanoic Acid (PFOA)*, 19 May.
- USEPA, 2017a. *Regional Screening Levels*. Retrieved from <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017>.
- USEPA, 2017b. *Assessing and Managing Chemicals under TSCA, Per- and Polyfluoroalkyl Substances (PFASs) under TSCA*. Updated 13 March. <https://www.epa.gov/assessing-and-managing-chemicals-under-tsca/and-polyfluoroalkyl-substances-pfass-under-tsca>, accessed on 12 April 2017.

This page intentionally left blank.

FIGURES

FIGURE ACRONYMS

AFFF	aqueous film forming foam
ft bgs	feet below ground surface
HA	Health Advisory
µg/L	micrograms per liter
ND	not detected
PFAS	per- and polyfluorinated alkyl substances
PFBS	perfluorobutanesulfonic acid
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid

FIGURE NOTES

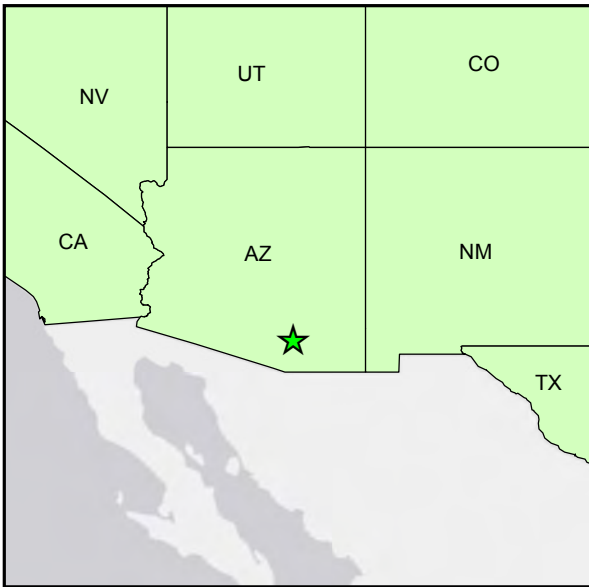
Shaded = Exceeds Regulatory Screening Value

Groundwater elevations in NAVD88 (feet)


^A Higher concentration observed in field duplicate sample

J = The analyte was positively identified, and the associated numerical value is the approximate concentration of the analyte in the sample

U = The analyte was analyzed for, but was not detected above the reported limit of detection



Air Force Civil Engineer Center
 2261 Hughes Ave., Suite 163
 JBSA Lackland, Texas 78236




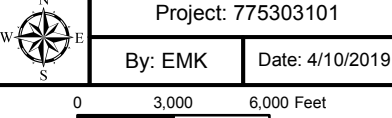
Symbol Key
 Davis-Monthan AFB Installation Boundary

FIGURE 1.0-1
Installation Location
 Davis-Monthan Air Force Base
 Tucson, Arizona

Project: 775303101
 By: EMK Date: 4/10/2019

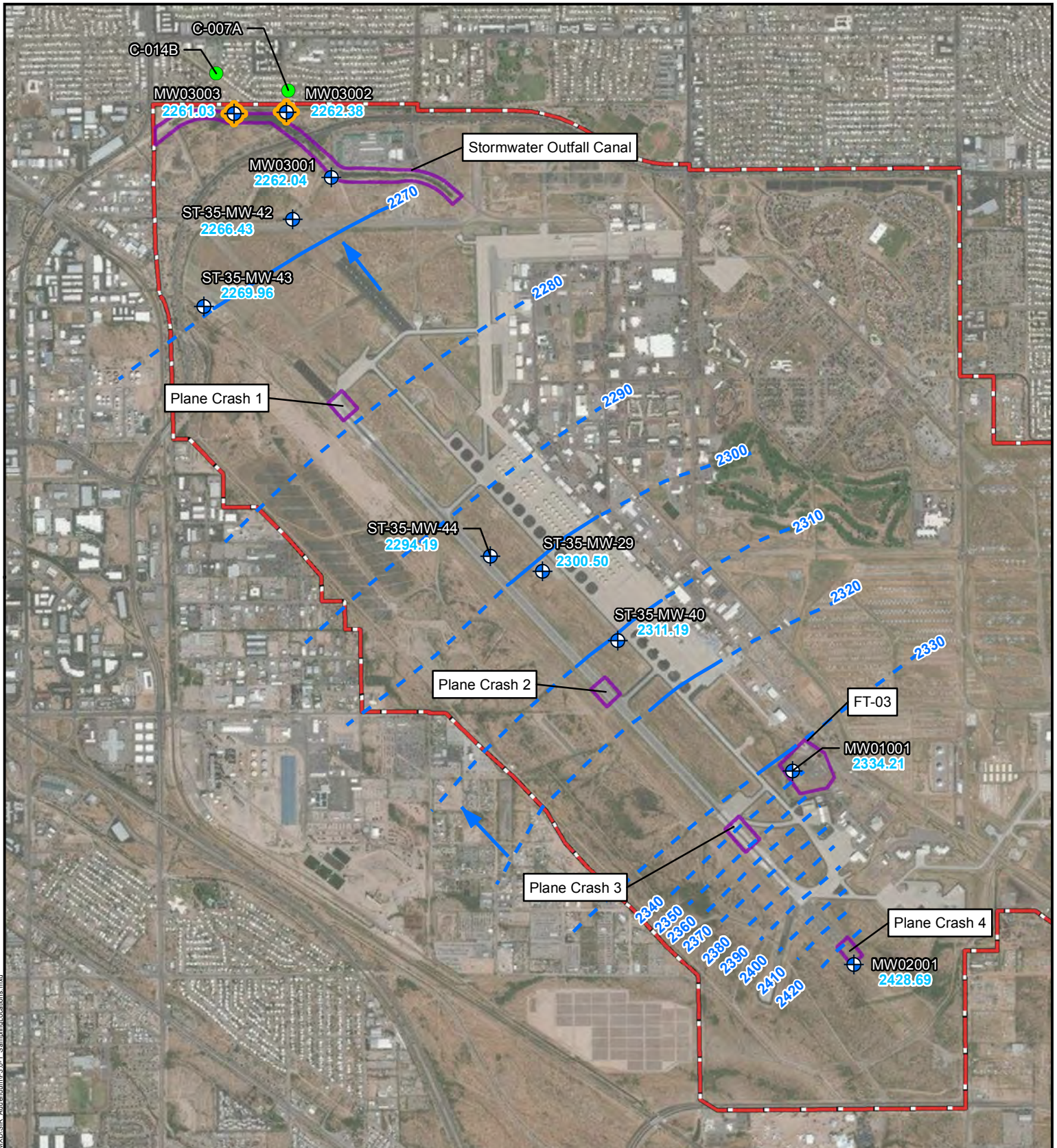


Disclaimer: For general reference purposes only.
 This is not a survey product.
 DO NOT USE to determine, certify, or verify
 map features, scale and/or other information.

Copyright: © 2013 National Geographic
 Society, i-cubed
 Esri, HERE, Garmin, © OpenStreetMap
 contributors, and the GIS user community

Site Inspection of
Aqueous Film Forming Foam (AFFF)
Release Areas
Environmental Programs Worldwide
Site Inspection Report Addendum 01

Path: \\kva-fs1-prod\GIS\775303101_AFCCEC_PFC\Davis-Monthan\MXD\SR_Addendum\F1.01_DM_Installation_Location.mxd



Air Force Civil Engineer Center
 2261 Hughes Ave., Suite 163
 JBSA Lackland, Texas 78236

Project: 775303101
 By: EMK Date: 5/30/2019

0 1,300 2,600 Feet

Symbol Key

- Production Well
- ⊕ New Monitoring Well (Sampled)
- ⊕ Existing Monitoring Well (Gauged Only)
- 2334.21 April 2019 Groundwater Elevations (ft amsl)
- April 2019 Groundwater Contour (Dashed is Inferred)
- ➔ Approximate Groundwater Flow Direction
- AFFF Release Area
- ⬡ Davis-Monthan AFB Installation Boundary

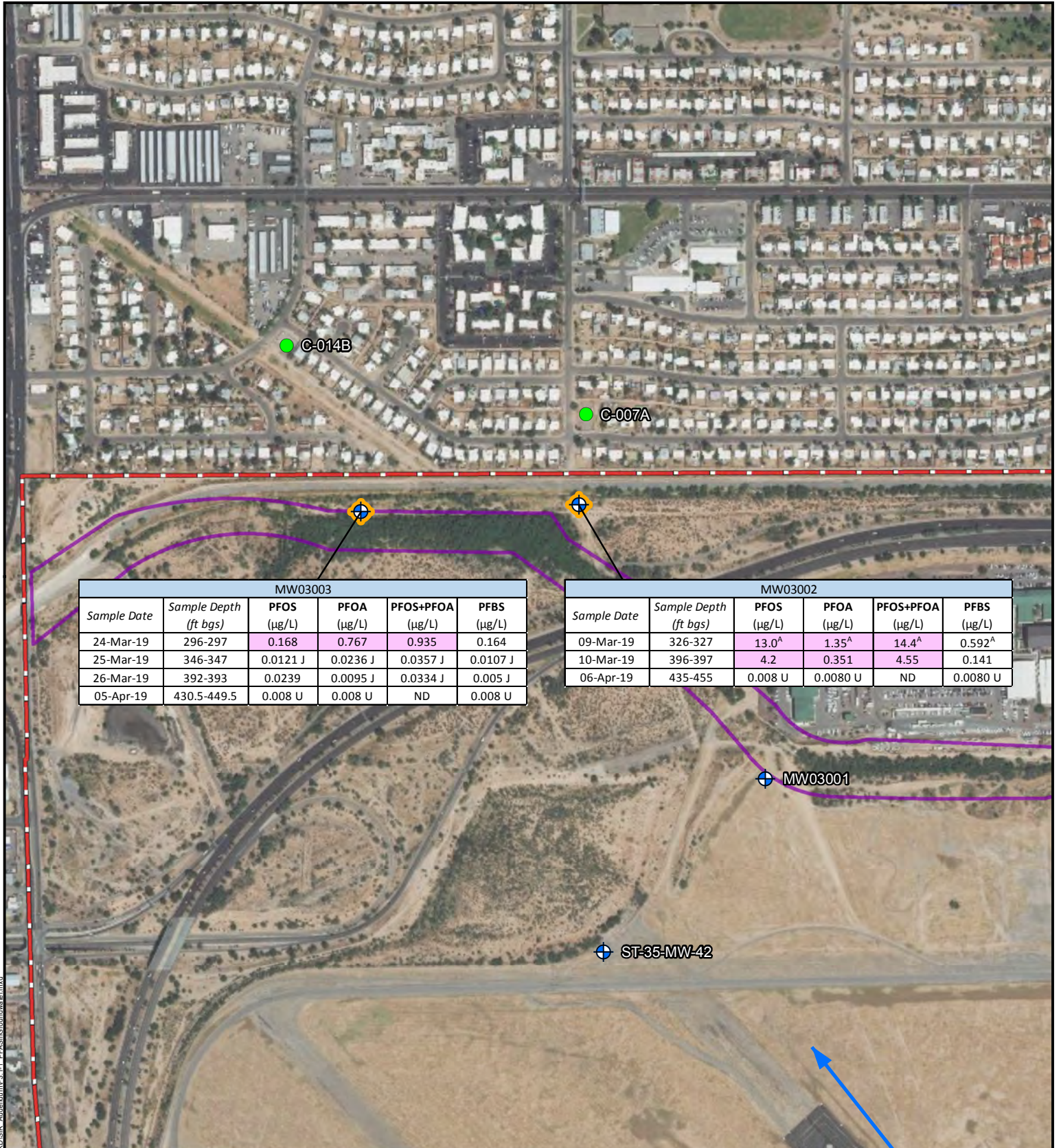
Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

FIGURE 3.0-1
Sampling Locations and
Groundwater Elevations
Davis-Monthan Air Force Base
Tucson, Arizona

Site Inspection of
Aqueous Film Forming Foam (AFFF)
Release Areas
Environmental Programs Worldwide
Site Inspection Report Addendum 01

Path: \\work-fs1\proj\GIS\775303101_AFFE_C_PFCDavis_Monthan\0303101_SIR_Addendum01\p-1_SamplingLocations.mxd



MW03003					
Sample Date	Sample Depth (ft bgs)	PFOS (µg/L)	PFOA (µg/L)	PFOS+PFOA (µg/L)	PFBS (µg/L)
24-Mar-19	296-297	0.168	0.767	0.935	0.164
25-Mar-19	346-347	0.0121 J	0.0236 J	0.0357 J	0.0107 J
26-Mar-19	392-393	0.0239	0.0095 J	0.0334 J	0.005 J
05-Apr-19	430.5-449.5	0.008 U	0.008 U	ND	0.008 U

MW03002					
Sample Date	Sample Depth (ft bgs)	PFOS (µg/L)	PFOA (µg/L)	PFOS+PFOA (µg/L)	PFBS (µg/L)
09-Mar-19	326-327	13.0 ^A	1.35 ^A	14.4 ^A	0.592 ^A
10-Mar-19	396-397	4.2	0.351	4.55	0.141
06-Apr-19	435-455	0.008 U	0.0080 U	ND	0.0080 U

Air Force Civil Engineer Center

 2261 Hughes Ave., Suite 163
 JBSA Lackland, Texas 78236

Symbol Key






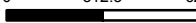
- Production Well
-  New Monitoring Well (Sampled)
-  Existing Monitoring Well
-  Approximate Groundwater Flow Direction
-  AFFF Release Area
-  Davis-Monthan AFB Installation Boundary

FIGURE 3.1-1
PFAS in Groundwater
Davis-Monthan Air Force Base
Tucson, Arizona

Project: 775303101
 By: EMK Date: 5/30/2019

0 312.5 625 Feet



Disclaimer: For general reference purposes only. This is not a survey product. DO NOT USE to determine, certify, or verify map features, scale and/or other information.

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Site Inspection of
Aqueous Film Forming Foam (AFFF)
Release Areas
Environmental Programs Worldwide
Site Inspection Report Addendum 01

This page intentionally left blank.

(b) (6)

Figure 3.2-1 4-Mile Well Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

This page intentionally left blank.

TABLES

This page intentionally left blank.

Table 3.0-1
Monitoring Well Construction Details
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Site Inspection Report, Davis-Monthan AFB, Tucson, Arizona

AFFF Release Area	Location ID	Installation Date	Well Material	Northing	Easting	Ground Elevation (ft amsl)	TOC Elevation (ft amsl)	Well Depth (ft bgs)	Well Diameter (in)	Screen Length (ft)	Screen Size (in)	Screen Interval (ft bgs)
1	MW01001	10/27/2017	PVC	423431.3773	1024222.800	2685.803	2686.07	369.0	4.0	20	0.02	349-369
2	MW02001	12/22/2017	PVC	419608.1853	1025438.002	2711.604	2711.44	305.0	4.0	20	0.02	285-305
	ST-35-MW-40	2/28/2006	PVC	426001.280	1020773.120	NA	2651.21	378.0	5.5	50	0.02	330-380
	ST-35-MW-42	7/21/2006	PVC	434316.240	1014359.334	2564.027	2563.9	380.0	5.5	50	0.02	318-368
	ST-35-MW-43	7/18/2006	PVC	432592.120	1012610.870	NA	2561.74	380.0	5.5	50	0.02	318-368
	ST-35-MW-44	9/29/2007	PVC	427674.487	1018266.420	NA	2624.73	380.0	5.5	50	0.02	318-368
3	MW03001	10/16/2017	PVC	435136.306	1015126.852	2565.485	2565.37	321.0	4.00	20	0.02	301-321
	MW03002	3/11/2019	PVC	436436.02	1014244.521	2548.833	2551.88	457.0	4.00	20	0.02	435-455
	MW03003	3/21/2019	PVC	436402.689	1013212.234	2544.554	2547.33	462.0	4.00	20	0.02	430-450

Notes:

AFFF - aqueous film forming foam
amsl - above mean sea level
bgs - below ground surface
ft - feet
in - inches
NA - not available
PVC - Polyvinyl Chloride
TOC - top of casing

This page intentionally left blank.

**Table 3.0-2
Groundwater Elevations
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Site Inspection Report, Davis Monthan AFB, Tucson, Arizona**

AFFF Release Area	Location ID	Well Depth (ft bgs)	Ground Surface Elevation (ft amsl)	TOC Elevation (ft amsl)	Date Measured	Depth to Groundwater (ft btoc)	Groundwater Elevation (ft amsl)
1	MW01001	369.0	2685.803	2686.068	1/29/2018	350.49	2335.58
					4/2/2019	351.86	2334.21
2	MW02001	305.0	2711.604	2711.435	1/29/2018	282.49	2428.95
					4/2/2019	282.75	2428.69
	ST-35-MW-29	375.0	NA	2632.69	1/29/2018	330.05	2381.39
					4/2/2019	332.19	2300.50
	ST-35-MW-40	378.0	NA	2651.21	1/29/2018	338.07	2313.14
					4/2/2019	340.02	2311.19
	ST-35-MW-42	380.0	2564.027	2564.88	1/29/2018	300.20	2264.68
					4/2/2019	298.45	2266.43
	ST-35-MW-43	380.0	NA	2561.74	1/29/2018	293.81	2267.93
					4/2/2019	291.78	2269.96
	ST-35-MW-44	380.0	NA	2624.73	1/29/2018	328.14	2296.59
					4/2/2019	330.54	2294.19
3	MW03001	321.0	2565.485	2565.369	1/29/2018	302.34	2263.03
					4/2/2019	303.33	2262.04
	MW03002	457.0	2548.833	2551.876	4/2/2019	289.50	2262.38
	MW03003	462.0	2544.554	2547.331	4/2/2019	286.30	2261.03

Notes:

AFFF - aqueous film forming foam
amsl - above mean sea level
bgs - below ground surface
btoc - below top of casing
ID - Identification
ft - feet
NA - not available
TOC - top of casing

This page intentionally left blank.

Table 3.1-1
Summary of Groundwater Analytical Testing Results
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Site Inspection Report, Davis-Monthan Air Force Base, Arizona

Analyte:						Perfluorooctanesulfonic acid (PFOS)	Perfluorooctanoic acid (PFOA)	PFOS+PFOA	Perfluorobutanesulfonic acid (PFBS)	6:2 Fluorotelomer sulfonate (6:2 FTS)	8:2 Fluorotelomer sulfonate (8:2 FTS)	N-Ethyl perfluorooctanesulfonamidoacetic acid (NETFOSAA)	N-Methyl perfluorooctanesulfonamidoacetic acid (NMEFOSAA)	Perfluorodecanoic acid (PFDA)	Perfluorododecanoic acid (PFDoA)	Perfluorohexanoic acid (PFHpA)	Perfluorohexanesulfonic acid (PFHxS)	Perfluorohexanoic acid (PFHxA)	Perfluorononanoic acid (PFNA)	Perfluorotetradecanoic acid (PFTeDA)	Perfluorotridecanoic acid (PFTrDA)	Perfluoroundecanoic acid (PFUnA)	
Health Advisory:						0.07	0.07	0.07	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
EPA RSL Tapwater ¹ :						NA	NA	NA	40	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
AFFF Area	Location	Sample ID	Sample Date	Sample Depth (ft.)	Sample Type	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
3	MW03002	DAVIS03-GW-002	09-Mar-19	326.0-327.0	N	12.2	1.21	13.4	0.522	6.22	0.17 U	0.17 U	0.17 U	0.042 U	0.042 U	0.752	3.96	2.15	0.0254 J	0.042 U	0.042 U	0.042 U	
		DAVIS-FD-GW-002	09-Mar-19	326.0-327.0	FD	13	1.35	14.4	0.592	6.71	0.2 U	0.2 U	0.2 U	0.05 U	0.05 U	0.821	4.38	2.31	0.0286 J	0.05 U	0.05 U	0.05 U	
		DAVIS03-GW-003	10-Mar-19	396.0-397.0	N	4.2	0.351	4.55	0.141	1.53	0.07 U	0.07 U	0.07 U	0.017 U	0.017 U	0.2	1.18	0.525	0.0092 J	0.017 U	0.017 U	0.017 U	
		DAVIS03-GW-008	06-Apr-19	435.0-455.0	N	0.008 U	0.008 U	ND	0.008 U	0.032 U	0.032 U	0.032 U	0.032 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U
	MW03003	DAVIS03-GW-004	24-Mar-19	296.0-297.0	N	0.168	0.767	0.935	0.164	0.792 J	0.033 UJ	0.033 UJ	0.033 UJ	0.0083 UJ	0.0083 UJ	0.519	0.854 J	0.726	0.0287 J	0.0083 UJ	0.0083 UJ	0.0083 UJ	0.0083 UJ
		DAVIS03-GW-005	25-Mar-19	346.0-347.0	N	0.0121 J	0.0236 J	0.0357 J	0.0107 J	0.0347 J	0.05 U	0.04 U	0.04 U	0.013 U	0.013 U	0.0171 J	0.0504	0.0473	0.013 U	0.013 U	0.013 U	0.013 U	
		DAVIS03-GW-006	26-Mar-19	392.0-393.0	N	0.0239	0.0095 J	0.0334 J	0.005 J	0.033 U	0.033 U	0.033 U	0.033 U	0.0083 U	0.0083 U	0.0054 J	0.0221	0.0179	0.0083 U	0.0083 U	0.0083 U	0.0083 U	
		DAVIS03-GW-007	05-Apr-19	430.5-449.5	N	0.008 U	0.008 U	ND	0.008 U	0.032 U	0.032 U	0.032 U	0.032 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	0.008 U	

Notes:

Purple Shaded = Exceeds Health Advisory

Underlined results exceed the EPA RSL standard.

FD = Field Duplicate Sample

ft = Feet

ID = Identification

J = The analyte was positively identified and the associated numerical value is the approximate concentration of the analyte in the sample.

N = Normal Field Sample

NA = Not applicable

U = The analyte was analyzed for, but was not detected above the reported limit of detection (LOD).

UJ = The reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

µg/L = micrograms per liter

PFAS analysis by Modified USEPA Method 537 using Liquid Chromatography and Tandem Mass Spectrometry

Health Advisory from USEPA Office of Water, 2016a and 2016b, Health Advisories (HAs) for drinking water.

¹USEPA Regional Screening Levels (November, 2017a) [https://semsub.epa.gov/work/HQ/197027.pdf]

This page intentionally left blank.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Table 3.2-1 4-Mile Well Reconnaissance Survey provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

TABLE 4.0-1
Conceptual Site Model: Installation Wide Summary
Site Inspection Report of Aqueous Film Forming Foam (AFFF) Release Areas
Follow-on Addendum 1 Site Inspection Report, Davis Monthan Air Force Base, Tucson, Arizona

Facility Profile	Physical Profile	Release Profile	Land Use and Exposure Profile	Ecological Profile
<p>Installation Description/History:</p> <ul style="list-style-type: none"> Years of operation: 1925 to Current (HGL, 2015). Size: Approximately 11,000 acres (URS, 2011). Location: Davis Monthan AFB is located within the city limits of Tucson, Pima County, Arizona (Innovative Technical Solutions, Inc., 2010). History: Davis Monthan AFB was established as Tucson Landing Field in 1925. The Strategic Air Command stationed two B-29 bombardment groups at DMAFB in 1946. The facility was transferred to the Tactical Air Command in 1976 (URS, 2011). Current Mission: The Wing's missions are to train A-10 and OA-10 pilots and to provide support and forward air control to ground forces worldwide. The 355th Wing also provides command, control, and communications countermeasures in support of tactical forces with the EC-130H aircraft (URS, 2011). <p>AFFF Use:</p> <ul style="list-style-type: none"> AFFF containing PFAS was used for firefighting training activities and in extinguishing fires caused by aircraft accidents. Three AFFF release areas were investigated during the SI: <ul style="list-style-type: none"> FT-03 (Former FTA) Plane Crash Locations 1 - 4 Stormwater Outfall Canal 	<p>Topography:</p> <ul style="list-style-type: none"> The topography of Davis Monthan AFB is relatively flat, gradually sloping downward to the north and northwest (URS, 2011). <p>Vegetation:</p> <ul style="list-style-type: none"> The vegetation in undeveloped areas consists of grasses, cactus, and scrub indigenous to desert. Scrub species include the creosote bush, bursage, and palo verde, while cactus species primary is represented by saguaro, barrel, prickly pear, and cholla (Innovative Technical Solutions, Inc., 2010). In the more developed portions of the base, the vegetation is largely imported nonnative flora, which are artificially irrigated (Innovative Technical Solutions, Inc. 2010). <p>Surface Water: (URS, 2011).</p> <ul style="list-style-type: none"> The Surface drainage over most of the installation is collected by a system of swales and dry washes and is routed to the Stormwater Outfall Canal then to the Tucson Diversion Channel, which is classified as a tributary of the Santa Cruz River. A system of subsurface storm drainage pipes collects runoff along the flightline and main runway. The drainage pipes also route the runoff to the Stormwater Outfall Canal. Davis Monthan AFB also uses numerous catch basins and containment ponds to control stormwater runoff and prevent spills from leaving the installation. Groundwater is recharged at the basin periphery and by streambed infiltration along the Santa Cruz River and its tributaries. The surface drainage over most of the installation is collected by a system of swales and dry washes and is routed to the Stormwater Outfall Canal then to the Tucson Diversion Channel, which is classified as a tributary of the Santa Cruz River. <p>Soils:</p> <ul style="list-style-type: none"> Surface features at Davis Monthan AFB are composed of Mohave soils and Hantz loam. These soil types create a typical soil profile at the installation consisting of clay and sandy loam, with a high percent of calcium carbonate, or caliche (URS, 2011). <p>Geology: (URS, 2011).</p> <ul style="list-style-type: none"> The block-faulted mountains surrounding the Tucson Basin are composed of Precambrian through Tertiary age granitic, metamorphic, volcanic, and consolidated sedimentary rock. In ascending order, the lower basin-fill unit has been divided into the Pantano Formation and the lower and middle Tinaja beds, and the upper basin fill unit has been divided into the upper Tinaja beds, Fort Lowell Formation, and surficial alluvial deposits, which include stream channel deposits. <p>Hydrogeology: (HGL, 2015) (James M. Montgomery, 1990)</p> <ul style="list-style-type: none"> The Pantano Formation is the lowest unit into which wells have been installed in the vicinity of Davis Monthan AFB. The top of this formation occurs at approximately 1,300 feet above mean sea level (amsl) (1,400 feet below ground surface [bgs]). The Tinaja beds occurs at approximately 2,400 feet amsl (approximately 300 feet bgs). Most of the wells installed at Davis Monthan AFB are completed into the Tinaja Beds. The Fort Lowell Formation overlies the Tinaja beds and consists of gravel near the edge of the basin, grading to silt in the center. The Fort Lowell Formation occurs from approximately 2,220 feet to 2,500 feet amsl. The formations, which comprise the aquifer of the Tucson Basin, generally act, more or less, as a single hydrologic unit. Groundwater enters the Tucson Basin from the south and east through the narrow gap between the Rincon and Santa Rita Mountains near Vail, Arizona. Groundwater exits the basin to the northwest through the Rillito Narrows between the Tucson and the Tortolita Mountains. Aquifer transmissivities in the Tucson Basin range from 1,000 to almost 500,000 gallons per day per foot. Groundwater flow direction is generally toward the north and northwest, with groundwater elevations ranging from 2428.69 to 2261.03 feet above mean sea level. Water levels beneath Davis Monthan AFB are approximately 250 to 350 feet bgs. 	<p>Contaminants of Potential Concern:</p> <ul style="list-style-type: none"> PFAS are the contaminants of potential concern during this investigation. Volatile organic compounds (VOCs), specifically tetrachloroethene (PCE) and trichloroethene (TCE) and petroleum hydrocarbons are historical site contaminants. <p>Media of Potential Concern:</p> <ul style="list-style-type: none"> Soil, sediment, and groundwater. <p>Confirmed AFFF Releases:</p> <ul style="list-style-type: none"> FT-03 (Former FTA): PFOS and PFOA were detected in surface soil above the USEPA RSLs. PFOS in sediment was also detected above the USEPA RSL. PFOS and PFOA were detected in surface soil at concentrations exceeding the calculated RSLs based on a residential exposure scenario at AFFF Release Area 1. PFOS was detected in sediment at a concentration exceeding the calculated RSL based on a residential exposure scenario at AFFF Release Area 1 during the initial SI. PFOS and PFOA were detected in exceedance of the USEPA HA values at groundwater interface and concentrations decreased with depth at AFFF Release Area 3, during follow-on investigation activities. <p>Primary Release Pathways:</p> <ul style="list-style-type: none"> Release or application of AFFF to the ground at source areas. Infiltration of PFAS deeper into soil column over time reaching groundwater. Surface and storm water infiltration into groundwater. 	<p>Current Land Use:</p> <ul style="list-style-type: none"> Occupied by Davis-Monthan AFB. <p>Future Land Use:</p> <ul style="list-style-type: none"> Land use is not expected to change in the future. <p>Potential Receptors: (HGL, 2015)</p> <ul style="list-style-type: none"> Potential receptors associated with current and future land use include USAF personnel and residents, grounds maintenance workers, utility workers, and construction workers. Potential receptors associated with current land use include downgradient drinking water wells. 	<p>Potential Ecological Receptors: (HGL, 2015).</p> <ul style="list-style-type: none"> There are no sensitive environments or wetlands located within the installation boundary <p>Threatened and Endangered Species: (HGL, 2015) (United States Fish and Wildlife)</p> <ul style="list-style-type: none"> Amphibians: Chiricahua Leopard Frog. Birds: Mexican Spotted Owl, Masked bobwhite quail, American peregrine falcon, California least tern, Yellow-billed Cuckoo, Cactus Ferruginous Pygmy-Owl, Masked Bobwhite, Mountain Plover, Bald Eagle, Southwestern Willow Flycatcher. Fish: Desert Pupfish, Gila (Yaqui) Topminnow, Sonora Chub and Gila chub. Mammals: Sonoran Pronghorn, Lesser Long-Nosed Bat, Jaguar, and Ocelot. Reptiles: Northern Mexican gartersnake and Sonoyta mud turtle. Snails: Sonoran talussnail Plants: Nichol's Turk's Head Cactus, Huachuca Water Umbel, Kearney's Blue-Star, Pima Pineapple Cactus, Acuna Cactus, Bartam stonecrop, Beardless chinch weed, and Canelo Hills ladies'-tresses.

TABLE 4.0-1
Conceptual Site Model: Installation Wide Summary
Site Inspection Report of Aqueous Film Forming Foam (AFFF) Release Areas
Follow-on Addendum 1 Site Inspection Report, Davis Monthan Air Force Base, Tucson, Arizona

Facility Profile	Physical Profile	Release Profile	Land Use and Exposure Profile	Ecological Profile
	<p>Meteorology: (URS, 2011).</p> <ul style="list-style-type: none"> • A low precipitation rate (10 in per year) and a high evaporation rate (65 in per year) are common to the Davis Monthan AFB area. • The annual average temperature is approximately 68 degrees Fahrenheit (°F), with average daily maximum temperature of 81 °F, respectively. The hot season extends from April through October, with an average of 41 days annually with maximum temperatures over 100°F. 	<p>Secondary Release Pathways:</p> <ul style="list-style-type: none"> • AFFF washed into drainage, stormwater, and sewer systems. 		

Notes:
AFFF – aqueous film forming foam
AFB – Air Force Base
FTA – fire training area
HA – Health Advisory
PFAS – per- and polyfluorinated alkyl substances
PFBS - Perfluorobutanesulfonic acid

PFOA - perfluorooctanoic acid
PFOS - perfluorooctane sulfonic acid
RSL – Regional Screening Level
SI – Site Inspection

Appendix A
Photograph Log

Appendix B
Field Forms



27 February 2019

Photo 1:
AFFF Release Area 3 -
MW03002 drilling
location prior to site
grubbing.

Direction of Photo:
Northeast



27 February 2019

Photo 2:
AFFF Release Area 3 -
Tucson Water Main
marked near MW03002
drilling location.

Direction of Photo:
North



27 February 2019

Photo 3:
AFFF Release Area 3 –
Access road to
MW03003 prior to site
grubbing.

Direction of Photo:
Southeast



27 February 2019

Photo 4:
AFFF Release Area -
MW03003 drilling
location prior to site
grubbing.

Direction of Photo:
Northwest



1 March 2019

Photo 5:
AFFF Release Area 3 –
MW03003 drilling area
post site grubbing.

Direction of Photo:
Northwest



1 March 2019

Photo 6:
AFFF Release Area -
Delivery of 1st of 4 roll
off bins in staging area.

Direction of Photo:
Northwest



1 March 2019

Photo 7:
AFFF Release Area 3 –
Secondary containment
set-up for Liquid IDW
poly tank in staging
area.

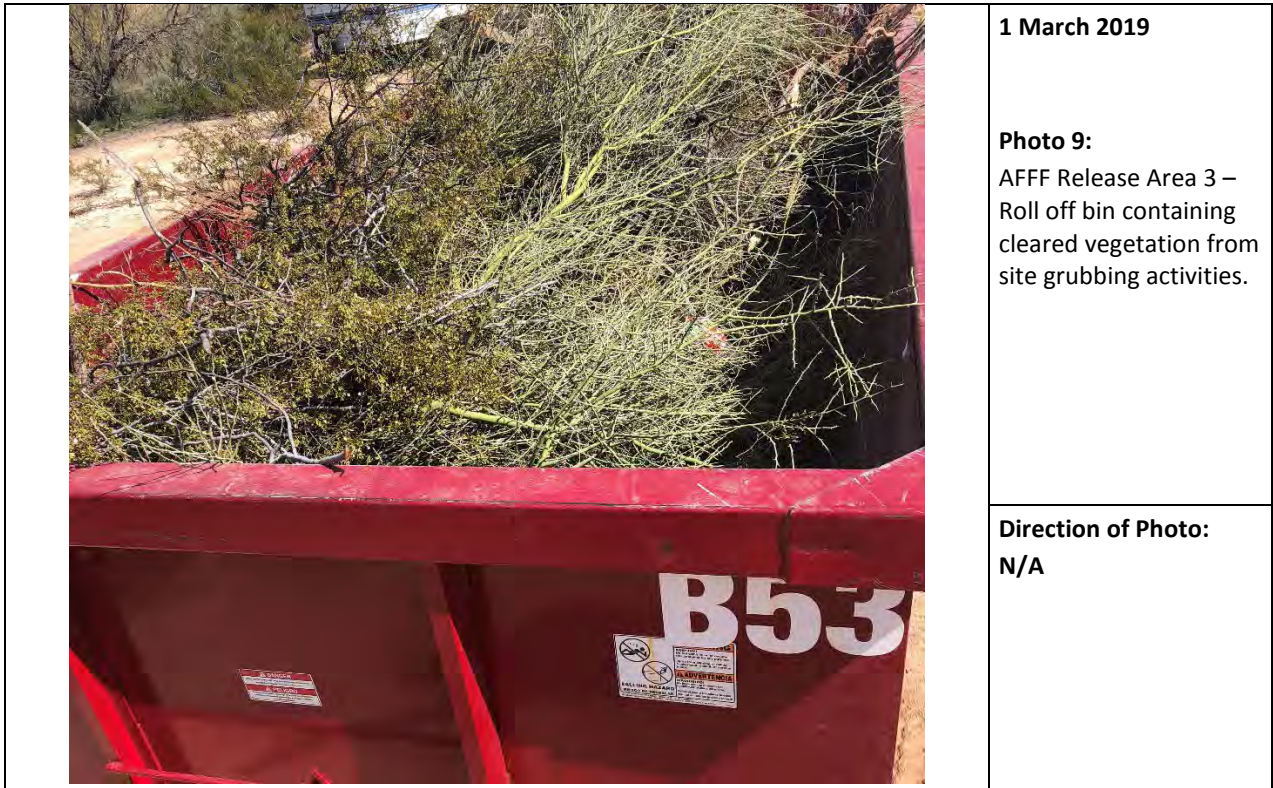
Direction of Photo:
Northwest



1 March 2019

Photo 8:
AFFF Release Area 3 –
Liquid IDW poly tank
with secondary
containment in staging
area.

Direction of Photo:
East





22 December 2017

Photo 11:
AFFF Release Area 3 –
Schedule-80 4”-
diameter PVC riser for
well construction.

Direction of Photo:
N/A



4 March 2019

Photo 12:
AFFF Release Area 3 –
Brand new 7”-diameter
core barrel drive shoe.

Direction of Photo:
N/A



7 March 2019

Photo 13:
AFFF Release Area 3 –
Four stage
decontamination
buckets labeled and
stored in IDW storage
area with secondary
containment.

Direction of Photo:
N/A



7 March 2019

Photo 12:
AFFF Release Area 3 –
Collection of Equipment
blank from Hydropunch
screen using lab-
certified PFAS free DI
water post four stage
decon process.

Direction of Photo:
N/A



8 March 2019

Photo 13:
AFFF Release Area 3 –
Hydropunch with
screen exposed to show
sampling mechanism
before being tripped
down to sample depth.

Direction of Photo:
N/A



29 January 2018

Photo 14:
AFFF Release Area 3 –
Well screen installation
at MW03002.

Direction of Photo:
N/A



13 March 2019

Photo 15:
AFFF Release Area 3 –
Decontamination of
well swab and bailer for
swabbing screen and
settling filter pack.

Direction of Photo:
N/A



13 March 2019

Photo 16:
AFFF Release Area 3 –
Adding time-released
bentonite chips after
swabbing and bailing
well screen.

Direction of Photo:
N/A



21 March 2019

Photo 17:
AFFF Release Area 3 –
Decontamination of drill
platform over decon
pad.

Direction of Photo:
N/A




20 March 2019

Photo 18:
AFFF Release Area 3 –
Surface completion
process of MW03002.

Direction of Photo:
N/A

	<p>20 March 2019</p> <p>Photo 19: AFFF Release Area 3 – Concrete pad and protective casing installed at MW03002.</p> <hr/> <p>Direction of Photo: N/A</p>
---	--

	<p>3 April 2019</p> <p>Photo 20: AFFF Release Area 3- Decontamination of surge block, bailer, 1” steel pipe, and sounding tube to prepare for well development at MW03002.</p> <hr/> <p>Direction of Photo: N/A</p>
--	--

 <p> GRUNDFOS Grundfos Holding A/S DK - 8850 Bjerringbro Denmark PROD.NO. 96160181 MODEL B/E P2 1722 5 SQE-450 PUMP UNIT 96397409 NPT 1 Stages: Q: 5 GPM H: 449 f R: 200-240 V 50/60 Hz 11 A P1: 2.19 P2 motor: 1/2 HP CONT. DUTY 30 °F Weight 14.8 MADE IN MEXICO Sustainable Deep-Well 1722 </p>	<p>3 April 2019</p> <p>Photo 21: AFFF Release Area 3 – Grundfos pump specifications.</p>
	<p>Direction of Photo: N/A</p>

	<p>5 April 2019</p> <p>Photo 22: AFFF Release Area 3 – Decontamination of Grundfos pump before placement in MW03003.</p>
	<p>Direction of Photo: N/A</p>



6 April 2019

Photo 23:
 AFFF Release Area 3 –
 Roll off bins all labeled
 pending analysis with
 contents and contact
 information.

Direction of Photo:
 N/A



6 April 2019

Photo 24:
 AFFF Release Area 3 –
 Liquid IDW poly tank
 with ladder removed,
 lid secured, and labeled
 pending analysis with
 contents and contact
 information.

Direction of Photo:
 N/A







6 April 2019

Photo 29:
Liquid IDW poly tank
ladder secured to roll
off bin with padlock and
heavy duty chain.

Direction of Photo:
N/A

APPENDIX A-1

Well Reconnaissance Survey

This page intentionally left blank.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

(b) (6)

Appendix A-1 provides information about the type and location of off-base private sampling sources. It contains personal privacy information that is not publicly releasable under the Freedom of Information Act, 5 U.S.C. § 552, and is maintained in a separate portion of the Administrative Record that is not accessible to the public.

This page intentionally left blank.

Appendix B-1
Field Activity Daily Logs

This page intentionally left blank.

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Cloudy, 60s	Date and Time:	02/27/19 16:52
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:45	L. Baader on site.
07:00	Bell from Tucson Transportation and K. Keegan on site. HASP reviewed. Checked entrances and discussed permit details, timing, and signage for bike path to prevent collisions.
07:45	Southwest gas onsite to check on ticket renewal. Still clear.
08:16	Southwest gas off site.
09:03	Yellow Jacket Drilling (YJD) and trafficade onsite. Lane closed to allow safe passage for roll off delivery.
09:30	Roll off bin #. delivered on site. Site walk with YJD to go over plants that should remain untouched (white flags in photos) and boundaries for clearing.
10:30	YJD off site to fill water tank for dust control.
11:00	Meter on hydrant inoperable. YJD contacted city to coordinate repairs to get water connection coordinated.
11:30	Break for lunch
12:00	Return from lunch; awaiting arrival of backhoe from PHX scheduled to arrive between 12-12:30
13:15	L. Baader contacted M. Camba (Wood, biologist) to confirm authorization to remove prickly pear cacti that had clippings taken at west side of site. M. Camba confirmed authorization. Begin grubbing at west side of site.
15:40	West side of site partially cleared. Debris piles prepped for removal.
16:20	Tools secured and equipment locked. L. Baader & YJD off site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Bell Mong, Tucson Transportation Inspector.	Technician Name (print): Lauren Baader
Important Telephone Calls / Photos Taken:	None	

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/14/2019
--------------------	------------------	--	--------------------	-----------



SUMMARY OF DAILY ACTIVITIES

Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027	Task Order: 0004
Installation: DAVIS - Davis-Monthan AFB	Investigation Area: AFFF Area 3
Weather: Sunny, 75°F	Date and Time: 02/28/19 17:04
Technician(s): Lauren Baader, Kyle Keegan	

Description of Daily Activities and Events:	
<u>Time</u>	<u>Observation/Comment</u>
07:00	Site safety meeting, L. Baader, K. Keegan and YJD on site.
07:15	Begin cutting/clearing east side of site; loading debris into roll off container
09:30	Water connection repaired by city; YJD offsite to fill water truck
11:30	Break for lunch
13:30	Return from lunch; continue trimming branches and clearing east side of site. Port-o-John delivered on site.
13:41	Water sprayed on for dust control, continue site clearing activities, and final grading
17:00	Grubbing activities complete. Site graded, sprayed, cleared and prepared for drilling. L. Baader, k. Keegan and YJD off site.

List of Samples Collected: NA	Technician Signature:
Deviation from Plans: None	
Visitors on Site: None	
Important Telephone Calls / Photos Taken: None	Technician Name (print): Lauren Baader

QA/QC'd by: Thomas W. Hensel		QA/QC Date:	3/14/2019
-------------------------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70s	Date and Time:	03/01/19 14:02
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:	
<u>Time</u>	<u>Observation/Comment</u>
08:49	Safety tailgate meeting; YJD & L. Baader on site.
09:23	YJD mob off site. Roll off bin # B53 full with plant debris. Water truck left on site.
09:26	Phone call with John from DNT; poly tank 45 minutes out.
10:25	6500 gal poly tank delivered on site. Secondary containment placed under tank. L. Baader contacted L. Simmons about tank capacity discrepancy and scheduled delivery of second tank to cancel second tank.
11:33	4 20-yard locking (hard top) roll off bins delivered on site and placed along perimeter of cleared area near MW03002. Bin #s: 5475 (east of access road), then from south to north on west side of access road, #5430, #6577, #6253
12:43	L. Baader remaining on site pending pick up of vegetation roll off bin and excavator by YJD.
13:31	Vegetation roll off bin picked up and hauled off site.
13:58	L. Baader off site. Security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	6500 gal tank delivered instead of 4000 gal poly tank.	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	Photos of tanks, roll off bins, site after grubbing. L. Baader contacted L. Simmons in regards to sorting out polytank misunderstanding (delivery of second tank on Monday cancelled)	Technician Name (print): Lauren Baader
QA/QC'd by:	Thomas W. Hensel	QA/QC Date: 3/14/2019

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 75°F	Date and Time:	03/04/19 10:09
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
08:45	L. Simmons, L. Baader, K. Keegan, Dennis Heyer from AGEISS on site. L. Simmons discussed changes to QPP and ISWPA. Discussed chain of communication to facilitate removal of trash on site non-project related. (bike path)
10:20	L. Baader & L. Simmons reviewed/ signed HASP, tailgate safety meeting with drillers on site. Discussed hazards with loading/unloading equipment, materials, and piping. L. Simmons covered changes to work plan to accommodate new drilling depths and screening intervals. Roll off bins labeled as empty, (non-haz; ordered pending analysis)
	Inventory of equipment and piping. Tooling: 2x 10' 12" casing 1x 5' 12" casing 50x 10' 8.25" casing 57x 10' 3.5" Sonic rods 20x 10' 9" casing 2x 10' 7" core barrel Materials: 2x 20' conductor casing 1.5 12/20 Silica sand 1 pallet Portland cement 1 pallet quikgel bentonite Poly sheeting 6 buckets bentonite chips 1/4 pallet concrete 88' 4" pvc 8x bollards 2x protective casing Security on site 5pm-7pm
11:47	
12:05	Begin clearing MW03002 with hand auger to 5 ft bgs
12:41	MW03002 cleared to 5 ft bgs and 12" diameter
13:42	Break for lunch
14:20	Rig staged with secondary containment (plastic sheeting underneath)
15:46	Safety perimeter set up around drilling area
15:51	Will advance 20 feet of 12"
16:01	PID calibrated using 100ppm isobutylene lot #4834501 serial number 592-917171
16:13	See boring log MW03002
16:41	Place soil for IDW characterizations in 5-gallon bucket.
17:49	Drilled to 36 feet with 7" core barrel, advanced 12" casing to 16' end drilling for day.
18:30	All Wood and YJD personnel off site. Security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Dennis Heyer	Technician Name (print): Lauren Baader
Important Telephone Calls / Photos Taken:	See photo log	

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/14/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	03/05/19 13:37
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader and K. Keegan on site
06:40	YJD on site. Safety tailgate meeting held. PFAS sampling protocol reviewed.
07:20	Continue pushing 12" casing from 16' bgs, core samples from 36' bgs.
09:30	L. Simmons off site to gather materials/equipment
10:10	Soil logging continued, PID screening continued.
10:44	Evan Pilling from bike park nonprofit on site: confirmed trash bags are theirs, debris from trash clean up, and will be removed by them from site
10:55	PID calibrated SN: 592-917171; 100ppm isobutylene lot #4834501
13:36	Disposed of IDW from MW03002 into rolloff bin #6253. Other empty rolloff numbers include 6577; 5430; 5475
13:37	2 pallets of cement delivered to site.
13:46	Sandy Elder arrived onsite. TD: 106. Estimated VAS to start Thursday. Suggested water truck to be moved off underground water main/ access pipe. Sandy offsite. Drillers moved water truck off underground water main.
16:29	Load soil into rolloff. Plastic core bags disposed of in separate trash bag.
16:30	Dennis Heyer suggested to stop drilling at 1700 to get offsite around 17:30. Discussed with drillers. Gets dark around 18:00.
16:46	Walked MW03004 location, not grubbed, will be able to clear with bobcat later.
16:47	Rig down for rotation motor.
16:50	12" casing advanced to 20', 9" casing at 116' total drilled with 7" core is at 146'

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Sandy Elder, Evan Pilling	Technician Name (print): Lauren Baader
Important Telephone Calls / Photos Taken:	None	

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/14/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80's	Date and Time:	03/06/19 20:09
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
09:37	L. Baader and L. Simmons meet at hotel to review SOPs and prepare to take field blank samples. PFAS protocol checklist filled out.
09:46	Protocol checklist reviewed, in compliance with PFAS checklist.
13:18	L. Simmons L. Baader Dennis Heyer and YJD on site. Tailgate safety meeting conducted by L. Baader
14:29	Forklift/ hopper used to clear pile of dirt near access road, vegetation removal from MW03004.
15:00	Kyle Keegan on site
16:10	2 brand new motors delivered on site by Rick from YJD. HASP and safety reviewed with Rick who will join us on site tomorrow as well.
18:11	All YJD and Wood personnel off site. Security on site.
	Note: Field Blank sample not collected.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Rich, YJD safety monitor	
Important Telephone Calls / Photos Taken:	None	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel 	QA/QC Date:	3/15/2019
--------------------	----------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Partly cloudy, 70's	Date and Time:	03/07/19 21:44
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	YJD and Wood onsite, site safety meeting
07:00	Rig warm up. Pending analysis labels affixed to empty and partially full roll offs.
08:03	extra meters stored in box truck in protective cases and plastic sheeting; begin drilling.
	PID calibrated
08:04	SN: 592-914351 Lot #: 4834501
09:02	Set up decon buckets #1alconox/water; #2 potable water; #3 potable water; #4 bucket for DI rinse. Took photo.
09:04	Dennis offsite, requested phone call to John Maisch when Tucson Water arrives onsite.
09:04	L. Simmons spoke to Yoke, an SGS courier. She is available to meet at Circle K Gas Station prior to 4:30 on Fridays and 5:00 Mon-Thurs. She will bring some medium sized coolers to replace our large coolers. Requested 1-2 hours call ahead time.
09:18	Drillers requested to use a shrink tubing to fix tag line to measuring tape. L. Simmons emailed Maire Bevier to get PFAS free approval.
09:40	Jerry Helton and Chris with ADEQ onsite. Notified John Maish. Note: 0955 collected DAVIS-FB-001 with PFAS free water batch number 112918
10:06	PFAS protocol checklist completed, field blank collected at 9:55 see grab sample form. John Maisch and on site, extra PPE provided to visitors. Safety tailgate held
10:08	YSI and turbidity meter calibrated, see equipment calibration forms. ADEQ and John Maisch off site
11:20	Note: Hydropunch decontaminated with 5 stage process. #1alconox/water #2 potable water, #3 potable water, #4 DI water, #5 PFAS free water. 11:20 equipment blank from hydro-punch collected DAVIS-EB-031
12:58	Tucson Water onsite, Hector and Chuck onsite. Safety tailgate held.
13:00	At 206 ft - Discussed with the drill crew that we need to wait to check core bags for moisture before going back down for another core. Tristan said they can tell somewhat when they are in wet soil, but the accuracy is low. So we will continue to look for wet soil and signs of moist soil above the water bearing zone.
13:23	Spoke to Sarah Schneider about schedule, Tucson Water requested to get soil samples for sieve analysis every 2-ft to total depth. She will work on getting approval.
13:25	Notified John Maisch about Tucson Water onsite.
13:49	Tucson Water offsite, will be coming back the next couple of days with more people.
14:15	Begin running 8 inch diameter casing from 196 ft bgs. Coring depth reached at end of day = 246' bgs. No moisture observed in cores; water checks will begin tomorrow morning as we approach suspected water table depth. Note: no water encountered, therefore no groundwater sample was collected. Equipment blank taken at 11:20 will not be submitted due to no associated samples.
17:22	

List of Samples Collected:	DAVIS-FB-01	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	John Maisch, Jerry Helton, Chris (ADEQ), Hector and Chuck (Tucson Water)	
Important Telephone Calls / Photos Taken:	Decon Area set up, see photo log	Technician Name (print):
		Lauren Baader


QA/QC'd by:	Thomas W. Hensel 	QA/QC Date:	3/15/2019
--------------------	----------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Cloudy, 70's	Date and Time:	03/08/19 18:41
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader obtained ice for samples double bagged in cooler.
06:45	Site safety meeting held with YJD K Keegan, L. Baader Phone call L. Baader + S. Sargent discussing onsite protocol and behavior
07:00	Continue coring from 246' bgs with water checks/ logging cores PID calibrated SN: 592 914351 Lot # same as previous
07:21	YSI Calibrated SN: 03L0931AB within acceptance criteria Turbidity Meter calibrated SN: 131000028843
10:08	Cody from YJD conducted equipment inspection.
10:51	PFAS protocol form completed. Hydropunch sampler deconned using 4 stage decon method: DAVIS-EB-031 collected, see grab sample form. Equipment blank from yesterday voided but kept on ice. Moisture detected at 275.5 ft bgs; L. Baader instructed drillers to perform short run to check for water (5' run)
11:38	L. Baader called L. Simmons with field ops update. L. Baader contacted Yuko from SGS to coordinate sample pick up for 3:30 at Marriott Courtyard Williams Center
11:52	Break for lunch
12:08	Tucson Water on site (Hector and Max), offsite at 12:15 will return later today when rig is operating. Tailgate safety meeting held. J. Maisch notified of site visitors.
13:34	L. Baader called Yuko to cancel sample drop off due to lack of water presence; likely won't be able to make sample ship time.
14:02	L. Baader spoke to L. Simmons about sample transport; decided to hold samples over weekend on ice replenished every day if any collected today, and ship with samples collected over weekend on Monday.
14:45	Water detected at 295', sounder deconned, WL = 288.85'
16:20	After attempts to obtain groundwater sample at 296' bgs, bailer would not recover adequate water for sample due to fines content. From 295-296 soil is saturated with water and is characterized as clay with sand L. Baader contacted S. Sargent with concerns about turbidity of water sample. S. Sargent suggested drilling 3-5 more feet and trying to obtain sample again. L. Baader advised drillers to drill to 301'. Soil analysis revealed that the water observed at 295 was potentially a perched aquifer - clay observed from 295-300, and then dry clayey sand was observed from 300-301.
17:31	Drillers will continue to push core in small increments, continue water checks and sample will be collected tomorrow morning once actual groundwater table is encountered. L. Baader, K. Keegan and YJD offsite. Security on site.

List of Samples Collected:	None that will be submitted.	Technician Signature: 
Deviation from Plans:	None	
Visitors on Site:	Hector and Max from Tucson Water	
Important Telephone Calls / Photos Taken:	Hydropunch set-up prior to advancement.	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel 	QA/QC Date:	3/15/2019
--------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Investigation of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 50s-60's	Date and Time:	03/09/19 17:50
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:	
<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader replenished ice in sample cooler @ 550. L. Baader, K. Keegan, YJD on site. Safety tailgate meeting held.
07:00	Rig warmed up, site set up, PID calibrated SN: 592-917171 Lot: same as previous
07:20	Continue coring from 301' - water checks for GW table. L. Baader contacted L. Simmons about sounders being too short - 200 ft and 300 ft on site. 500 ft sounders will be shipped to hotel.
08:05	YSI and turbidity meter calibrated. See calibration logs.
08:13	Roll off bin #6253 70% full. Labeled as soil cuttings. Will deposit cuttings from today on in bin #6577 until full, labeled contents as soil cuttings. New IDW soil bucket labeled with date and boring/ bin number. See photos for bin 6253 at capacity.
10:43	316-325 core fell out while tripping out, recovered core and it was mixed sand and saturated, 325-326 dry. Sounder deconned. WL= 289.55'. Will attempt to sample with hydropunch.
11:05	Hydropunch deconned, equipment blank taken: DAVIS-EB-031 at 11:05
11:40	Sample DAVIS03-GW-002 and DAVIS-FD-GW-002 collected using bailer and discrete groundwater sampling device at 326' bgs
16:36	Reached 366' by 1630, next water sample will be taken at 376' so stop drilling for today, will drill to 376' and retrieve water sample in the morning.
17:07	L. Baader, K Keegan and YJD offsite, security on site

List of Samples Collected:	DAVIS-EB-031, DAVIS03-GW-002, DAVIS-FD-GW-002	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	None	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/15/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70's	Date and Time:	03/10/19 21:57
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader K. Keegan and YJD on site.
06:45	Tailgate safety meeting
06:46	PID calibrated SN: 59217171 Lot #: same as previous YSI calibrated SN: 03L0931AB
07:15	Turbidity Meter calibrated SN: 131000028843
09:43	376' bgs reached, hydropunch deconned and equipment blank DAVIS-EB-032 collected at 0800 with lot #112918 PFAS free water. After many attempts to retrieve grab sample, no water was observed in sampling device. Tried to advance sampling device a foot to open up screen. No water retrieved in bailer but moisture was observed at very bottom of bailer. Let sampling device sit for 15 minutes before attempting a grab sample again. Loose, saturated sand was observed in rods when tripping out. 8" casing is at 366'. Sampling devices pulled out, checked for damage, see photo. When dismantling device sand was packed into sheath. Sampling device was pressure washed then deconned again using four step decon procedure, reassembled, and sent back down hole to 376' to attempt to retrieve sample again. Sampling device was deployed and allowed to sit for 45 minutes while site crew took lunch.
10:28	
12:07	Sample retrieval attempted with several new bailers, vibrating sampler to open screen, pushing sampler device deeper, to no avail. L. Baader contacted L. Simmons for next steps. L Simmons approved request to advance coring 10' to 386' and attempting to retrieve sample at that depth.
16:26	Core drilled to 386' and was still in highly compact Lean clay layer, continued 10 more feet to 396' to attempt to collect sample where sandy lithology was observed. Sample DAVIS03-GW-003 was collected at 396' bgs at 1620.
17:04	L. Baader K. Keegan and YJD off site, security on site.

List of Samples Collected:	DAVIS-EB-032, DAVIS03-GW-003
Deviation from Plans:	VAS sample was collected 70' from first aquifer water table encounter sample due to inability to retrieve water sample at 376'.
Visitors on Site:	None.
Important Telephone Calls / Photos Taken:	L. Baader contacted L. Simmons for approval to take sample at modified depth.
Technician Signature:	
Technician Name (print):	
Lauren Baader	

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/18/2019

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70s	Date and Time:	03/11/19 20:52
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader replenished ice in sample cooler at 545 am. L. Baader K. Keegan and YJD on site. Safety tailgate meeting held.
07:05	L. Baader L. Simmons and S. Schneider phone call to discuss data gaps and sampling depths/ methods. Concluded to take last VAS sample between 415-420' bgs above screened portion of well. Will do short runs and observe core for sandy water bearing depths to minimize turbidity in sample. L. Baader sent photo of sample collected at 396' to show turbidity.
08:15	L. Baader called S. Sargent to coordinate pick up of 500 ft sounder. Driller tripped out and indicated approximately 80' of water in drill rods. WL measured with 300' sounder at 294.46'. Field equipment calibrated. PID SN: 592-17171 YSI SN: 03L0931AB
09:06	K. Keegan off site to switch out sounders with 500' sounder rented from Terratech in Phoenix, AZ
09:19	Helper off site to fill water truck using metered hydrant
09:22	L. Baader contacted Yuko with SGS to coordinate sample pick up at 3:30 pm at hotel - will ship IDW and water samples held over weekend.
09:40	Water sprayed in laydown area for dust control, begin coring 10 foot run to 406', then 5 foot runs to check for sandy lithology for VAS water sample above screened interval.
10:27	L. Simmons confirmed schedule with YJD to work through Thursday 3/14/19
12:00	Cored to 406', crew lunch break.
12:45	Continue with 5' runs from 406-411, 411-416', etc.
12:50	IDW sample IDW_SOIL_20190311 collected for rolloff bin #6253
13:30	Hydropunch deconned, DAVIS-EB-033 collected at 13:30. (sample later discarded)
14:38	Cores from 406-411 were clayey, L. Baader instructed drillers to advance core again. Hydropunch will be sent down at 416' and sounder will determine if water is present in sampling device and if so the final VAS water sample will be retrieved, along with MS/SD samples.
14:40	L. Baader off site to pack cooler and meet Yuko with SGS to ship samples.
16:06	Cuttings from 406-411 was dry, clayey sand, advised drillers to continue boring until 416. Cuttings from 411-416 were also dry, clayey sands. While coring from 416-421, K. Keegan observed difficulty pushing through and driller reported abnormally high torque. At that point, k. Keegan advised drillers to continue running core 10 feet to 426. Cuttings were dry to moist, highly compact with high fines content. No free water observed. 5' of core was pushed in effort to determine any sandy lenses or water, drilled had less torque pushing through, cuttings had high silt content with low moisture.
16:50	L. Baader back on site and observed logs/cores and agreed to continue drilling to 441', since we had already passed screened interval depth that VAS sample had been planned to be above. L. Baader sent photos to L. Simmons of cuttings and K. Keegan informed L. Simmons of change of sampling plan, will discuss plans moving forward in the morning.
17:30	Depth reached by end of day = 441' bgs.

List of Samples Collected:	DAVIS-EB-033 (later discarded)	Technician Signature:
Deviation from Plans:	VAS sample planned for 415-420' was not collected due to lithology constraints.	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	AM call with base lead and field coordinator to discuss sampling plan.	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/18/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Investigation of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Cloudy, rain, 50s-60s	Date and Time:	03/12/19 19:09
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader K. Keegan and YJD on site. Safety tailgate meeting held. Initial WL = 293.80.
09:50	L. Baader call with L. Simmons to discuss well construction plans. Logs sent to L. Simmons. Discussed moving screened interval to zone with less compact clays/silts. Drillers advances core to 451' bgs, clayey sands and silty sands observed to 451'.
10:30	L. Baader, K. Keegan, L. Simmons and S. Schneider call to discuss cores and screen interval options. Concluded to advance core to see lithology through 455 to determine if adequate sands/water to screen to 455'. L. Baader advised driller to advance core 5-7 feet to observe lithology to determine bottom of screened interval.
11:15	YJD crew lunch.
12:15	Continue coring from 451-456. Driller reported soft material from 451-456, advanced to 458' bgs
13:30	Silty sand continued from 451-456. Saturated soil observed from 453-456. L. Baader sent logs/photos to L. Simmons to determine final plans for screened interval based on new lithology information.
14:15	L. Simmons gave the go ahead to set well screen from 435-455'. Crew began loading well casing to prepare for setting well. Well construction measurements: 2 x 0.020" slotted screen 10' 1/4"
14:37	44 x Riser 10' 1/2" End cap 2" See well construction details for all measurements.
15:43	Begin assembling well, see photos. DAVIS-EB-033 collected at 1550 off tag line after 4 stage decon procedure, that was assembled with approved shrink tubing. Bottom of borehole tagged at 457' bgs. 2 10-foot 4" diameter 0.020" slotted schedule 80 PVC screen sections installed with PVC end cap. 44 10-foot schedule 80 PVC riser sections installed and suspended.
18:10	Bottom of well tagged at 455' bgs. 6 bags 12-20 Silica sand added as filter pack tagged at 450' bgs. Well construction will resume tomorrow. L. Baader, K. Keegan, and YJD off site. Security on site.

List of Samples Collected:	DAVIS-EB-033	Technician Signature:
Deviation from Plans:	Screened interval of well changed to 435-455.	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	Phone calls between L. Simmons, K. Keegan and L. Baader discussing well screen zone modifications.	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/18/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Rainy, cloudy, 60s	Date and Time:	03/13/19 07:08
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:35	L. Baader replenished ice in sample cooler. L. Baader, K. Keegan, YJD on site. Safety tailgate meeting held.
06:51	Equipment warmed/material added to filter pack tagged at 150.3' bgs, settled 0.3' from yesterday. Casing at 456'. L. Baader had phone call with L. Simmons about swabbing/surging filter pack, YJD indicated that there is not enough winch line on site to feed scrubber to screen depth.
08:24	Drillers contacted their project manager to see what it would take to accommodate request to scrub screen. Several hours will be required to transport winch line from Phoenix, tower down and install, and continue. Instructed drillers to continue adding filter pack to 432' and then wait for further instructions.
10:15	Well installation SOPs reviewed. Filter pack was installed using free fall/casing as tremie to bottom of well. In future, tremie should be used to ensure no bridging of screen material.
11:08	Casing pulled to 425' and dog collared. Sand pack tagged at 431' after pulling casing. Towered down boom to prepare to install winch line.
11:21	Crew off site for lunch. L. Baader contacted Yuko with SGS to coordinate sample shipping DAVIS-EB-033 (tagline EB) to SGS Orlando at 13:30. L. Baader off site to print chain and prep cooler to ship samples. YJD on site with winch. Began changing out winch line.
13:00	L. Baader handed off samples to Yuko for shipping at 13:30. COC signed and sent to L. Simmons. COC and sample tracker emailed to L. Simmons.
14:50	Winch line installed. Decon pad set up to decon surge block and bailer, see photos.
15:42	Bailer and surge block deconned using pressure washer. Begin scrubbing and bailing screen. Screen material will be tagged once scrubbing is complete to check for subsidence of filter pack. More filter pack will be added if subsidence is observed.
16:31	Drill crew had trouble removing the well cap. Sending down the swab/surge block. L. Baader discussed with drill crew on regarding surging SOPs, start at bottom of well, in 3-5' increments, slow movement.
17:02	Tagged bottom of well at 455', filter pack at 429.4' after scrubbing for 30 minutes. Sand pack
17:10	Bailed liquid had suspended silt, no fine sands or unsuspected sediment observed. 10 gals total removed. Water had burnt rubber odor. Filter pack tagged at 431' again after bailing.
17:39	3 50-lb buckets of bentonite chips added to hole slowly.
18:20	Phone call with L. Simmons discussing surging/bailing results and seal addition. Casing pulled to 414 to prevent swelling of chips into casing. Asked if 5' casing available, none on site.
18:45	L. Baader, K. Keegan, and YJD Off site, security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	Needed to acquire winch - scrubbing screen was detailed in SOPs	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	Phone calls between L. Simmons, S. Schneider and K. Keegan discussing screen scrubbing SOPs	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/18/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70s	Date and Time:	03/14/19 18:43
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:	
<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader and YJD on site. Safety tailgate meeting held.
07:00	Rig warmed up, set up bin for grout mixing, L. Baader performed calculations of annular volume for grouting. L. Baader called L. Simmons to discuss calculations and lift volumes. Discussed doing 120' lifts to prevent heat of hydration from melting well casing. Also discussed decon procedures for tremie pipe. ISWP and SOPs do not require decon of tremie for grout placement, tremie was deconned at yard by YJD prior to mob to site. Tremie will not be deconned on site.
08:00	L. Simmons called and renewed blue-stake ticket for another 15 days - will need to be renewed again 3/28/19 - reminder set. L. Baader asked on site security what schedule is for weekend. Security will be on site from 1pm-7am with 6 hour rest period 7am-1pm. Security remains on site during rest. Crew will secure well such that it cannot be accessed without operating rig.
10:02	L. Simmons gave go-ahead to begin mixing grout. 60 gallon batches will consist of 12 bags cement, 1/2 bag of bentonite (25 lbs.). One batch calculated to fill 30 feet of annular volume. First lift started.
11:08	First lift completed. 4 total batches, 12 bags of cement, 25 lbs. of bentonite, and 40 gal of water mixed per batch. L. Simmons confirmed approval to perform 2 lifts today. Will wait to tag first lift at 1600 then do second lift. YJD will pull 8" casing, work on cleaning and securing site while waiting for first lift to cure.
11:27	L. Baader notified crew of plan to do second lift at 1600. Begin pulling 120' casing. Casing at 296' bgs. 160' 8" casing deconned on decon pad.
12:58	Crew lunch.
13:45	Crew onsite cleaning/securing site. L. Simmons advised tagging grout at 1530.
15:40	Grout tagged at 300'. Tremie run to 300 feet.
16:00	Begin second lift of grout. 4 batches total will be mixed, approximately 120 feet.
17:04	Finished grouting, 4 batches total, to 180 feet. Start pulling 8" casing.
17:55	200' of 8" casing pulled. Will be deconned at start of shift next week. 50' 9" casing removed.
18:27	340' total 8" casing removed, 50' 9" casing removed. Casing secured with drill rig, see photos.
18:39	L. Baader and YJD off site. Security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	Deconning casing and secured well for weekend.	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/18/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	03/19/19 06:57
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
07:30	L. Baader K. Keegan and YJD on site. Safety tailgate held.
07:39	Grout tagged at 200' bgs
08:58	Four batches of grout mixed and tremied down hole as per SOP
10:03	First lift complete. Tentative tag grout at 260'. Will tag again before adding more grout. Casing pulled to 240' bgs
11:48	WL tagged at 290.55'. Bottom of well tagged at 455'.
13:16	Phone call with L. Simmons discussing grouting calculations, loss of grout to cobble zone, and clarification on materials on site. Confirmed 47 lbs bags of grout available on site. L. Simmons advised to tell drillers to mix another 100 foot lift of grout asap and tag well.
14:20	Finish grouting, 5 batches total in 9" diameter borehole from 200'. Casing pulled to 70' bgs.
15:41	Grout tagged at approximately 92'. L. Baader asked L. Simmons to complete 3 more batches, approx 40 feet.
16:30	Third lift begin. 3 batches total.
17:45	Third lift completed; grout tagged at 44' bgs, all remaining 9" casing pulled. 12" casing at 20'.
17:45	L. Baader, K. Keegan and YJD off site. Security on site.
Note:	Phone call with Hector (Tucson Water) asked about drilling schedule. Relayed information that we will be drilling later this week. He said he would call in advance if they planned to visit the site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	Phone call with L. Simmons discussing grout lift schedule. Call from Hector about drilling schedule	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel 	QA/QC Date:	3/27/2019
--------------------	----------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	03/20/19 18:02
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:33	L. Baader, K. Keegan, YJD on site. Safety tailgate meeting held.
07:15	WL = 289.97' bgs, grout = 48' bgs.
08:06	Loaded 20' conductor casing into box truck.
09:47	Lowered 20' conductor casing, and suspended in hole. 1.5 batches of grout added to bring grout from 48' to 20' bgs. 12" casing pulled.
11:20	One batch of cement added to hole securing conductor/surface casing. Site cleaning and prepping for decon. Update sent to L. Simmons on schedule for today. L. Baader discussed surface completion specs with YJD, including 3.5 foot monument construction for flood protection.
12:33	More batches of cement added to ground surface. Will let set during lunch.
13:15	Crew returned from lunch, begin deconning rig, drill platform, 8" casing, all casing in box truck, drill rods, etc. all downhole equipment deconned using steam pressure washer on decon pad. Excess water pumped into poly tank.
16:30	MW03003 cleared to 5 feet bgs using hand auger and spoon. Drill rig mobilized to MW03003. Box truck and rig staged to start drilling tomorrow morning.
17:06	Begin construction of surface completion MW03002. Protective casing inspected for damage, see photos. Sand poured into annular space of protective casing. Protective casing set with concrete using sonotube for shape and leveled. Top of casing above concrete measured at 3.5'. protective casing locked using temporary lock and secured.
17:59	L. Baader, K. Keegan and YJD off site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	None	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70s	Date and Time:	03/21/19 17:19
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader, K. Keegan and YJD on site, site safety meeting held.
08:15	Staging casing and drill rig to prepare for drilling.
08:59	Noel Garland on site. Safety tailgate meeting held and HASP reviewed. PFAS protocol reviewed. DAVIS-EB-034 collected off lead casing = 7" core barrel at 9:30 am using PFAS lot #112918, see grab sample form.
09:30	PID SN # 592-914351 calibrated. Begin drilling MW03003.
10:42	Driller broke a drill rod. Working to get it out. Contacted Yuko with SGS to coordinate sample transport for 3pm.
11:50	Drill rod and core retrieved to 30'.
12:05	Lunch. L. Baader off site to print chain for EB.
13:30	Push 12" casing, cleanout runs.
15:30	L. Baader handed off equipment blank to Yuko for shipping to SGS Orlando at 1500. Continue coring from 30, logging soils and screening with PID
17:17	Finish coring at 76' bgs. Push casing and cleanout runs. L. Baader, N. Garland, K. Keegan, and YJD offsite.

List of Samples Collected:	DAVIS-EB-034	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	None	
		Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/27/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 70s	Date and Time:	03/22/19 18:29
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader, N. Garland, YJD on site. Safety tailgate meeting held
07:32	Site prep for drilling, PID calibrated SN # 592917171
08:15	Begin coring from 76' bgs, soil logging and PID screening PID reading high; other PID calibrated and used for rest of the day. SN 592914351
10:28	Tucson water on site, safety tailgate meeting held, will collect soil samples every 5 feet and mix to get representative soil sieve analysis.
11:52	Tucson water off site. Collected samples from 76-116' every 5 feet. Will return at the end of day to collect remaining samples prior to dumping cuttings into roll off bin. Discussed coming on weekend to collect more samples. Will call ahead of time if weekend samples will be collected.
12:15	Large cobble/boulder encountered at 76' while pushing casing, had to trip out all casing and trip back in to check for damage. Core retrieved. All casing tripped back in, no damage observed. Crew lunch.
16:26	Max Campos from Tucson water on site to collect soil samples 115-146'.
18:32	Total depth cored to 176' bgs. L. Baader, N. Garland, M. Campos and YJD off site, security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Jane Patel, Hector Zamora, Jerry Huerstel, Max Campos	Technician Name (print): Lauren Baader
Important Telephone Calls / Photos Taken:	Phone call with Hector Zamora at 9:30 to coordinate site visit for 1030. Phone call with L. Simmons discussing sample shipping. Will hold all samples on ice until end of shift and ship Thursday. Pending status of IDW samples due to hold times.	
QA/QC'd by:	Thomas W. Hensel 	QA/QC Date: 3/27/2019

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny	Date and Time:	03/23/19 18:41
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader N. Garland YJD on site. Site safety meeting held.
07:15	L. Baader off site to get safety signage.
07:40	Begin tripping in 9" casing. Having trouble pushing casing through tight lithology. N. Garland contacted L. Simmons/ S. Schneider for approval to advance 8" casing from 146' bgs. Request approved to use 8" casing.
09:41	Continue coring from 176' bgs.
11:11	Begin deconning 8" casing
11:54	Load 8" casing into box truck
14:15	L. Baader checked exit, made sure it was clear in case of emergency.
17:03	Max Campos from Tucson water on site to collect soil samples. Safety tailgate meeting held.
17:33	Depth reached at end of day = 246' bgs. Roll off bin #6577 full. Started roll off bin #5430 with cuttings from 176' to 246' MW03003
18:00	L. Baader, N. Garland, YJD offsite. Security on site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	Push 8" casing from 146' instead of 197' due to tight lithology- easier to push 8" casing. Approved by S. Schneider	
Visitors on Site:	Max Campos	Technician Name (print):
Important Telephone Calls / Photos Taken:	Phone call with S. Schneider to approve casing diameter change.	Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	03/24/19 18:55
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:36	L. Baader, N. Garland, and YJD on site. Rig warm up and paperwork. L. Baader filled cooler with ice at 5:45 am.
07:09	Site safety meeting held.
07:30	L. Baader phone call with L. Simmons to discuss well construction details; will determine based on water table level. PID calibrated SN #592-914351
11:17	Decon station set up, new buckets used and decon solution replenished. Potable water from YJD water truck used to mix. Bucket #1: Potable water + alconox (7 packets total) Bucket #2: potable water Bucket #3: potable water Bucket #4: DI water rinse collection. All buckets labeled and stored on decon pad.
14:26	Log 270-296 sent to L. Simmons for review. Moisture observed in core beginning at 286' bgs.
14:55	WL in borehole tagged 285.6. Hydropunch deconned and DAVIS-EB-035 collected off hydropunch PFAS Free batch #112918 at 1455 and held on ice. WQ meters calibrated.
15:05	WL tagged at 285.34'. Hydropunch set at 297' bgs.
16:00	DAVIS03-GW-034 collected at 1600 at 297' bgs. MS and MDS also collected at this depth/time. Samples held on ice.
16:30	Continue coring from 297' bgs.
18:04	Depth reached by end of day = 306' bgs. Hector from at Tucson water contacted L. Baader at 1730 to inform he could not access site due to road closures. All cuttings from 246-306 deposited in roll off bin # 5430. L. Baader replenished ice in sample cooler for overnight storage.

List of Samples Collected:	DAVIS-EB-035, DAVIS03-GW-004, MS/MSD
Deviation from Plans:	None
Visitors on Site:	None
Important Telephone Calls / Photos Taken:	Phone call with L. Simmons discussing VAS sampling, lithology, and well construction details. Phone call with Hector coordinating sample pick up
Technician Signature:	
Technician Name (print):	
Lauren Baader	

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019



SUMMARY OF DAILY ACTIVITIES

Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, high 80s	Date and Time:	03/25/19 18:45
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:36	N. Garland and YJD on site. L. Baader on supply run. L. Baader replenished ice in sample cooler at 5:50 am.
07:30	Site safety meeting held by N. Garland.
07:45	WL tagged at = 285.2' bgs. L. Baader on site, signed tailgate.
08:47	PID SN calibrated. Turbidity meter calibrated. WQ meter calibrated. See equipment calibration forms.
14:21	2 pallets of cement and two buckets of Pel-plug bentonite chips delivered by YJD.
14:52	Max Campos with Tucson water texted L. Baader to coordinate soil sampling. He will arrive on site at 4 pm.
15:28	Hydropunch deconned, DAVIS-EB-036 collected at 15:20.
16:00	Max Campos from Tucson water on site to collect soil samples for sieve analysis from 306'-346'. Safety tailgate meeting held.
16:45	VAS sample DAVIS03-GW-005 collected at 347' bgs.
18:13	Depth reached by end of day 356'. Site cleanup.

List of Samples Collected:	DAVIS-EB-036, DAVIS03-GW-005	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Max Campos, Tucson Water	
Important Telephone Calls / Photos Taken:	Phone call with L. Simmons discussing scheduling phone call with Max Campos to coordinate sample pick up	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/27/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 90s	Date and Time:	03/26/19 17:53
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader, N. Garland, and YJD on site. Site safety meeting held.
07:03	WL in borehole tagged at 287' bgs.
07:04	PID calibrated. WQ meter and turbidity meter calibrated, see calibration forms.
13:02	Cored to 392' bgs by lunch time, saturated soil observed at 392' bgs. Sample will be taken at 393' bgs after lunch. Hector from Tucson Water texted L. Baader that they will be on site at 1500 to collect soil samples for sieve analysis.
13:40	Equipment Blank DAVIS-EB-037 collected from Hydropunch at 13:40 PFAS Free water Lot #112918
15:00	VAS sample DAVIS03-GW-006 collected at 15:00 at 393' bgs.
16:00	Hector Zamora from Tucson Water on site to collect soil samples. All cuttings deposited in roll off bin.
17:58	Hector, L. Baader, N. Garland and YJD offsite. Security on site.

List of Samples Collected:	DAVIS-EB-037, DAVIS03-GW-006	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Hector Zamora, Tucson Water	
Important Telephone Calls / Photos Taken:	None	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s-90s	Date and Time:	03/27/19 08:04
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:35	L. Baader, N Garland, YJD on site. Safety tailgate meeting held. L. Baader replenished ice in sample cooler at 5:40 am.
06:53	PID SN 592914351 calibrated.
12:15	Depth 456' reached by lunch, cores logged and logs sent to L. Simmons for review. Phone call with L. Simmons to discuss well screen interval. Will core another 5' to originally planned TD of 462' and send logs to determine well screen interval.
13:30	IDW soil samples collected for roll off bin #6577
14:00	IDW soil samples collected for roll off bin #5430
15:00	LB offsite to ship samples.
15:03	YJD begins breaking down drill rods and preparing to install the well.
15:52	Hector Zamora onsite to collect samples for sieve analysis.
16:33	YJD begin well installation. 4" well casing with 20 foot well screen and 430 foot of riser pipe.
17:10	Hector Zamora offsite.
17:20	Complete well casing to 450 ft bgs. 8" casing to 452 ft bgs.
17:28	Begin sand filter pack. Place approximately 2 ft of sand below well screen. Pour sand inside 8" casing and tag sand levels after each bag.
18:05	Complete sand to 426.5 ft bgs. 30 feet of 8" casing removed during sand installation.
18:13	Begin swabbing well at bottom of screen and work through entire screen interval.
18:45	Complete swabbing of well. Monitored sand level during swabbing and no change was observed. Top of sand is 426.5 ft bgs.
18:52	Bail the well using stainless steel bailer. Some silt and sand observed in the bailer.
19:15	Begin bentonite at MW03003. Pour three buckets slowly inside 8" well casing.
19:35	Top of bentonite at 423 ft bgs. Clean up site.
19:50	YJD and NG offsite.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Hector Zamora	
Important Telephone Calls / Photos Taken:	Well installation photos	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Area Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s-90s	Date and Time:	3/28/2019 14:00
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
6:30	N Garland, YJD on site. Safety tailgate meeting held.
7:15	Water level tagged at 286.3 ft bgs. Bentonite seal tagged at 418 ft bgs.
8:00	YJD Cleaning grout container and preparing to mix grout. L. Baader
9:30	Begin mixing grout. 1 batch - 12 bags cement @ 47 lbs each, 40 gal water, 25 lbs bentonite gel = 60 gallons grout slurry
11:05	Complete grout. 6 batches total mixed and tremmied into well.
11:25	Tagged grout at 277 ft bgs.
11:40	YJD pull 8" casing
12:40	Pulled casing to 236 ft bgs. Tagged grout at 280 ft bgs.
12:50	Begin cleaning up site.
13:45	N. Garland and YJD off site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	None	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/10/2019
--------------------	------------------	--	--------------------	-----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	04/02/19 18:58
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
08:30	L. Baader and YJD on site. Site safety meeting held.
09:00	Grout tagged at 280' bgs. Water level tagged at 289.5' bgs. YJD water truck off site to fill tank. Water sprayed on road for dust control.
09:45	Tremie pipe set at 270' bgs.
10:15	First lift of grout, each batch = 60 gallons, 12 bags of cement, 40 gal of water, and 25 lbs of bentonite. 4 batches total mixed for 100' lift in 8" diameter casing.
11:20	All 8" casing pulled. Casing brought over to decon pad. Sandy Elder from Tucson Water on site. Asked about progress and timelines. L. Baader informed him of tentative schedule and wrap up by end of the week. Off site at 1150.
12:49	Crew lunch.
13:21	Begin constructing bollards at MW03002, see photos. Grout in MW03003 tagged at 198' bgs.
15:20	Travis from Wood-Knoxville on site. Site safety meeting held. QPP and HASP reviewed, signed.
16:45	Begin mixing second lift of grout. Same amount of material per batch as above, 4 batches total mixed.
17:35	Pull 9" casing to 50' bgs.
18:57	L. Baader and YJD off site. YJD to Home Depot to pick up more cement to finish grouting tomorrow, grout tagged at 92' bgs at end of the day.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	None	
Visitors on Site:	Sandy Elder - Tucson Water	Technician Name (print): Lauren Baader
Important Telephone Calls / Photos Taken:	Photo of surface completion MW03002	

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------



SUMMARY OF DAILY ACTIVITIES

Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027	Task Order: 0004
Installation: DAVIS - Davis-Monthan AFB	Investigation Area: Basewide
Weather: Sunny, 75°F	Date and Time: 04/02/19 06:42
Technician(s): Samantha Sargent, Travis Stanley	

<u>Time</u>	<u>Observation/Comment</u>
08:05	Meet at front gate to set up
08:30	Pablo not at his office-Sent an email over. MW01001 has gate blocking entrance
09:00	MW03001: 303.33 ft btoc
09:18	ST-35-MW-43: 291.78 ft btoc
09:31	ST-35-MW-42: 298.45 ft btoc
09:54	Meet with Pablo for access. Drive with 3 other base personnel. Jay, Teresa, and Jen.
10:18	ST-35-MW-40: 340.02 ft btoc
10:29	ST-35-MW-29: 332.19 ft btoc
10:50	ST-35-MW-44: 330.54 ft btoc
11:38	MW02001: 282.75 ft btoc
12:09	MW01001: 351.86 ft btoc
12:15	Finished up- heading back to engineering building.
13:22	T Stanley On site well MW03003
16:30	T Stanley off site

List of Samples Collected: None	Technician Signature:
Deviation from Plans: None	
Visitors on Site: None	
Important Telephone Calls / Photos Taken: None	Technician Name (print): Travis Stanley

QA/QC'd by: Thomas W. Hensel		QA/QC Date:	4/9/2019
-------------------------------------	--	--------------------	----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, high 80s	Date and Time:	04/03/19 19:32
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:	
<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader, T. Stanley and YJD on site, safety tailgate meeting held.
07:30	WQ meters calibrated see calibration forms. Grout tagged at 92' bgs. WL= 289.15' bgs.
08:45	Development crew on site, Curt and Safety tailgate meeting held, HASP reviewed with new on site personnel. Two batches of grout to be mixed (calculated 30'/ batch) to bring grout to 20' bgs for setting conductor casing,
09:26	WL at MW03002 tagged at 292.55' btoc measured from the north side of the PVC. Begin deconning tremie pipe and sounding tube, bailers, and swab with high pressure washer.
10:17	Begin swabbing MW03002. Length of swab = 5' 3". Bottom of well tagged at 447. 4' btoc/444.49' bgs. 10 ft of sediment in screen based on tag. Cased well volume = 93.15 gal.
12:15	After bailing approx. 50 gallons of water and sludgy sediment, bottom of well was tagged at 457.8' btoc (=455' bgs). Initially, very thick sludge was bailed, then silty water was observed. Will continue to bail more to reduce fines before lowering pump. Conductor casing lowered to 20' bgs, grout tremied down into annular space to 20' (tagged) by 12:00. Cement tremied from 20' bgs to ground surface.
13:00	Total gallons of water bailed = 60. Bottom of well tagged at 457.8' btoc (=455' bgs). Begin lowering pump to depth of 440' bgs. See photos of pump for information. Have 26 pieces of 20' length tremie pipe = 520 total and one piece of 10' tremie pipe. Pump will be set at 440'
14:47	Begin pumping MW03002 at 5.5 gpm from 440'. Turbidity, parameters, flow rate, and water level measurements taken every 5 minutes for 45 minutes, then every 10 minutes for duration. Parameters were monitored for stabilization criteria.
17:21	Stabilization and turbidity criteria reached, pump shut down. Will remove pump and decon tomorrow morning.
17:48	Surface completion of MW03003 begin. Conductor casing grouted in place, concrete well pad and protective casing will be installed.
19:05	Concrete pad and protective casing installed at MW3003. L. Baader and YJD offsite. Security on site.

List of Samples Collected:	None	Technician Signature: Technician Name (print): Lauren Baader
Deviation from Plans:	None	
Visitors on Site:	None	
Important Telephone Calls / Photos Taken:	None	

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	04/04/19 19:36
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader T. Stanley and YJD on site. Site safety meeting held.
07:10	WQ and turbidity meters calibrated, see calibration logs.
09:20	Continue pumping MW03002 at 5.5 gpm with Grundfos pump with pump intake set at 451.5' BTOC. Trafficade on site to block off right lane for transport of roll off bin and demon of drill rig, box truck, water truck, and casing.
09:30	CT/United Rentals on site to remove empty roll off bin #5475 for transport off site. L. Baader signed for confirming bin pickup.
09:45	L. Baader spoke to Wood survey crew about base access, Travis off site to escort survey crew to benchmark located on base.
10:28	L. Baader had phone call with L. Simmons discussing tooling available to set pump intake as deep as possible into the well screen; with tooling available, pump intake was set at maximum depth of 454.5' BTOC =451.6 bgs. Limitations included 1.5' of pump below intake and lack of 5' sections of 1" steel tubing/tremie. Well screen tagged at 457.8' btoc. Decided to pump well at 5.5 gpm, pulling it up at 2 foot intervals for 10 minutes at each interval and take WQ and turbidity readings after 10 mins.
11:45	Begin pumping MW03002 at 454.5' btoc = 451.6' bgs. Pump was pulled up 2' within the screen to develop each 2' section of filter pack. WQ and turbidity readings were taken after 10 mins of pumping at each depth.
12:00	YJD crew finished well completion MW03003 with protective casing and bollards installed. Site cleaning and decon ongoing to prepare for demob.
13:45	Complete pumping 2' sections of screen to top of screen at MW03002, drop pump intake to 447.9' BTOC = 445' bgs. Begin monitoring for stabilization while pumping from center of screened interval.
14:30	Stabilization at MW03002 reached; pump shut down. Pump was removed, all sounding tube/1" diameter steel riser deconned withalconox and rinsed with pressure washer. Pump deconned withalconox and rinsed with pressure washer.
15:32	YJD drill crew off site; all drilling equipment removed from site.
14:52	Pump and decon of equipment from MW03002 development activities complete. Protective casings for both wells secured with temporary padlocks. All personnel off site.

List of Samples Collected:	None	Technician Signature:
Deviation from Plans:	Development repeated on MW03002 in order to ensure SOPs were followed for well development to standard.	
Visitors on Site:	None other than subcontractors expected on site.	
Important Telephone Calls / Photos Taken:	Phone calls with L. Simmons discussing protocol and SOPs for well development and placement of pump intake, etc.	Technician Name (print): Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, high 70s	Date and Time:	04/05/19 18:55
Technician(s):	Lauren Baader		

Description of Daily Activities and Events:

<u>Time</u>	<u>Observation/Comment</u>
06:30	T. Stanley and YJD development crew on site. Site safety meeting held. L. Baader off site for supply run.
07:10	Bottom of well tagged at 451.70' btoc. WL= 290.87' btoc. Begin swabbing well with surge block, starting from bottom and working upward in 5 foot intervals.
07:20	T. Stanley had conversation with L. Simmons regarding sampling schedule. Approval granted to wait for recovery following development of MW03003, and if 95% recovery is observed, groundwater sample can be collected without removing pump. Will decon pump 4-stage decon and collect equipment blank using lab certified PFAS free water prior to sending it down to well screen.
07:45	Begin bailing MW03003. Silty sludge observed in water, clearing over time. 60 gallons total bailed.
08:00	L. Baader on site; safety tailgate meeting held. Bailing well ongoing, discussed sample schedule with T. Stanley. T. Stanley off site at 0845 to leave for flight back to Knoxville, TN.
09:10	PFAS protocol checklist reviewed. Pump deconned using 4-stage method.
09:20	DAVIS-EB-038 collected at 09:20AM using PFAS free water batch #112818.
09:30	Bottom of MW03003 tagged at 453.65' btoc, consistent with well construction measurements.
09:35	Begin sending pump with sounding tube and riser down hole. 1" PVC, 1" steel casing, and all equipment used to install pump equipment deconned with alconox solution. Nitriles worn by all personnel handling downhole equipment.
11:10	Begin pumping MW03003 at 5.5 GPM with pump intake set at 451.5' btoc.
13:25	Bottom of well was pumped for 1 hour until turbidity cleared up. At 12:10 the pump was raised 2 feet and after 10 minutes a reading was taken. This continued for the rest of the screen in 2 foot intervals to 435.5' btoc.
13:25	Pump was shut down at 13:25. Rig needed to tower down to move trailer and pump off flat tank into liquid IDW storage. 10' of riser removed to bring pump intake to 441.5' btoc, center of the screen
14:35	WL tagged at 291.5' btoc before beginning to pump in center of screen. Begin pumping at 2.5 gpm at 14:35. Will monitor WQ parameters every 10 minutes until stability is achieved.
16:24	Last 3 consecutive readings were within stabilization criteria: one more reading will be recorded to confirm before shutdown to let well recover.
16:30	Development stabilization criteria reached: pump shut down. WL monitored every 5 minutes to observe recovery. WL before shutdown =395.08
16:35	WL= 389.98 16:40 = 356.98' 16:45 = 333.23' 16:50= 306.78' 16:55 = 296.45' 17:00 = 294.34'
17:00	Pump turned on, adjusted to flow rate of 2 GPM, monitoring for stabilization prior to grab sample begin.
17:20	Stabilization achieved after observing 3 consecutive readings within stabilization criteria.
17:25	DAVIS03-GW-007 collected at 1725 pm. Pump shut down, tower down, and secure well. Will remove all riser, sounding tube, and pump tomorrow morning.
17:45	All personnel off site.

List of Samples Collected:	DAVIS-EB-038, DAVIS03-GW-007
Deviation from Plans:	None
Visitors on Site:	None
Important Telephone Calls / Photos Taken:	Photos of pump decon procedure
Technician Signature:	
Technician Name (print):	
Lauren Baader	

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	4/9/2019
--------------------	------------------	--------------------	----------

SUMMARY OF DAILY ACTIVITIES



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Investigation Area:	AFFF Area 3
Weather:	Sunny, 80s	Date and Time:	04/06/19 15:55
Technician(s):	Lauren Baader		

<u>Time</u>	<u>Observation/Comment</u>
06:30	L. Baader and YJD development crew on site, safety meeting held.
06:45	Pump pulled from MW03003. All riser casing and sounding tube deconned usingalconox and steam cleaned. WQ and turbidity meters calibrated, see calibration forms.
07:43	Flat tank pumped off into IDW liquid poly tank; pump deconned using 4 stage decon.
08:30	DAVIS-EB-038 collected off Grundfos pump. Begin setting pump in MW03002.
09:30	Pump set at 444.5' btoc; begin pumping at 5.5 gpm. Will monitor parameters every 10 minutes to check for stabilization of parameters before groundwater sample is collected.
11:45	Stabilization of parameters achieved after 1.5 hours of pumping at 5.5 gpm.
11:55	DAVIS03-GW-008 collected at 11:55. Pump shut down. All riser and pump pulled. L. Baader cleaned site and removed all trash and ensured well caps were locked and secured. "After" photos taken of site, see photo log.
14:00	IDW liquid samples collected from poly tank using bailer - IDW_Liquid_20190406. All samples collected stored in coolers on ice. Samples will be held on ice until Monday when they will be shipped to SGS Orlando, FL.
14:30	Final site cleaning complete; L. Baader secured ladder for liquid IDW poly tank to roll off bin with padlock and chain. Wells secured with combination padlocks. All personnel off site.

List of Samples Collected:	DAVIS-EB-039, DAVIS-GW-008, IDW_Liquid_20190406
Deviation from Plans:	None.
Visitors on Site:	None.
Important Telephone Calls / Photos Taken:	Photos of site after demob, photos of final well completion, of Roll off bins and liquid IDW labeled with contents.
Technician Signature:	
Technician Name (print):	
Lauren Baader	

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

Appendix B-2
Daily PFAS Protocol Checklists

This page intentionally left blank.

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 80s
Site/Area Name:	AFFF Area 03	Date and Time:	03/05/19 07:22
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/14/2019
--------------------	------------------	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 80's
Site/Area Name:	AFFF Area 3	Date and Time:	03/06/19 09:38
Field Manager:	Lauren Baader - Enviromental Tech I		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by: Thomas W. Hensel

QA/QC Date:

3/15/2019

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Cloudy, 70's
Site/Area Name:	AFFF Area 3	Date and Time:	03/07/19 09:54
Field Manager:	Lauren Baader - Enviromental Tech I		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by: Thomas W. Hensel

QA/QC Date:

3/15/2019

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Program Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Cloudy, 60's, light breeze
Site/Area Name:	AFFF Area 3	Date and Time:	03/08/19 10:40
Field Manager:	Lauren Baader - Field Lead		

<p>Field Clothing and PPE (as applicable):</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Field crew in compliance with Tables 1 and 2, SOP AFW-01 <input checked="" type="checkbox"/> Field crew has not used fabric softener on clothing <input checked="" type="checkbox"/> Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning <input checked="" type="checkbox"/> Field crew has not applied unacceptable sunscreen or insect repellent <p>Field Equipment:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> No Teflon® containing materials on-site <input checked="" type="checkbox"/> All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene <input checked="" type="checkbox"/> No waterproof field books on-site other than Rite-in-the-Rain® Products <input checked="" type="checkbox"/> No plastic clipboards, binders, or spiral hard cover notebooks on-site <input checked="" type="checkbox"/> No adhesives (Post-it® Notes) on-site <input checked="" type="checkbox"/> Coolers filled with regular ice only. No chemical (blue) ice packs in possession 	<p>Sample Containers:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE <input checked="" type="checkbox"/> Caps are lined or unlined and made of HDPE or polypropylene <p>Wet Weather (as applicable):</p> <p>For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only</p> <p>Equipment Decontamination:</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> "PFAS-free" water on-site for decontamination of sample equipment <input checked="" type="checkbox"/> Alconox and Liquinox to be used as decontamination materials <p>Food Considerations:</p> <p>No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area</p>
--	--

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

<p>Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:</p> <p align="center">None</p>	<p>Signature:</p>
	<p>Name (print):</p> <p align="center">Lauren Baader</p>

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/15/2019
--------------------	------------------	--	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 70's
Site/Area Name:	AFFF Area 3	Date and Time:	03/09/19 08:00
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by: Thomas W. Hensel

QA/QC Date:

3/18/2019

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 60s
Site/Area Name:	AFFF Area 3	Date and Time:	03/10/19 07:44
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by: Thomas W. Hensel

QA/QC Date:

3/18/2019

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Investigation of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Rainy, 60s, partly cloudy
Site/Area Name:	AFFF Area 3	Date and Time:	03/12/19 15:31
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by: Thomas W. Hensel

QA/QC Date:

3/18/2019

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 70s
Site/Area Name:	AFFF Area 3	Date and Time:	03/21/19 09:24
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 80s
Site/Area Name:	AFFF Area 3	Date and Time:	03/24/19 14:41
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance: <p align="center">None</p>	Signature:
	Name (print): Lauren Baader

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/27/2019
-------------------------------------	------------------------------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, high 80s
Site/Area Name:	AFFF Area 3	Date and Time:	03/25/19 15:11
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, high 80s
Site/Area Name:	AFFF Area 3	Date and Time:	03/26/19 12:55
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	3/27/2019
--------------------	------------------	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 75°F
Site/Area Name:	Basewide	Date and Time:	04/02/19 08:00
Field Manager:	Samantha Sargent		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Samantha Sargent

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 90s
Site/Area Name:	AFFF Area 3	Date and Time:	04/03/19 08:37
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	4/9/2019
--------------------	------------------	--------------------	----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, 70s-80s
Site/Area Name:	AFFF Area 3	Date and Time:	4/4/2019 7:15
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/10/2019
--------------------	------------------	--	--------------------	-----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, high 70s
Site/Area Name:	AFFF Area 3	Date and Time:	04/05/19 08:30
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	4/9/2019
--------------------	------------------	--------------------	----------

**ATTACHMENT 1 TO SOP AFW-01
DAILY PFAS PROTOCOL CHECKLIST**



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Weather (temp./precipitation):	Sunny, mid 60s
Site/Area Name:	AFFF Area 3	Date and Time:	04/06/19 07:45
Field Manager:	Lauren Baader - Field Lead		

Field Clothing and PPE (as applicable):

- Field crew in compliance with Tables 1 and 2, SOP AFW-01
- Field crew has not used fabric softener on clothing
- Field crew has not used cosmetics, moisturizers, hand cream, or other related products on exposed body parts this morning
- Field crew has not applied unacceptable sunscreen or insect repellent

Field Equipment:

- No Teflon® containing materials on-site
- All sample materials made from stainless steel, HDPE, acetate, silicon, or polypropylene
- No waterproof field books on-site other than Rite-in-the-Rain® Products
- No plastic clipboards, binders, or spiral hard cover notebooks on-site
- No adhesives (Post-it® Notes) on-site
- Coolers filled with regular ice only. No chemical (blue) ice packs in possession

Sample Containers:

- All sample containers made of HDPE or polypropylene. Samples are not stored in containers made of LDPE
- Caps are lined or unlined and made of HDPE or polypropylene

Wet Weather (as applicable):

- For personnel in direct contact with samples and/or sampling equipment, wet weather gear made of Vinyl, polyurethane, PVC, latex or rubber-coated materials only

Equipment Decontamination:

- "PFAS-free" water on-site for decontamination of sample equipment
- Alconox and Liquinox to be used as decontamination materials

Food Considerations:

- No food or drink on-site with exception of bottled water and/or hydration drinks (i.e., Gatorade and Powerade) that is available for consumption only in the staging area

If any applicable boxes cannot be checked, the Field Manager shall describe the noncompliance issues below and work with field personnel to address noncompliance issues prior to commencement of that day's work. Corrective action shall include removal of noncompliance items from the investigation area or removal of worker offsite until in compliance. Repeated failure to comply with PFAS sample protocols will result in the permanent removal of worker(s) from the investigation area.

Describe the noncompliance issues (include personnel not in compliance) and action/outcome of noncompliance:

None

Signature:

Name (print):

Lauren Baader

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	4/9/2019
--------------------	------------------	--	--------------------	----------

This page intentionally left blank.

Appendix B-3
Tailgate Safety Meeting Reports

This page intentionally left blank.

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	02/27/19 09:15
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Initial Kickoff Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|---|---|
| <input checked="" type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input checked="" type="checkbox"/> Accident Reporting Procedures
<input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input checked="" type="checkbox"/> Injury/Illness Reporting Procedures
<input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|---|---|

Safety suggestions by site workers:	Flying debris, dust, traffic, spotters be aware
Action taken on previous suggestions:	NA
Injuries/accidents/personnel changes since previous meeting:	NA
Observations of unsafe work practices/conditions that have developed since previous meeting:	NA
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	NA
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Charles Odonal	Yellow Jacket Drilling				
Joshua Alster	Yellow Jacket Drilling				
Eric Olsen	Yellow Jacket Drilling				
Jake Iagana	Yellow Jacket Drilling				
Bellamy Mong	TDOT				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/14/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Insepction of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	02/28/19 07:05
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|---|--|
| <input type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input checked="" type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|---|--|

Safety suggestions by site workers:	N/A
Action taken on previous suggestions:	N/A
Injuries/accidents/personnel changes since previous meeting:	N/A
Observations of unsafe work practices/conditions that have developed since previous meeting:	N/A
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	N/A
Other Safety Topics Discussed:	N/A
Additional comments:	N/A

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Joshua Alster	YJD				
Chales Odonal	YJD				
Eric Olsen	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/14/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/01/19 09:00
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|---|--|
| <input type="checkbox"/> Site History/Site Layout
<input type="checkbox"/> Scope of Work
<input checked="" type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|---|--|

Safety suggestions by site workers:	N/A
Action taken on previous suggestions:	N/A
Injuries/accidents/personnel changes since previous meeting:	N/A
Observations of unsafe work practices/conditions that have developed since previous meeting:	N/A
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	N/A
Other Safety Topics Discussed:	NA
Additional comments:	N/A

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Sam	YJD				
Chales Odonal	YJD				
Eric Olsen	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/14/2019
-------------------------------------	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/04/19 10:46
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Initial Kickoff Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input checked="" type="checkbox"/> Medical Surveillance Requirements <input checked="" type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input checked="" type="checkbox"/> Air Surveillance Type and Frequency <input checked="" type="checkbox"/> Monitoring Instruments and Personal Monitoring <input checked="" type="checkbox"/> Action Levels <input checked="" type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input checked="" type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input checked="" type="checkbox"/> Engineering Controls | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PPE Required/PPE Used <input checked="" type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input checked="" type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input checked="" type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input checked="" type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input checked="" type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	Spotters for backing. Spot bike trail.
Action taken on previous suggestions:	Tape
Injuries/accidents/personnel changes since previous meeting:	Kickoff
Observations of unsafe work practices/conditions that have developed since previous meeting:	Kickoff
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	MW03002
Other Safety Topics Discussed:	Public
Additional comments:	Site exit

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Laura Simmons	Wood				
Gabriel Madge	YJD				
Kyle Keegan	Wood				
Dennis Heyerdahl	AGEISS/AFCEC				
Cody Gabala	YJD				
Tristan Truax	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/14/2019
-------------------------------------	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/05/19 06:54
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Site History/Site Layout
<input type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	None
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				
Laura Simmons	Wood				
Dennis Heyerdahl	AGEISS/AFCEC				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date:	3/14/2019
------------------------------	--	-------------	-----------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/06/19 13:23
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input checked="" type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input checked="" type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	--

Safety suggestions by site workers:	Rig maintenance, careful when working with hydraulic lines
Action taken on previous suggestions:	Spill kit
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	Look carefully when exiting the site

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Laura Simmons	Wood				
Kyle Keegan	Wood				
Richard Hoyt	Yellow Jacket Drilling				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/15/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/07/19 06:41
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	---

Safety suggestions by site workers:	Pinch points, rotating machinery, stop work if necessary
Action taken on previous suggestions:	Continuing to be aware of surroundings
Injuries/accidents/personnel changes since previous meeting:	Many site visitors
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Hospital route reviewed
Other Safety Topics Discussed:	NA
Additional comments:	Site sanitation and cleanliness

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Kyle Keegan	Wood				
Richard Hoyt	YJD				
Cody Gabala	YJD				
Gabriel Madge	YJD				
Laura Simmons	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/15/2019
-------------------------------------	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/08/19 07:01
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	---

Safety suggestions by site workers:	None
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				
Max Campos-Alvarez	TW				
Hector Zamora	TW				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date:	3/15/2019
-------------------------------------	--	--------------------	-----------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/09/19 06:47
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Clear communication leads to safe work
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	No changes
Observations of unsafe work practices/conditions that have developed since previous meeting:	Dogs on site - be aware
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/18/2019
-------------------------------------	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/10/19 07:05
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input checked="" type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	Dust control increased to prevent blowing dust - will be windy today
Action taken on previous suggestions:	Stop work to discuss plans
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Rain tomorrow - move to higher ground if flash flood warning, monitor for lightening in area
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan truax	YJD				
Gabriel Madge	YJD				
Cody gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field lead	

QA/QC'd by: _____ **QA/QC Date:** _____

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/11/19 06:47
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	--

Safety suggestions by site workers:	Complacency- everything has been safe so far, don't get comfortable and stay aware/cognizant of hazards. Especially when taking samples on drill deck.
Action taken on previous suggestions:	Equipment inspected regularly
Injuries/accidents/personnel changes since previous meeting:	Visitors will be on site today, ensure proper PPE and
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/18/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/12/19 06:50
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Careful with wet equipment, entering/exiting drill platform - use handrails.
Action taken on previous suggestions:	Reviewed drill platform safety.
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	Monitor for lightning during storms

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/18/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/13/19 06:38
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input checked="" type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	Wet conditions, slippery, watch footing.
Action taken on previous suggestions:	Continue to be vigilant ring/on/exiting drill platform.
Injuries/accidents/personnel changes since previous meeting:	None, wet conditions will continue.
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/18/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/14/19 07:15
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|---|---|
| <input type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input checked="" type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|---|---|

Safety suggestions by site workers:	Don't rush, last day before break, stay vigilant, wear dust masks when mixing concrete/bentonite
Action taken on previous suggestions:	None, no weather hazards today.
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/18/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/19/19 07:36
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Remain vigilant about entering/exiting site crossing bike path.
Action taken on previous suggestions:	NA
Injuries/accidents/personnel changes since previous meeting:	None, all same on site
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Hospital route reviewed
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Gabe Madge	YJD				
Tristan Truax	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/20/19 06:38
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	--

Safety suggestions by site workers:	Change out/get extra dust masks for mixing grout
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	No changes, additional personnel on site tomorrow will review HASP
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	Back to drilling tomorrow; will set up new safety perimeter with tape and cones.

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Gabe Madge	YJD				
Tristan Truax	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/21/19 06:45
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input checked="" type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	--

Safety suggestions by site workers:	Don't block road from MW03003 in case of emergencies
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	Noel Garland from Knoxville on site, new to site
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Route to hospital reviewed with new personnel
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Gabe Madge	YJD				
Tristan Truax	YJD				
Cody Gabala	YJD				
Kyle Keegan	Wood				
Noel Garland	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/27/2019
-------------------------------------	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/22/19 07:15
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input checked="" type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input checked="" type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	Be aware of extra personnel set up safety perimeter with caution tape
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	Site visitors anticipated
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood		Jerry Huerstel	Tucson Water	
Kyle Keegan	Wood		Max Campos	Tucson Water	
Cody Gabala	YJD				
Gabriel Madge	YJD				
Noel Garland	Wood				
Tristan Truax	YJD				
Jane Patel	Tucson Water				
Hector Zamora	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/23/19 08:19
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	--

Safety suggestions by site workers:	Signage to warn people not to touch equipment when we are working away from laydown yard.
Action taken on previous suggestions:	Signage posted.
Injuries/accidents/personnel changes since previous meeting:	No personnel changes
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Route to hospital may be blocked. Need to make sure we are extra careful today because it will be difficult to coordinate emergency response personnel due to large volume of people in area and road closures.
Other Safety Topics Discussed:	NA
Additional comments:	Golf links road closure for Tucson Air Show. Will need to be vigilant about emergency response procedures. Also need to remain focused during show.

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabiel Madge	YJD				
Cody Gabala	YJD				
Noel Garland	Wood				
Max Campos	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/24/19 07:10
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|---|--|
| <input checked="" type="checkbox"/> Site History/Site Layout
<input checked="" type="checkbox"/> Scope of Work
<input type="checkbox"/> Personnel Responsibilities
<input type="checkbox"/> Medical Surveillance Requirements
<input type="checkbox"/> Training Requirements
<input type="checkbox"/> Safe Work Practices
<input checked="" type="checkbox"/> Logs, Reports, Recordkeeping
<input type="checkbox"/> Sanitation and Illumination
<input type="checkbox"/> Air Surveillance Type and Frequency
<input type="checkbox"/> Monitoring Instruments and Personal Monitoring
<input type="checkbox"/> Action Levels
<input type="checkbox"/> Accident Reporting Procedures
<input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications)
<input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences
<input type="checkbox"/> Engineering Controls | <input checked="" type="checkbox"/> PPE Required/PPE Used
<input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures
<input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines)
<input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment
<input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate)
<input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.)
<input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.)
<input type="checkbox"/> Hazardous Materials Spill Procedures
<input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.)
<input type="checkbox"/> Injury/Illness Reporting Procedures
<input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines
<input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects)
<input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|---|--|

Safety suggestions by site workers:	Spotters for backing in tight area.
Action taken on previous suggestions:	Signage posted to prevent trespassers on laydown yard.
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Monitor exit to keep clear of vehicles.
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Noel Garland	Wood				
Tristan Truax	YJD				
Cody Gabala	YJD				
Gabriel Madge	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/25/19 07:30
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	--

Safety suggestions by site workers:	Dust control, watch temperature, stay hydrated
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Noel Garland	Wood				
Cody Gabala	YJD				
Gabriel Madge	YJD				
Tristan Truax	YJD				
Max Campos	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/27/2019
------------------------------	-----------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/26/19 07:07
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input checked="" type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	---

Safety suggestions by site workers:	Quick but safe- have a lot of ground to cover, but safety is more important.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Noel Garland	Wood				
Cody Gabala	YJD				
Gabriel Madge	YJD				
Tristan Truax	YJD				
Hector Zamora	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/27/19 06:40
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Stay focused, second to last day of shift don't get complacent
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Cody Gabala	YJD				
Gabriel Madge	YJD				
Tristan Truax	YJD				
Noel Garland	Wood				
Hector Zamora	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/9/2019
-------------------------------------	--	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	03/28/19 07:00
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input checked="" type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	--

Safety suggestions by site workers:	Dust masks for mixing concrete, take time and be safe, stay focused, last day on site.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Noel Garland	Wood				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Tristan Truax	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/9/2019
-------------------------------------	--	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	04/02/19 08:30
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	---

Safety suggestions by site workers:	Dust, be aware of heat and stay hydrated.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Travis Stanley	Wood				
Sandy Elder	Tucson Water				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/9/2019
------------------------------	--	----------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	04/02/19 08:06
Field Manager Name:	Samantha Sargent	Site Health and Safety Officer (HSO):	Samantha Sargent
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

- | | |
|--|--|
| <ul style="list-style-type: none"> <input checked="" type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input checked="" type="checkbox"/> Medical Surveillance Requirements <input checked="" type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input checked="" type="checkbox"/> Air Surveillance Type and Frequency <input checked="" type="checkbox"/> Monitoring Instruments and Personal Monitoring <input checked="" type="checkbox"/> Action Levels <input checked="" type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input checked="" type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input checked="" type="checkbox"/> Engineering Controls | <ul style="list-style-type: none"> <input checked="" type="checkbox"/> PPE Required/PPE Used <input checked="" type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input checked="" type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input checked="" type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input checked="" type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input checked="" type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input checked="" type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b) |
|--|--|

Safety suggestions by site workers:	Check fod and reel up slowly. Slips, trips, and falls.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Out Craycoft gate
Other Safety Topics Discussed:	NA
Additional comments:	Be aware of air-traffic

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Samantha Sargent	Wood				
Travis Stanley	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Samantha Sargent	Wood - Tech Prof 3	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 4/9/2019
-------------------------------------	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	04/03/19 06:54
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input checked="" type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
---	---

Safety suggestions by site workers:	Be extra cautious with overhead hazards while hoisting 21' conductor casing.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	New personnel on site: Travis Stanley
Observations of unsafe work practices/conditions that have developed since previous meeting:	None
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	None
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Tristan Truax	YJD				
Gabriel Madge	YJD				
Cody Gabala	YJD				
Travis Stanley	Wood				
Curtis Carlson	YJD				
Charles Odonal	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 4/9/2019
-------------------------------------	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	04/04/19 07:35
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input checked="" type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input checked="" type="checkbox"/> Logs, Reports, Recordkeeping <input checked="" type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input checked="" type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input type="checkbox"/> Hazardous Materials Spill Procedures <input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Use spotters when backing, stay clear of moving vehicles and equipment.
Action taken on previous suggestions:	None
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	More personnel on site, a lot going on, mostly moving and loading equipment today.
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	No changes
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood		Curt Carlson	YJD	
Tristan Truax	YJD		Anthony Burth	YJD	
Gabriel Madge	YJD		Charles odonal	YJD	
Cody Gabala	YJD				
Travis Stanley	Wood				
Matthew Wallendorff	Wood				
Jerry Selvey	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 4/9/2019
-------------------------------------	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	04/05/19 06:15
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Travis Stanley
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Stay hydrated, slips, trips, and falls.
Action taken on previous suggestions:	Discussion
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None observed
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Staging area
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Travis Stanley	Wood				
Curt Carlson	YJD				
Charles Odonal	YJD				
Lauren Baader	Wood				

Meeting Conducted By (print):	Company and Title	Signature
Travis Stanley	Wood - Sr. Field Tech	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/9/2019
-------------------------------------	--	-----------------------------

TAILGATE SAFETY MEETING REPORT



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Date and Time:	4/6/2019 6:45
Field Manager Name:	Lauren Baader	Site Health and Safety Officer (HSO):	Lauren Baader
Safety Meeting Type:	Regular/Daily Tailgate Safety Meeting		

Order of Business

Topics Discussed (check all that apply):

<input type="checkbox"/> Site History/Site Layout <input checked="" type="checkbox"/> Scope of Work <input type="checkbox"/> Personnel Responsibilities <input type="checkbox"/> Medical Surveillance Requirements <input type="checkbox"/> Training Requirements <input checked="" type="checkbox"/> Safe Work Practices <input type="checkbox"/> Logs, Reports, Recordkeeping <input type="checkbox"/> Sanitation and Illumination <input type="checkbox"/> Air Surveillance Type and Frequency <input type="checkbox"/> Monitoring Instruments and Personal Monitoring <input type="checkbox"/> Action Levels <input type="checkbox"/> Accident Reporting Procedures <input checked="" type="checkbox"/> Site Control (visitor access, buddy system, work zones, security, communications) <input type="checkbox"/> Discussion of previous "near misses" including work crew suggestions to correct work practices to avoid similar occurrences <input type="checkbox"/> Engineering Controls	<input type="checkbox"/> PPE Required/PPE Used <input type="checkbox"/> Define PPE Levels, Donning, Doffing Procedures <input type="checkbox"/> Physical Hazards and Controls (e.g., overhead utility lines) <input checked="" type="checkbox"/> Decontamination Procedures for Personnel and Equipment <input type="checkbox"/> General Emergency Procedures (e.g., locations of air horns and what 1 or 2 blasts indicate) <input type="checkbox"/> Site/Regional Emergency Procedures (e.g. earthquake response, typhoon response, etc.) <input checked="" type="checkbox"/> Medical Emergency Response Procedures (e.g., exposure control precautions, location of first aid kit, etc.) <input checked="" type="checkbox"/> Hazardous Materials Spill Procedures <input type="checkbox"/> Applicable SOPs (e.g., Hearing Conservation Program, Safe Driving, etc.) <input type="checkbox"/> Injury/Illness Reporting Procedures <input checked="" type="checkbox"/> Route to Hospital and Medical Care Provider Visit Guidelines <input type="checkbox"/> Hazard Analysis of Work Tasks (chemical, physical, biological and energy health hazards and effects) <input type="checkbox"/> Review AHAs with all parties engaged in the activity (EM-385 1-1, para 01.A.13.b)
--	---

Safety suggestions by site workers:	Safety tie off while sampling from IDW liquid container.
Action taken on previous suggestions:	Discussion
Injuries/accidents/personnel changes since previous meeting:	None
Observations of unsafe work practices/conditions that have developed since previous meeting:	None observed
Location of (or changes in the locations of) evacuation routes/safe refuge areas:	Staging area
Other Safety Topics Discussed:	NA
Additional comments:	None

Attendee signatures below indicate acknowledgment of the information and willingness to abide by the procedures discussed during this safety meeting.

Attendee Name (print)	Company	Signature	Attendee Name (print)	Company	Signature
Lauren Baader	Wood				
Curt Carlson	YJD				
Charles Odonal	YJD				

Meeting Conducted By (print):	Company and Title	Signature
Lauren Baader	Wood - Field Lead	

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/10/2019
-------------------------------------	--	------------------------------

Appendix B-4
Soil Boring/Monitoring Well Records

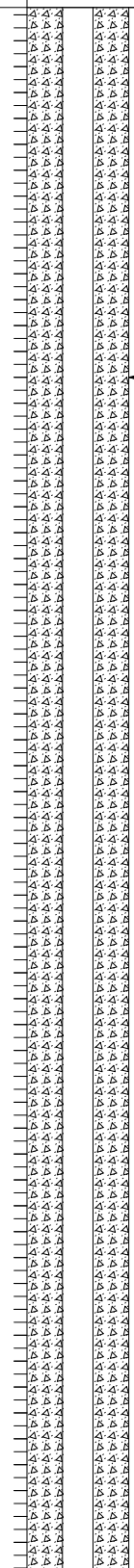
This page intentionally left blank.

PROJECT: Site Inspection of AFFF Davis-Monthan AFB, Tucson, AZ		Log of Well No. MW03002	
BORING LOCATION: N: 436436.02 E:1014244.521		GROUND SURFACE ELEVATION AND DATUM: 2551.876 NAD88	
DRILLING CONTRACTOR: Yellow Jacket Drilling		DATE STARTED: 3/4/19	DATE FINISHED: 3/12/19
DRILLING METHOD: RotoSonic		TOTAL DEPTH (ft.): 455.0	SCREEN INTERVAL (ft.): 434.96 - 454.4
DRILLING EQUIPMENT: Sonic L1706		DEPTH TO WATER ATD (ft): 293	CASING: 4" dia., Sch. 80 PVC
SAMPLING METHOD: RotoSonic		LOGGED BY: L. Baader	
HAMMER WEIGHT: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: S. Schneider	REG. NO. PG9471

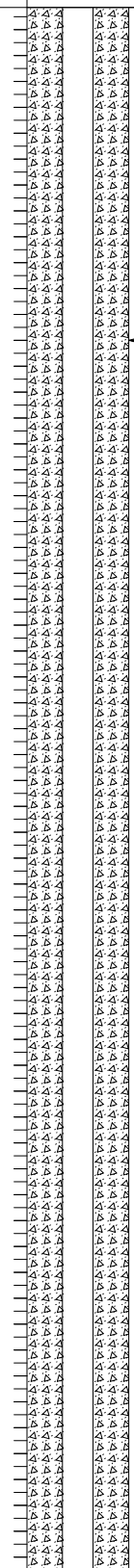
DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
					Surface Elevation: 2551.876 NAD88	
5				10.4	CLAYEY SAND (SC): brown (7.5YR 5/4), moist, ~80% fine to coarse sand, ~20% fines brown (7.5YR 5/3), dry, ~70% sand, ~30% fines, weakly cemented, strong HCL reaction ~60% sand, ~40% fines, very weakly cemented	12-inch diameter borehole with 8-inch steel conductor casing, cement annulus, Sch. 80 PVC well casing
10					light brown (7.5YR 6/3), ~70% sand, ~30% fines weakly cemented ~60% sand, ~40% fines	
15				10.6	~80% sand, ~20% fines brown (7.5YR 5/4), ~60% sand, ~40% fines	
20					LEAN CLAY with SAND (CL): brown (7.5YR 5/4), dry, ~80% fines, ~20% sand, medium plasticity, weakly cemented	
25				11.1		
30					CLAYEY SAND (SC): light reddish brown (5YR 6/4), ~70% fine sand, ~30% fines, low plasticity	
35				5.7		9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
40					LEAN CLAY with SAND (CL): reddish brown (5YR 5/4), dry, ~80% fines, ~20% fine sand	
45				8.7		
50						

WELL 10

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
55				2.4	CLAYEY SAND (SC): reddish brown (5YR 5/4), dry, ~70% fine sand, ~30% fines, weakly cemented	<p>9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
					LEAN CLAY with SAND (CL): ~75% fines, ~25% fine sand	
					CLAYEY SAND (SC): ~70% fine to coarse sand, ~30% fines, weakly cemented	
60						
65				6.6		
70					~65% sand, ~35% fines cobble 5-6" diameter	
					SILTY SAND (SM): light brown (7.5YR 6/3), dry, ~80% fine to coarse sand subrounded/subangular, ~20% fines	
75				9.4		
					WELL-GRADED SAND (SW): light brown (7.5YR 6/3), dry, ~95% fine to coarse sand subrounded/subangular, ~5% fines	
80					CLAYEY SAND (SC): pink (7.5YR 7/3), dry, ~75% fine to medium sand, ~25% fines	
					gray (7.5YR6/1)	
85				11.0		
					reddish brown (5YR 6/4) nodules	
90					CLAY lens, reddish gray (5YR 5/2)	
					WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), dry, ~90% fine to medium sand, ~10% fines	
95				9.1		
					CLAYEY SAND (SC): brown (7.5YR 4/3), ~75% fine to medium sand, ~25% fines, weakly cemented nodules	
100					WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), ~90% fine to coarse sand, ~10% fines	
105				4.7		
					LEAN CLAY with SAND (CL): light brown (7.5YR 6/3), ~85% fines, ~15% fine to medium sand,	
110						

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
115				8.4	medium plasticity, no dilatancy, medium toughness, medium dry strength, compact, weakly cemented	 <p>9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
120						
125				4.6	LEAN CLAY (CL): light brown (7.5YR 6/3), ~95% fines, trace fine sand, medium plasticity, no dilatancy, medium toughness, medium dry strength, compact	
130					CLAYEY SAND (SC): brown (7.5YR 5/4), ~75% fine to coarse sand, ~25% fines	
135					pulverized cobbles increased fines ~30-35%, weakly cemented	
140				2.7	CLAYEY SAND with GRAVEL (SC): pinkish gray (7.5YR 6/2), ~60% fine to coarse sand, ~25% fines, ~15% fine to coarse gravel, subangular	
145				4.6		
150					POORLY-GRADED SAND with SILT (SP-SM): pinkish gray (7.5YR 6/2), moist, ~90% fine to medium sand, ~10% fines	
155				1.1	CLAYEY SAND lens SILTY SAND (SM): pinkish gray (7.5YR 6/2), moist, ~85% fine to medium sand, ~15% fines	
160					CLAYEY SAND lens	
165				0.1	LEAN CLAY (CL): brown (7.5YR 5/3), dry, ~95% fines, medium plasticity, no dilatancy, medium toughness, medium dry strength	
170					CLAYEY SAND (SC): brown (7.5YR 5/4), dry, ~75% fine to medium sand, ~25% fines, weakly cemented	

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
175				1.0	CLAYEY SAND (SC): continued WELL-GRADED SAND with CLAY (SW-SC): brown (7.5YR 5/3), ~90% fine to coarse sand, ~10% fines	9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
180					CLAYEY SAND (SC): brown (7.5YR 5/2), dry, ~80% fine to coarse sand, ~20% fines	
185				2.0	GRAVEL cobble lens WELL-GRADED SAND with SILT (SW-SM): brown (7.5YR 5/4), dry to moist, ~90% fine to coarse sand, subrounded/subangular, ~10% fines	8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
190					CLAYEY SAND (SC): brown (7.5YR 5/4), dry, ~70% fine to coarse sand, ~30% fines	
195				1.1	GRAVEL/cobble lens ~80% sand, ~20% fines GRAVEL lens Large cobbles	
200					WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): brown (7.5YR 5/3), dry, ~70% fine to coarse sand, ~20% subangular fine to coarse gravel, ~10% fines	
205				0.1	SILTY SAND with GRAVEL (SM): pinkish gray (7.5YR 7/2), ~60% fine to coarse sand, ~20% subangular fine to coarse gravel, ~20% fines Cobbles	
210					CLAYEY SAND (SC): brown (7.5YR 5/4), dry, ~80% fine to coarse sand, ~20% fines	
215				0.7	SILTY SAND (SM): brown (7.5YR 5/2), dry, ~80% fine to coarse sand, ~20% fines LEAN CLAY with SAND lens moist	
220					CLAYEY SAND (SC): brown (7.5YR 5/2), dry, ~80% fine to coarse sand, ~20% fines	
225				0.3	SILTY SAND (SM): brown (7.5YR 5/4), moist, ~80% fine to coarse sand, subrounded/subangular, ~20% fines	
230					CLAYEY SAND (SC): brown (7.5YR 4/2), dry, ~70% fine to coarse sand, ~30% fines	

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
235				0.2	~80% sand, ~20% fines	 <p>8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
240					WELL-GRADED SAND with SILT and GRAVEL (SP-SM): pinkish gray (7.5YR 7/2), dry, ~70% fine to coarse sand, ~20% gravel, ~10% fines	
245				0.4	Pulverized rock	
250						
255				0.8	CLAYEY SAND (SC): brown (7.5YR 5/3), dry, ~75% fine to medium sand, ~25% fines	
260					WELL-GRADED SAND with SILT and GRAVEL lens	
265					CLAYEY SAND with GRAVEL (SC): light brown (7.5YR 6/4), ~60% fine to coarse sand, ~20% fines, ~20% fine gravel, weakly cemented nodules	
270				1.8	WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), dry, ~90% fine to coarse sand, ~10% fines	
275					CLAYEY SAND with GRAVEL (SC): dry, ~60% fine to coarse sand, ~20% fines, ~20% fine gravel	
280				0.8	Weakly cemented nodules	
285					Pulverized large cobbles moist	
290				1.5	SILTY SAND (SM): light brown (7.5YR 6/3), dry, ~75% fine to coarse sand, ~15% fines, ~10% pea-sized gravel, weakly cemented nodules throughout	
					SANDY LEAN CLAY (CL): light brown (7.5YR 6/3), ~80% fines, ~20% fine to coarse sand, medium plasticity, no dilatancy, medium toughness, medium dry strength	

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
295				0.2	SANDY LEAN CLAY (CL): continued Saturated Dry, ~70% fines, ~30% sand	<p>8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
300					CLAYEY SAND (SC): light reddish brown (2.5YR 6/3), dry, ~70% fine to coarse sand, ~20% fines, ~10% fine to coarse gravel	
305				NR	LEAN CLAY with SAND (CL): light brown (7.5YR 6/3), ~80% fines, ~20% fine to coarse sand, medium plasticity, no dilatancy, medium toughness, medium dry strength	
310					CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~75% fine to coarse sand, ~25% fines Cobbles	
315				0.0	SANDY LEAN CLAY (CL): light brown (7.5YR 6/3), ~70% fines, ~30% fine to coarse sand, medium plasticity, no dilatancy, medium toughness, medium dry strength No recovery.	
320						
325				0.0	CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~65% fine to medium sand, ~25% fines, ~10% fine gravel, weakly cemented nodules	
330					SANDY LEAN CLAY (CL): light brown (7.5YR 6/3), moist, ~70% fines, ~20% fine to coarse sand, ~10% fine gravel, medium plasticity, no dilatancy, medium toughness, medium dry strength	
335				0.0	CLAYEY SAND (SC): pinkish gray (7.5YR 6/2), ~75% fine to coarse sand, ~25% fines Saturated Moist CLAY lens	
340					~85% sand, ~15% fines	
345				0.0	Manganese oxide staining	
350					LEAN CLAY with SAND (CL): light brown (7.5YR 6/4), moist, ~80% fines, ~20% fine to coarse sand, medium plasticity, no dilatancy, medium toughness, medium dry strength CLAYEY SAND (SC): pinkish gray (7.5YR 6/2),	

DAVIS03-GW-002 (duplicate)

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
355				0.0	moist, ~70% fine to coarse sand, 30% fines Wet/ Saturated	<p>8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
360						
365				0.0	Very consistent through 366'	
370					LEAN CLAY with SAND (CL): pinkish gray (7.5YR 6/2), moist, ~80% fines, ~20% fine to medium sand, low plasticity, no dilatancy, medium toughness, medium dry strength, very compact	
375				0.3	CLAYEY SAND (SC): brown (7.5YR 5/2), moist, ~75% fine to coarse sand, ~25% fines	
380					LEAN CLAY with SAND (CL): light brown (7.5YR 6/3), moist to dry, ~80% fines, ~20% fine to medium sand, medium plasticity, no dilatancy, medium toughness, medium dry strength, very compact	
385				0.4	CLAYEY SAND (SC): light brown (7.5YR 6/3), moist, ~65% fine to coarse sand, ~25% fines, ~10% fine gravel lense of fine sand/fines	
390					LEAN CLAY with SAND (CL): light brown (7.5YR 6/3), moist to dry, ~80% fines, ~20% fine to medium sand, medium plasticity, no dilatancy, medium toughness, medium dry strength, extremely compact	
395				0.3	CLAYEY SAND (SC): pink (7.5YR 7/3), moist, ~75% fine to coarse sand, ~15% fines, ~10% fine gravel LEAN CLAY with SAND (CL): light brown (7.5YR 6/4), moist to dry, ~80% fines, ~20% fine sand, medium plasticity, no dilatancy, medium toughness, medium dry strength	
400					CLAYEY SAND (SC): light brown (7.5YR 6/4), moist, ~60% fine to coarse sand, ~40% fines, very compact, low moisture	
405				1.0	SC Nodules Clay content decreased to ~30%	
410					Manganese oxide staining 6-inch thick Clay with Sand Lense	

DAVIS03-GW-003

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
415				1.3	cementation increased, dry 3-inch thick clay lens	8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
420					SILTY SAND (SM): light brown (7.5YR 6/3), moist, ~65% fine to medium sand, ~35% fines	
425				1.1	CLAYEY SAND (SC): brown (7.5YR 5/3), dry to moist, ~90% clay, ~10% fine sand, medium plasticity, no dilatancy, medium toughness, medium dry strength, hard consistency	
430					SILT with SAND (ML): light brown (7.5YR 6/3), moist, ~80% silt (some clay), ~20% fine sand, low plasticity, slow dilatancy, low toughness, low dry strength, soft consistency	8-inch diameter borehole, bentonite annulus, Sch. 80 PVC well casing
435				1.7	SILTY SAND (SM): light brown (7.5YR 6/3), moist, ~70% fine to medium sand, ~30% silt	8-inch diameter borehole, filter pack, Sch. 80 PVC well screen
440					Coarse sand content increased, moisture increase (moist to wet)	
445				0.8	CLAYEY SAND (SC): light brown (7.5YR 6/3), moist, ~65% fine to coarse sand, ~35% fines	8-inch diameter borehole, filter pack, Sch. 80 PVC well screen
450					Fine to medium sand, increase fines to ~40%	
455				1.0	SILTY SAND (SM): pink (7.5YR 7/3), moist, ~65% fine to coarse sand, ~35% silt	
460					SILT content decreased to ~20%, wet soil, increase coarse sand	
465					SILT with SAND (SC): light brown (7.5YR 6/3), moist to dry, ~80% fines, 20% fine sand, some clay content, low plasticity, slow dilatancy, low toughness, low dry strength, firm consistency	
470					End of Boring; MW03002 installed.	
475						

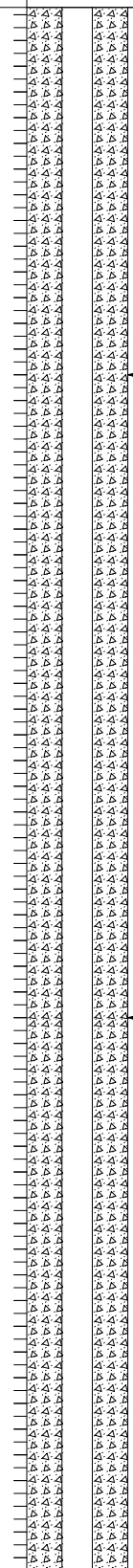
PROJECT: Site Inspection of AFFF Davis-Monthan AFB, Tucson, AZ		Log of Well No. MW03003	
BORING LOCATION: N:436402.689 E:1013212.234		GROUND SURFACE ELEVATION AND DATUM: 2547.331 NAD88	
DRILLING CONTRACTOR: Yellow Jacket Drilling		DATE STARTED: 3/21/19	DATE FINISHED: 4/3/19
DRILLING METHOD: RotoSonic		TOTAL DEPTH (ft.): 462.0	SCREEN INTERVAL (ft.): 430.49 - 449.58
DRILLING EQUIPMENT: Sonic L1706		DEPTH TO WATER ATD (ft): 286	CASING: 4" dia., Sch. 80 PVC
SAMPLING METHOD: RotoSonic		LOGGED BY: L. Baader	
HAMMER WEIGHT: NA	DROP: NA	RESPONSIBLE PROFESSIONAL: S. Schneider	REG. NO. PG9471

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
					Surface Elevation: 2547.331 NAD88	
5				2.5	CLAYEY SAND (SC): brown (7.5YR 5/3), dry, ~60% fine to coarse sand, ~30% fines, ~10% fine gravel, some weakly cemented nodules, loose	12-inch diameter borehole with 8-inch steel conductor casing, cement annulus, Sch. 80 PVC well casing
10				1.7	LEAN CLAY (CL): light brown (7.5YR 6/3), dry, ~85% fines, ~15% fine sand, low plasticity, no dilatancy, low toughness, low dry strength, loose, weakly cemented nodules	
15				3.2		
20				1.7		
25						
30						
35				0.4	SILTY SAND (SM): brown (7.5YR 5/3), dry, ~60% fine sand, ~25% silt, ~15% clay, loose, a few strongly cemented nodules	9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
40						
45				0.6	Increase sand to ~70%, fine to coarse	
50						

WELL10

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample Blows/ 6 Inches				
55					SILTY SAND (SM): continued	
60			1.2		WELL-GRADED SAND with SILT (SW-SM): light brown (7.5YR 6/3), dry, ~85% fine to coarse sand, ~15% silt, loose	
65					POORLY-GRADED SAND with CLAY (SP-SC): brown (7.5YR 5/2), ~75% fine to medium sand, ~25% fines, weakly cemented nodules abundant	
70			3.8		WELL-GRADED SAND with CLAY (SW-SC): brown (7.5YR 5/4), moist, ~80% fine to coarse sand, ~15% fines, ~5% fine gravel, loose	
75					Pulverized rock (cobbles)	
80			0.8		WELL-GRADED SAND (SW): pink (7.5YR 7/3), dry, ~90% fine to coarse sand, ~5% fines, ~5% fine gravel, loose, non-reactive with HCl	
85					WELL-GRADED SAND with SILT (SW-SM): pink (7.5YR 7/3), dry, ~80% fine to coarse sand, ~20% fines, loose, pulverized cobbles	
90			15.9		SILT with SAND (ML): light brown (7.5YR 6/3), dry, ~60% fines, ~20% fine to medium sand, ~10% fine gravel, low plasticity, no dilatancy, low toughness, low dry strength, loose	
95					Lens of WELL-GRADED SAND	
100					WELL-GRADED SAND with SILT (SW-SM): pinkish gray (7.5YR 6/2), dry, ~80% fine to coarse sand, ~10% fines, ~10% fine gravel, angular/ subangular, loose	
105					Increase fines ~20%, more clay content	
110			15.5		SANDY LEAN CLAY (CL): brown (7.5YR 5/3), ~70% fines, ~30% fine to medium sand, low plasticity, no dilatancy, low toughness, low dry strength, compact, weakly cemented nodules	
					WELL-GRADED SAND with SILT (SW-SM): brown (7.5YR 5/3), dry, ~90% fine to coarse sand, ~10% fines, loose	
			1.4		SANDY LEAN CLAY (CL): brown (7.5YR 5/4), dry, ~60% fines, ~40% fine to medium sand, low plasticity, no dilatancy, low toughness, low dry strength, weakly cemented nodules, reacts weak with HCL - turned green after effervescence	
					WELL-GRADED SAND with SILT (SW-SM): brown	

← 9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample Blows/ 6 Inches				
115				3.0	(7.5YR 5/3), dry, ~90% fine to coarse sand, ~10% fines, loose LEAN CLAY (CL): light brown (7.5YR 6/3), moist, ~90% fines, high clay with some silt content, low plasticity, no dilatancy, low toughness, low dry strength, compacted nodules	 <p>9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing</p>
120					WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): light brown (7.5YR 6/3), dry, ~75% fine to coarse sand, ~15% fines, ~10% fine gravel, loose, weakly cemented nodules	
125				1.2	LEAN CLAY with SAND (CL): dry, ~80% fines, ~20% fine to coarse sand, low plasticity, slow dilatancy, low toughness, low dry strength, loose	
130					WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), dry, ~20% fines, ~80% fine to coarse sand, weakly cemented nodules	
135				0.1	LEAN CLAY with SAND (CL): dry, ~80% fines, ~20% fine to coarse sand, low plasticity, slow dilatancy, low toughness, low dry strength, loose	
140					WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), ~70% coarse sands, ~30% fines, calcium carbonate abundant lens LEAN CLAY with SAND	
145				0.0	SILTY SAND with GRAVEL (SM): ~70% fine sand, ~20% fines, ~10% fine gravel	
150					LEAN CLAY (CL): reddish brown (5YR 5/4), ~80% clay, ~10% fine sand, ~10% silt	
155				0.7	CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~70% fine to medium sand, ~25% fines, ~5% fine gravel, loose	
160					WELL-GRADED SAND (SW): light brown (7.5YR 6/3), dry, ~90% fine to coarse sand, ~5% fines, ~5% fine gravel, subangular, loose	
165				0.3	LEAN CLAY (CL): traces of moisture, ~80% clay, ~20% silt, medium plasticity, slow dilatancy, low toughness, low dry strength Cobbles	
170					WELL-GRADED SAND with GRAVEL (SW): pink (7.5YR 7/3), ~80% fine to coarse sand, ~20% fine gravel	
					CLAYEY SAND with GRAVEL (SC): light brown (7.5YR 6/3), dry, ~60% fine to medium sand, ~30% fines, ~10% gravel, loose	
					Cobbles	
					CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~70% fine to coarse sand, ~30% fines, loose	

9-inch diameter borehole, grout annulus, Sch. 80 PVC well casing

8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
175					WELL-GRADED SAND with GRAVEL (SW): light brown (7.5YR 6/3), dry, ~80% fine to coarse sand, ~20% subangular gravel	
180					SANDY LEAN CLAY with GRAVEL (CL): brown (7.5YR 5/3), dry, ~60% fines, ~30% fine to coarse sand, ~10% fine gravel, subangular, loose	
185				2.5	CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~70% fine to coarse sand, ~30% fines, loose lens of LEAN CLAY	
190					WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/3), dry, ~90% fine to coarse sand, ~10% fines, loose lens of LEAN CLAY	
195				4.8	CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~70% fine to coarse sand, ~30% fines (~20% clay/~10% silt), loose brown (7.5 YR 6/2), ~75% fine to medium sand, ~20% fines, ~10% gravel	
200					SANDY LEAN CLAY (CL): brown (7.5YR 6/2), dry, ~50% fines, ~40% fine to coarse sand, ~10% fine gravel, subangular, low plasticity, no dilatancy, low toughness, low dry strength, weakly cemented, nodules abundant	
205				2.7	CLAYEY SAND (SC): dry, ~70% fine to coarse sand, ~30% fines, weakly cemented, coliche observed at 194' increased cementation (calcium veins) observed in nodules	
210					CLAYEY SAND with GRAVEL (SC): ~60% fine to coarse sand, ~20% fines, ~20% gravel, weakly cemented nodules, calcium carbonate veination abundant Cobbles - large core of rock observed	
215				1.0	CLAYEY SAND (SC): ~65% fine to medium sand, ~35% fines, weakly cemented, coliche observed at 194' increased cementation (calcium veins) observed in nodules	
220					SANDY LEAN CLAY (CL): brown (7.5YR 5/4), dry, ~70% fines, ~30% fine to medium sand, low plasticity, no dilatancy, medium toughness, medium dry strength	
225				2.1	WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/4), dry, ~75% medium to coarse sand, ~20% fines, ~5% gravel	
230					CLAYEY SAND (SC): light reddish brown (7.5YR 6/4), dry, ~65% medium to coarse sand, ~30% fines, ~5% gravel	

← 8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
235				0.9	WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/4), ~80% sand, ~20% fines	
240					CLAYEY SAND (SC): light brown (7.5YR 6/4), ~70% fine to coarse well graded sand, ~30% fines weakly cemented nodules	
245				1.0	CLAYEY SAND with GRAVEL (SC): pink (7.5YR 7/3), ~70% fine to coarse sand, ~15% fines, ~15% fine to coarse gravel Cobbles, pulverized rock	
250						
255				2.1	WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): pink (7.5YR 7/3), dry, ~60% fine to coarse sand, ~15% fines, ~25% fine to coarse gravel, weakly cemented nodules, loose Cobbles fines have some silt content	
260						
265				3.5	CLAYEY SAND (SC): light brown (7.5YR 6/3), dry, ~70% fine to medium sand, ~30% fines, low silt content in fines, predominately clay, weakly cemented nodules	
270					WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): pink (7.5YR 7/3), ~60% fine to coarse sand, ~15% fines, ~25% fine to coarse gravel, weakly cemented nodules, loose Cobbles	
275				2.4	WELL-GRADED SAND with SILT (SW-SM): light brown (7.5YR 6/3), dry, ~90% fine to coarse sand, ~10% fines	
280					WELL-GRADED SAND (SW): dry, ~95% fine to coarse sand, ~5% fines, few weakly cemented nodules	
285				0.9	WELL-GRADED SAND with GRAVEL (SW): dry, ~85% fine to coarse sand, ~15% subangular gravel, loose	
290					WELL-GRADED SAND with CLAY (SC): ~90% medium to coarse sand, ~10% fines moist wet	

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
295	DAVIS03-GW-004			0.6	SILT lens 6-inch thick, moist	8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
					SILTY SAND (SM): wet, ~70% fine sand, ~30% silt	
	WELL-GRADED SAND with SILT (SW-SM):, ~85% medium to coarse sand, ~10% fines, ~5% fine gravel					
300	WELL-GRADED SAND (SW): light brown (7.5YR 6/3), wet, ~90% coarse sand, ~10% fines					
305	0.8	CLAYEY SAND (SC): light brown (7.5YR 6/4), wet, ~80% fine to coarse sand, ~20% fines, predominately clay				
310	cobbles, ~65% fine sand, ~35% fines					
315	2.4	WELL-GRADED SAND (SW): light brown (7.5YR 6/3), ~95% fine to coarse sand, primarily fine sand, ~5% fines (clay)				
320	SILTY SAND (SM): light brown (7.5YR 6/3), ~65% fine sand, ~35% fines (silt), no dilatancy, medium toughness, compact, tight					
	Cobbles					
325	5.6	CLAYEY SAND (SC): light brown (7.5YR 6/4), moist, ~75% fine to medium sand, ~25% fines (clay), low silt content, no dilatancy, medium toughness, compact, tight				
330	CLAYEY SAND (SC): brown (7.5YR 5/3), moist, ~60% fine to medium sand, ~40% fines (clay)					
	Cobbles; lens of medium sand 6-inches thick					
335	1.1	SILTY SAND (SM): light brown (7.5YR 6/4), wet, ~60% fine sand, ~40% fines				
340	CLAYEY SAND (SC): light brown (7.5YR 6/3), wet, ~65% fine to medium sand, ~30% clay with trace silts, ~5% gravel					
345	1.2	WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/4), wet, ~85% fine to coarse sand, ~10% fines (clay), ~5% fine gravel				
350	medium to coarse sand					

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
355				1.4	fine sand increased	
360					WELL-GRADED SAND with GRAVEL (SW): light brown (7.5YR 6/4), wet, ~70% fine to coarse sand, ~25% fine to coarse gravel, ~5% fines	
365				0.4	SILTY SAND with GRAVEL (SM): light brown (7.5YR 6/4), ~60% fine to medium sand, ~30% fines, ~10% coarse gravel	
370					SILTY SAND (SM): light brown (7.5YR 6/4), ~70% fine to coarse sand, ~30% fines	
375					CLAYEY SAND (SC): light brown (7.5YR 6/4), ~80% medium to coarse sand, ~20% fines Cobbles	
380				1.5	WELL-GRADED SAND (SW): wet, medium to coarse sand	
385					CLAYEY SAND (SC): light brown (7.5YR 6/3), moist to dry, ~65% fine to coarse sand, ~30% fines, ~5% fine gravel, tightly packed	
390					CLAYEY SAND with GRAVEL (SC): light brown (7.5YR 6/4), moist to wet, ~60% fine to medium sand, ~25% fines, ~15% coarse gravel, tightly compact at 376-378	
395				3.2	CLAYEY SAND (SC): light brown (7.5YR 6/4), ~70% fine to medium sand, ~30% fines, trace gravel, compact	
400				0.7	SANDY LEAN CLAY (CL): brown (7.5YR 5/4), moist, ~60% clay, low plasticity, no dilatancy, medium toughness, low dry strength, tightly compact	
405					SILTY SAND (SM): light brown (7.5YR 6/3), wet, ~65% fine sand, ~30% fines, ~5% fine gravel	
410					CLAYEY SAND (SC): light brown (7.5YR 6/4), ~70% fine to medium sand, ~30% fines, manganese staining at 391	
				18.7	WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): light brown (7.5YR 6/4), wet, ~70% fine to coarse sand, ~10% fines, ~10% fine to coarse gravel	
					CLAYEY SAND (SC): brown (7.5YR 5/4), ~70% fine to medium sand, ~30% fines, some silt content in fines, very tightly compacted, gray staining observed at 402, caliche at 403	
					dark staining ~85% fine to coarse sand, ~20% fines, Loose, moist to wet	

← 8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing

DAVIS03-GW-006

DEPTH (feet)	SAMPLES			PID Reading (ppm)	DESCRIPTION NAME (USCS): color, moist, % by wt., plasticity, dilatancy, toughness, dry strength, consistency	WELL CONSTRUCTION DETAILS AND/OR DRILLING REMARKS
	Sample No.	Sample	Blows/ 6 Inches			
415				0.4	Cementation observed at 415, reacts with HCL LEAN CLAY with SAND (CL): light brown (7.5YR 6/3), dry, ~80% fines, medium plasticity, slow dilatancy, medium toughness, high dry strength, tightly compact	8-inch diameter borehole, grout annulus, Sch. 80 PVC well casing
420					CLAYEY SAND (SC): light brown (7.5YR 6/3), moist, ~70% fine to medium sand, ~30% fines, slightly compact	8-inch diameter borehole, bentonite annulus, Sch. 80 PVC well casing
425				2.7	SILTY SAND (SM): light brown (7.5YR 6/3), moist, ~60% fine sand, ~40% fines, slightly compact	
430					CLAYEY SAND (SC): light brown (7.5YR 6/3), moist, ~80% fine to medium sand, ~20% fines (clay), trace silt	8-inch diameter borehole, filter pack, Sch. 80 PVC well screen
435				2.1	WELL-GRADED SAND (SW): wet, fine to coarse sand WELL-GRADED SAND with CLAY (SW-SC): light brown (7.5YR 6/4), dry to moist, ~90% fine to medium sand, ~10% fines	
440					WELL-GRADED SAND with CLAY and GRAVEL (SW-SC): light brown (7.5YR 6/3), wet, ~80% fine to coarse sand, ~10% fines, ~10% fine to coarse gravel, loose	8-inch diameter borehole, filter pack, Sch. 80 PVC well screen
445				2.8	CLAYEY SAND (SC): light brown (7.5YR 6/3), ~80% fine to medium sand, ~15% fines, slightly compact	
450					SANDY SILT (ML): light brown (7.5YR 6/3), moist, ~60% fines, ~40% fine to medium sand, low plasticity, low-no dilatancy, low toughness, low dry strength, very compact	
455				4.0	CLAYEY SAND (SC): light brown (7.5YR 6/3), moist, ~80% fine to coarse sand, ~20% fines	
460					SILTY SAND (SM): light brown (7.5YR 6/3), ~70% fine to medium sand, ~30% fines	
465				0.8	CLAYEY SAND (SC): light brown (7.5YR 6/3), ~65% fine to coarse sand, ~30% fines, ~5% gravel SILTY SAND (SM): light brown (7.5YR 6/3), ~70% fine to medium sand, ~30% fines	
470					End of Boring; MW03003	



FIELD WELL CONSTRUCTION SYMMARY WELL CASING INSTALLATION

Well ID: MW03002

Project No: 775303101

I. Section Measurements: (to 0.01 of a foot)

Well casing sections (A)

44	x	10.04			

Total = 441.76 (1)

Well screen sections (B)

2	x	10.02			
---	---	-------	--	--	--

Total = 20.04 (2)

Length from top of screen section to top of perforation

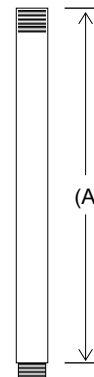
(C) = 0.2 (3)

Length from bottom of screen section to bottom perforation

(D) = 0.4 (4)

Length of Bottom End Cap + Tailpipe (Measured Inside of Cap)

(E) = 0.2 (5)



II. Total Measurements Referenced to GS: (to 0.01 of a foot)

Total length of well casing

(1+2+5) = 462 (6)

Total length of perforated interval

(2-3-4) = 19.44 (7)

Temporary height/depth of top of casing AGS (+) / BGS (-)

(1) Desired depth to top of screen interval 435 (8a) (1+3-8a) = 6.96 (9a)

or (2) Desired depth to bottom of screen interval 455 (8b) (1+3+7-8b) = 6.4 (9b)

Actual height/depth of top of casing after installation (to 0.01 of a foot) 7 (9c)

Total depth of well (BGS) (to 0.10 of a foot) (6-9c) = 455 (10)

Depth of perforated interval (BGS) (to 0.10 of a foot) Bottom (10-5-4) = 454.4 (11)

Top (11-7) = 434.96



III. Surface Completion (to 0.10 of a foot)

Top of casing adjustments: Casing removed (-) / added (+)

 -4.1 Total = 4.1 (12)

Final TOC: AGS (+) / BGS (-) (9c-12) = 2.9 (13)

Total Depth of Well below TOC (to 0.10 of a foot) (6-12) = 457.9 (14)

Depth of Perforated Interval below (TOC) (to 0.10 of a foot) Bottom (14-5-4) = 457.3 (15)

Top (15-7) = 437.86

Note: All measurements of well casing and screen sections to be to the nearest 0.01 ft. All final measurements referenced to ground surface and top of casing are to be to the nearest 0.10 ft.

GS = ground surface AGS = above ground surface BGS = below ground surface TOC = top of casing



FIELD WELL CONSTRUCTION SUMMARY ANNULAR MATERIALS VOLUME CALCULATIONS WORKSHEET

Project: DMAFB Follow-on SI **Date:** 3/14/2019
Location: Tucson, Arizona **Project/Task No:** 775303101
Well I.D.: MW03002

Filter Pack Volume Calculations (Filter Pack and Transition Seal)

Filter Pack/Granular Transition Seal Description (Brand and Gradation)	Bottom Depth (feet)	Top Depth (feet)	Total Length of Filter Pack Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	ft3 of Sand per Linear Foot of Annulus	Total Volume of Filter Pack (cubic feet)	Calculated Number of 50 lb. Bags of Sand Required	Number of 50 lb. Bags of Sand Used
12-20 Silica Sand (Pioneer)	455	431	24	8"	4"	14.66	351.45	12.56	12

Annular Seal Volume Calculations (Bentonite Seal)

Bentonite Seal Description	Bottom Depth (feet)	Top Depth (feet)	Length of Bentonite Seal Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	ft3. of Bentonite Chips/Pellets per Linear Foot of Annulus	Total Volume of Bentonite Seal (cubic feet)	Calculated Number of 50 lb. Bags/Pails of Bentonite Required	Number of 50 lb. Bags/Pails of Bentonite Used
Pel-Plug 1/4" Coated Pellets	431	422.9	8.1	8"	4"	14.66	118.74	3	3

Annular Seal Volume Calculations (cement/bentonite grout, neat cement grout, bentonite grout, sand-cement grout, etc.)

See attached **GROUTING FORM** for detailed grout slurry data.

Annular Seal Description (Include Cement Type -- e.g., I, II, V)	Bottom Depth (feet)	Top Depth (feet)	Length of Annular Seal Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	Calculated Total Volume of Grout for Annular Seal (gallons or ft ³ or yd ³ -- circle one)	Total Volume of Grout Used in Annular Seal (gallons or ft ³ or yd ³ -- circle one)
Phoenix Cement, Portland Type I, II, V/Bentonite slurry 5%	422.9	196	226.9	8"	4"	444.18 gallons	600 gallons
	196	20	176	9"	4"	466.56 gallons	690 gallons

Miscellaneous Data and Conversions

1 gallon water = 8.34 pounds 1 cubic foot water = 7.48 gallons water 1 sack of sand = 1 cubic foot and approximately 100 pounds 1 pail of bentonite pellets = approximately 50 pounds
 1 cubic foot water = 62.4 pounds 1 sack of cement (wet) = 0.5 cubic foot = 3.75 gallons 1 sack of cement (dry) = 1 cubic foot and approximately 96 pounds



FIELD WELL CONSTRUCTION SUMMARY GROUTING FORM

Project Name: DMAFB Follow-on SI Project No.: 775303101
 Site Name: AFFF Area 3 Date: 3/14/2019 - 3/20/2019
 Location: Tucson, Arizona Well/Boring ID: MW03002

Batch Number	TIME			BATCH MIXTURE					BATCH VOLUME		CUMULATIVE VOLUME				
	Begin Mixing	End Mixing	End Pumping	# Sacks Cement	Water (gallons)	Bentonite (lbs)	Sand (lbs)	Grout Weight (lbs/gal)	cu. ft.	gallons	cu. ft.	gallons	Calculated Grout Level (ft bgs)	Measured Grout Level (ft bgs)	Tremie Pipe Depth (ft bgs)
1	10:00	10:15	10:25	12	40	25	N/A		8	60	8	60			
2	10:25	10:30	10:40	12	40	25	N/A		8	60	16	120			
3	10:40	10:48	10:55	12	40	25	N/A		8	60	24	180			
4	10:55	11:03	11:10	12	40	25	N/A		8	60	32	240	302.9	300	290
5	16:00	16:10	16:15	12	40	25	N/A		8	60	40	300			
6	16:15	16:22	16:29	12	40	25	N/A		8	60	48	360			
7	16:29	16:35	16:42	12	40	25	N/A		8	60	56	420			
8	16:47	16:50	16:55	12	40	25	N/A		8	60	64	480	180	200	190
9	9:00	9:05	9:12	12	40	25	N/A		8	60	72	540			
10	9:15	9:20	9:26	12	40	25	N/A		8	60	80	600			
11	9:27	9:32	9:45	12	40	25	N/A		8	60	88	660			
12	9:48	9:55	10:05	12	40	25	N/A		8	60	96	720	80	160	150
13	13:15	13:22	13:29	12	40	25	N/A		8	60	104	780			
14	13:30	13:36	13:41	12	40	25	N/A		8	60	112	840			
15	13:42	13:47	13:51	12	40	25	N/A		8	60	120	900			
16	13:51	13:58	14:02	12	40	25	N/A		8	60	128	960			
17	14:05	14:08	14:17	12	40	25	N/A		8	60	136	1020	60	92	90
18	14:30	14:35	17:44	12	40	25	N/A		8	60	144	1080			
19	14:00	14:52	14:56	12	40	25	N/A		8	60	152	1140			
20	14:58	15:05	15:13	12	40	25	N/A		8	60	160	1200		44	40
21	10:15	10:23	10:28	12	40	25	N/A		8	60	168	1260		48	40
22	10:30	10:35	10:42	6	20	11.5	N/A		4	30	172	1290	20	20	--



FIELD WELL CONSTRUCTION SUMMARY

Well ID: MW03003 Project Name: DMAFB Follow-on SI
 Project No.: 775303101 Location: Tucson, Arizona
 Amec Personnel: N. Garland, L. Baader

DRILLING SUMMARY

Drilling Contractor: Yellow Jacket Drilling Driller: Tristan Truax
 Drilling Method: Sonic Drill Rig: #131
 Drilling Fluid: None Drill Bit(s): 7" Core Barrel

BORING AND WELL CASING DEPTH MEASUREMENTS

Pilot Boring:	Depth Interval BGS	<u>0-20'</u>	Diameter	<u>12"</u>	Depth Interval BGS	<u>20-150'</u>	Diameter	<u>9"</u>
Reamed Boring:	Depth Interval BGS	<u>150-452'</u>	Diameter	<u>8"</u>	Depth Interval BGS	<u>462</u>	Diameter	<u>7"</u>
Depth of Perforated Interval BGS:		<u>430.49 - 449.58</u>						
Depth of Perforated Interval Below TOC:		<u>433.16 - 452.25</u>						
Total Depth BGS of Well Casing:						<u>450.18</u>		
Total Depth of Well Below TOC:						<u>452.85</u>		

WELL DESIGN Geologic Log Geophysical Log

Codes: B = Bentonite Seal C = Casing CC = Conductor Casing
 CL = Centralizer EC = End Cap F = Filter G = Grout
 N = Native Fill S = Screen TS = Transition Seal

CONSTRUCTION TIME LOG

Casing/Screen			Annular Materials			Task	Start		Finish				
							Date	Time	Date	Time			
20	-	0-20	CC	20	-	0-20	Cement	Drilling	3/21/2019	9:45	3/27/2019	13:00	
430	-	0-430	C	398	-	20-418	G	Casing	3/27/2019	16:33	3/27/2019	17:20	
20	-	430-450	S	8	-	418-426	B	Filter	3/27/2019	17:28	3/27/2019	18:05	
0.15	-	-450.15	EC	26	-	426-452	F						
-	-			-	-			Seal	3/27/2019	19:15	3/27/2019	19:35	
-	-			-	-								
-	-			-	-								
-	-			-	-								
-	-			-	-								
-	-			-	-			Grout	3/28/2019	9:30	4/2/2019	17:48	
-	-			-	-			Other					

Filter Material: 12-20 Silica Sand

Seal (B/TS): Bentonite 1/4" coated chips

Grout: 5% Bentonite-cement slurry

Native Material: N/A

Surface Finish: 3.5' Monument, protective bollards

Centralizers: N/A

Other: N/A

Well Casing:
 C1 4"-Diameter schedule 80 PVC riser
 C2 N/A
Well Screen:
 S1 4"-Diameter 0.020" slotted schedule 80 PVC screen
 S2 N/A
 Conductor CC1 0-20' 8"-Diameter steel casing
 Casing: CC2 N/A

QA/QC'd by: _____ Date: _____



FIELD WELL CONSTRUCTION SYMMARY WELL CASING INSTALLATION

Well ID: MW03003

Project No: 775303101

I. Section Measurements: (to 0.01 of a foot)

Well casing sections (A)

43	x	10.04			
1	x	5.02			

Total = 436.74 (1)

Well screen sections (B)

2	x	10.07			
---	---	-------	--	--	--

Total = 20.14 (2)

Length from top of screen section to top of perforation

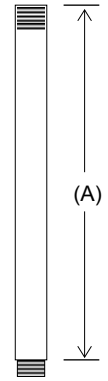
(C) = 0.3 (3)

Length from bottom of screen section to bottom perforation

(D) = 0.3 (4)

Length of Bottom End Cap + Tailpipe (Measured Inside of Cap)

(E) = 0.15 (5)



II. Total Measurements Referenced to GS: (to 0.01 of a foot)

Total length of well casing

(1+2+5) = 457.03 (6)

Total length of perforated interval

(2-3-4) = 19.54 (7)

Temporary height/depth of top of casing AGS (+) / BGS (-)

(1) Desired depth to top of screen interval 430 (8a) (1+3-8a) = 7.04 (9a)

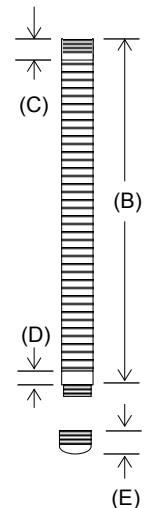
or (2) Desired depth to bottom of screen interval 450 (8b) (1+3+7-8b) = 6.58 (9b)

Actual height/depth of top of casing after installation (to 0.01 of a foot) 6.55 (9c)

Total depth of well (BGS) (to 0.10 of a foot) (6-9c) = 450.03 (10)

Depth of perforated interval (BGS) (to 0.10 of a foot) Bottom (10-5-4) = 449.58 (11)

Top (11-7) = 430.49



III. Surface Completion (to 0.10 of a foot)

Top of casing adjustments: Casing removed (-) / added (+)

 -3.88 Total = 3.88 (12)

Final TOC: AGS (+) / BGS (-) (9c-12) = 2.67 (13)

Total Depth of Well below TOC (to 0.10 of a foot) (6-12) = 453.15 (14)

Depth of Perforated Interval below (TOC) (to 0.10 of a foot) Bottom (14-5-4) = 452.7 (15)

Top (15-7) = 433.16

Note: All measurements of well casing and screen sections to be to the nearest 0.01 ft. All final measurements referenced to ground surface and top of casing are to be to the nearest 0.10 ft.

GS = ground surface AGS = above ground surface BGS = below ground surface TOC = top of casing



FIELD WELL CONSTRUCTION SUMMARY ANNULAR MATERIALS VOLUME CALCULATIONS WORKSHEET

Project: DMAFB Follow-on SI **Date:** 3/28/2019 - 4/2/2019
Location: Tucson, Arizona **Project/Task No:** 775303101
Well I.D.: MW03003

Filter Pack Volume Calculations (Filter Pack and Transition Seal)

Filter Pack/Granular Transition Seal Description (Brand and Gradation)	Bottom Depth (feet)	Top Depth (feet)	Total Length of Filter Pack Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	ft ³ . of Sand per Linear Foot of Annulus	Total Volume of Filter Pack (cubic feet)	Calculated Number of 50 lb. Bags of Sand Required	Number of 50 lb. Bags of Sand Used
12-20 Silica Sand (Pioneer)	452	426	26	8"	4"	14.66	381.23	14	14

Annular Seal Volume Calculations (Bentonite Seal)

Bentonite Seal Description	Bottom Depth (feet)	Top Depth (feet)	Length of Bentonite Seal Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	ft ³ . of Bentonite Chips/Pellets per Linear Foot of Annulus	Total Volume of Bentonite Seal (cubic feet)	Calculated Number of 50 lb. Bags/Pails of Bentonite Required	Number of 50 lb. Bags/Pails of Bentonite Used
Pel-Plug 1/4" Coated Pellets	426	418	8	8"	4"	14.66	117.28	3	3

Annular Seal Volume Calculations (cement/bentonite grout, neat cement grout, bentonite grout, sand-cement grout, etc.)

See attached **GROUTING FORM** for detailed grout slurry data.

Annular Seal Description (Include Cement Type -- e.g., I, II, V)	Bottom Depth (feet)	Top Depth (feet)	Length of Annular Seal Interval (feet)	Borehole Diameter (inches)	Casing Diameter (inches)	Calculated Total Volume of Grout for Annular Seal (gallons or ft ³ or yd ³ -- circle one)	Total Volume of Grout Used in Annular Seal (gallons or ft ³ or yd ³ -- circle one)
Phoenix Cement, Portland Type I, II, V-Bentonite Slurry 5%	418	147	271	8"	4"	530.51 gallons	600 gallons
	147	20	127	9"	4"	336.66 gallons	540 gallons

Miscellaneous Data and Conversions

1 gallon water = 8.34 pounds 1 cubic foot water = 7.48 gallons water 1 sack of sand = 1 cubic foot and approximately 100 pounds 1 pail of bentonite pellets = approximately 50 pounds
 1 cubic foot water = 62.4 pounds 1 sack of cement (wet) = 0.5 cubic foot = 3.75 gallons 1 sack of cement (dry) = 1 cubic foot and approximately 96 pounds



FIELD WELL CONSTRUCTION SUMMARY GROUTING FORM

Project Name: DMAFB Follow-on SI
 Site Name: AFFF Area 3
 Location: Tucson, Arizona

Project No.: 775303101
 Date: 3/21/2019 - 4/2/2019
 Well/Boring ID: MW03003

Batch Number	TIME			BATCH MIXTURE					BATCH VOLUME		CUMULATIVE VOLUME				
	Begin Mixing	End Mixing	End Pumping	# Sacks Cement	Water (gallons)	Bentonite (lbs)	Sand (lbs)	Grout Weight (lbs/gal)	cu. ft.	gallons	cu. ft.	gallons	Calculated Grout Level (ft bgs)	Measured Grout Level (ft bgs)	Tremie Pipe Depth (ft bgs)
1	9:30			12	40	25	N/A		8	60	8	60			
2				12	40	25	N/A		8	60	16	120			
3				12	40	25	N/A		8	60	24	180			
4				12	40	25	N/A		8	60	32	240			
5				12	40	25	N/A		8	60	40	300			
6			11:05	12	40	25	N/A		8	60	48	360	280	280	--
7	10:15	10:20	10:24	12	40	25	N/A		8	60	56	420			
8	10:26	10:33	10:38	12	40	25	N/A		8	60	64	480			
9	10:40	10:47	10:56	12	40	25	N/A		8	60	72	540			
10	11:00	11:08	11:15	12	40	25	N/A		8	60	80	600	180	198	170
11	16:45	16:58	17:03	12	40	25	N/A		8	60	88	660			
12	17:05	17:12	17:18	12	40	25	N/A		8	60	96	720			
13	17:19	17:27	17:33	12	40	25	N/A		8	60	104	780			
14	17:35	17:42	17:56	12	40	25	N/A		8	60	112	840	80	92	70
15	8:50	9:00	9:12	12	40	25	N/A		8	60	120	900			
16	9:12	9:18	9:25	12	40	25	N/A		8	60	128	960		52	
17	11:40	11:55	12:01	12	40	25	N/A		8	60	136	1020			
18	12:04	12:10	12:15	12	40	25	N/A		8	60	144	1080			
19	12:18	12:24	12:30	12	40	25	N/A		8	60		1140		20	
20	12:32	12:38	12:42	10	-	0	N/A		-	-	-	-			
21	13:00	13:19	13:26	8	-	0	N/A		-	-	-	-			

Appendix B-5
Well Development Forms

This page intentionally left blank.

This page intentionally left blank.

Appendix B-6
Water Quality Sampling Instrument Calibration Forms

This page intentionally left blank.

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027 Task Order: 0004	Date: 03/07/19
Installation: DAVIS - Davis-Monthan AFB	Calibration Start Time: 10:28
Sample Technician(s): Lauren Baader	Calibration End Time: 11:40

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (ms/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/07/19	10:28	28.37	4.0	9.13	1.000	7.62	NA	306	763.02	Initial calibration
			7.0	20.1						
				103						
			10.0	784						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (ms/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/07/19	11:37	28.37	4.01	10	1.001	7.99	NA	238	763.02	No weather change
			7.0	20						
				100						
			10.07	800						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	UEBU5004-C	10/01/20	Spec. Conductance	UECS1000-C	11/01/19	10	A221	08/07/20
pH (7)	UEBU5007-C	10/20/20	Salinity	NA	NA	20	A7086	03/19/19
pH (10)	UEBU5010-C	10/01/20	D.O.	NA	NA	100	A7194	07/07/19
			ORP	9GA444	10/07/19	800	A7062	03/07/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%;"> <tr> <th style="width: 60%;">Manufacturer/Model</th> <th style="width: 40%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: <p style="text-align: center;">No salinity calibration solution</p>	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	131000028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/15/2019
-------------------------------------	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027	Task Order: 0004
Installation: DAVIS - Davis-Monthan AFB	Date: 03/09/19
Sample Technician(s): Lauren Baader	Calibration Start Time: 08:20
	Calibration End Time: 08:45

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/09/19	08:20	24.0	4.06	9.4	1.372	89.2	NA	160	762.00	Used different conductivity solution: new lot number noted
			6.76	19.6						
				104						
			10.33	798						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/09/19	08:45	24.0	3.98	10	1.001	100.1	NA	237.9	762.00	No weather changes during calibration.
			7	20						
				100						
			10.03	800						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GJ999	10/31/20	Spec. Conductance	8GH834	08/30/19	10	A8221	08/09/20
pH (7)	8GJ877	10/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	8GJ1015	10/31/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	3/9/2019

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;">Manufacturer/Model</th> <th style="width: 70%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>13100C028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	13100C028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: No salinity measurements, no calibration fluid for salinity. No DO solution - calibrated with atm pressure and potable water in cal cup	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	13100C028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/15/2019
-------------------------------------	--	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027 Task Order: 0004	Date: 03/10/19
Installation: DAVIS - Davis-Monthan AFB	Calibration Start Time: 07:20
Sample Technician(s): Lauren Baader	Calibration End Time: 08:01

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/10/19	07:20	24.8	3.97	10	0.955	99.8	NA	236.9	758.08	None.
			6.96	19.7						
				104						
			10.27	738						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/10/19	08:01	24.8	3.99	10	1.001	100.02	NA	237.5	758.08	No weather change during cal
			7.00	20.2						
				100						
			10.00	738						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	10/30/19	10	A8221	08/09/20
pH (7)	UEBU5007-P	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	UEBU5010-P	04/30/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%;"> <tr> <th style="width: 50%;">Manufacturer/Model</th> <th style="width: 50%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> </table> Calibrated Within Acceptance Criteria (Y/N): Yes If No, Provide Explanation: NA	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Notes: No salinity measurements, not calibrated. No solution used to cal DO, used atm pressure	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No							
Water Quality Meter: YSI 556 MPS	03L0931AB							
Turbidity Meter: Hach 2100Q	131000028843							

QA/QC'd by: Thomas W. Hensel 	QA/QC Date: 3/18/2019
---	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027	Task Order: 0004
Installation: DAVIS - Davis-Monthan AFB	Date: 03/11/19
Sample Technician(s): Lauren Baader	Calibration Start Time: 08:20
	Calibration End Time: 09:09

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/11/19	08:20	14.08	3.98	9.39	0.967	101.4	NA	228.7	757.53	NA
			6.84	20.3						
			10.30	100						
				723						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/11/19	09:09	14.08	3.99	10	1.001	99.9	NA	238.2	757.53	No weather changes during cal
			7.02	20						
			10.05	100						
				800						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	10/30/19	10	A8221	08/09/20
pH (7)	8GJ877	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	UEBU5010-P	10/31/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%;"> <tr> <th style="width: 60%;">Manufacturer/Model</th> <th>Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: <p style="text-align: center; color: blue;">No salinity measurements, not calibrated. No solution used to cal DO, used atm pressure.</p>	Signature: <div style="text-align: center; font-size: 2em;"> </div> Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	131000028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by: Thomas W. Hensel	<i>Thomas W. Hensel</i>	QA/QC Date: 3/18/2019
-------------------------------------	-------------------------	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Calibration Start Time:	14:44
Sample Technician(s):	L. Baader, N. Garland	Calibration End Time:	15:02

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/24/19	14:44	30.14	4.07	9.82	1.151	96.8	No cal	224.0	759.71	None
			6.87	19.5						
			10.04	98.3						
				803						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/24/19	15:02	30.14	4.0	9.89	1.000	98.1	No cal	238.0	759.71	No change in weather during calibration.
			7.0	19.5						
			10.01	99.0						
				802						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	08/30/20	10	A8221	08/31/20
pH (7)	8GE250	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	8GD929	04/30/20	D.O.	NA	NA	100	A7194	07/31/19
			ORP	9GA444	10/31/20	800	A7062	03/31/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Manufacturer/Model</th> <th style="width: 50%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: <p style="text-align: center; color: blue;">No salinity calibration. No zero solution used for DO calibration.</p>	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	131000028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by:	Thomas W. Hensel		QA/QC Date:	3/27/2019
--------------------	------------------	--	--------------------	-----------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027 Task Order: 0004	Date: 03/25/19
Installation: DAVIS - Davis-Monthan AFB	Calibration Start Time: 08:15
Sample Technician(s): L. Baader, N. Garland	Calibration End Time: 08:45

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/25/19	08:15	24	3.98	9.71	0.951	96.5	NA	252.7	764.46	None
			7.06	20.3						
			10.10	104						
				822						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/25/19	08:45	24	4.0	9.83	1.000	100.7	NA	238.0	764.46	No change in weather during calibration.
			7.00	20.2						
			10.01	98.1						
				798						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	08/30/20	10	A8221	08/31/20
pH (7)	8GE250	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	8GD929	04/30/20	D.O.	NA	NA	100	A7194	07/31/19
			ORP	9GA444	10/31/20	800	A7062	03/31/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%;"> <tr> <th style="width: 60%;">Manufacturer/Model</th> <th style="width: 40%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: <p style="text-align: center; color: blue;">No salinity calibration. No zero solution used for DO calibration.</p>	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	131000028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 3/27/2019
-------------------------------------	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027 Task Order: 0004	Date: 03/26/19
Installation: DAVIS - Davis-Monthan AFB	Calibration Start Time: 07:15
Sample Technician(s): L. Baader, N. Garland	Calibration End Time: 07:30

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/26/19	07:15	28.4	4.02	9.95	1.003	10.4	NA	238.2	763	None
			6.96	19.5						
				97						
			10.08	796						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
03/26/19	07:30	28.4	4.00	10	1.000	10.23	NA	238.0	763	No change in weather during calibration.
			7.00	20.5						
				102						
			10.01	807						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	08/30/20	10	A8221	08/31/20
pH (7)	8GE250	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	8GD929	04/30/20	D.O.	NA	NA	100	A7194	07/31/19
			ORP	9GA444	10/31/20	800	A7062	03/31/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%;">Manufacturer/Model</th> <th style="width: 50%;">Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td>Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td>NA</td> </tr> </table>	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes	If No, Provide Explanation:	NA	Notes: <p style="text-align: center; color: blue;">No salinity calibration. No zero solution used for DO calibration.</p>	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No											
Water Quality Meter: YSI 556 MPS	03L0931AB											
Turbidity Meter: Hach 2100Q	131000028843											
Calibrated Within Acceptance Criteria (Y/N):	Yes											
If No, Provide Explanation:	NA											

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 3/27/2019
-------------------------------------	--	------------------------------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide **Project Number:** 775303101.DMF001.0300
Contract: FA8903-16-D-0027 **Task Order:** 0004 **Date:** 04/03/19
Installation: DAVIS - Davis-Monthan AFB **Calibration Start Time:** 07:12
Sample Technician(s): Lauren Baader **Calibration End Time:** 07:45

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/03/19	07:12	18.2	4.01	9.36	1.002	79.8	NA	246.4	760.73	None
			7.03	20.8						
				99						
			10.02	783						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/03/19	07:15	18.2	4.0	10.01	1.000	100	NA	238	760.73	No weather change during calibration
			7.00	20						
				100						
			10	800.01						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	10/30/19	10	A8221	08/09/20
pH (7)	8GJ877	05/31/20	Salinity	NA	04/03/19	20	A7086	03/31/19
pH (10)	UEBU5010-P	10/31/20	D.O.	NA	04/03/19	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 30%;"></th> <th style="width: 35%;">Manufacturer/Model</th> <th style="width: 35%;">Serial No</th> </tr> <tr> <td>Water Quality Meter:</td> <td>YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter:</td> <td>Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td colspan="2" style="text-align: center;">Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td colspan="2" style="text-align: center;">NA</td> </tr> </table>				Manufacturer/Model	Serial No	Water Quality Meter:	YSI 556 MPS	03L0931AB	Turbidity Meter:	Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes		If No, Provide Explanation:	NA		Notes: No salinity measurements, not calibrated. No solution used to cal DO, used atm pressure	Signature: Name (print): Lauren Baader
	Manufacturer/Model	Serial No																	
Water Quality Meter:	YSI 556 MPS	03L0931AB																	
Turbidity Meter:	Hach 2100Q	131000028843																	
Calibrated Within Acceptance Criteria (Y/N):	Yes																		
If No, Provide Explanation:	NA																		

QA/QC'd by: Thomas W. Hensel *Thomas W. Hensel* **QA/QC Date:** 4/9/2019

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Calibration Start Time:	07:12
Sample Technician(s):	Lauren Baader	Calibration End Time:	07:45

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/04/19	07:12	27.48	3.99	9.61	1.109	8.98	NA	246.3	762.887	None
			6.97	19.8						
				98.7						
			10.05	785						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (mg/L)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/04/19	07:45	27.48	4.00	10.1	1.001	10.1	NA	237.9	762.887	No weather changes occurred during calibration.
			7.00	19.9						
				100.1						
			10.01	797						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	10/30/19	10	A8221	08/09/20
pH (7)	8GJ877	05/31/20	Salinity	NA	NA	20	A7086	03/31/20
pH (10)	UEBU5010-P	10/31/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.):			Notes:	Signature:
	Manufacturer/Model	Serial No		
Water Quality Meter:	YSI 556 MPS	03L0931AB		
Turbidity Meter:	Hach 2100Q	131000028843		
Calibrated Within Acceptance Criteria (Y/N):	Yes			
If No, Provide Explanation:	NA			

QA/QC'd by:	Thomas W. Hensel <i>Thomas W. Hensel</i>	QA/QC Date:	4/9/2019
-------------	--	-------------	----------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name:	Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number:	775303101.DMF001.0300
Contract:	FA8903-16-D-0027	Task Order:	0004
Installation:	DAVIS - Davis-Monthan AFB	Calibration Start Time:	09:30
Sample Technician(s):	Lauren Baader	Calibration End Time:	10:02

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/05/19	09:30	16.37	4.05	9.54	1.159	98.3	NA	242.8	758.98	None
			6.98	20.5						
				98.3						
			10.01	805						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/05/19	10:02	16.37	4.00	9.69	1.001	99.9	NA	238.0	758.98	No weather changes during calibration
			7.00	20.3						
				98.3						
			10.00	798						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GE424	05/31/20	Spec. Conductance	8GH834	10/30/19	10	A8221	08/09/20
pH (7)	8GJ877	05/31/20	Salinity	NA	NA	20	A7086	03/31/19
pH (10)	UEBU5010-P	10/31/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%;"> <tr> <th style="width: 15%;"></th> <th style="width: 35%;">Manufacturer/Model</th> <th style="width: 50%;">Serial No</th> </tr> <tr> <td>Water Quality Meter:</td> <td>YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter:</td> <td>Hach 2100Q</td> <td>131000028843</td> </tr> <tr> <td>Calibrated Within Acceptance Criteria (Y/N):</td> <td colspan="2">Yes</td> </tr> <tr> <td>If No, Provide Explanation:</td> <td colspan="2">NA</td> </tr> </table>		Manufacturer/Model	Serial No	Water Quality Meter:	YSI 556 MPS	03L0931AB	Turbidity Meter:	Hach 2100Q	131000028843	Calibrated Within Acceptance Criteria (Y/N):	Yes		If No, Provide Explanation:	NA		Notes: No salinity measurements, not calibrated. No solution used to cal DO, used atm pressure	Signature: Name (print): Lauren Baader
	Manufacturer/Model	Serial No															
Water Quality Meter:	YSI 556 MPS	03L0931AB															
Turbidity Meter:	Hach 2100Q	131000028843															
Calibrated Within Acceptance Criteria (Y/N):	Yes																
If No, Provide Explanation:	NA																

QA/QC'd by:	Thomas W. Hensel	QA/QC Date:	4/9/2019
--------------------	------------------	--------------------	----------

WATER QUALITY SAMPLING INSTRUMENT CALIBRATION FORM



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027 Task Order: 0004	Date: 04/06/19
Installation: DAVIS - Davis-Monthan AFB	Calibration Start Time: 08:00
Sample Technician(s): Lauren Baader	Calibration End Time: 08:30

Readings Before Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/06/19	08:00	19.17	3.98	9.74	1.110	93.6	NA	240.9	760.487	None
			7.32	20.4						
				97						
			9.76	782						

Readings After Calibration

Date	Time (24hr)	Temperature (°C)	pH (SU)	Turbidity (NTUs)	Specific Electrical Conductance (mS/cm)	D.O. (%)	Salinity (%)	ORP/Eh (mV)	Barometric Pressure (mm Hg)	Comments
04/06/19	08:30	19.17	4.03	9.93	1.020	100.1	NA	238.9	760.487	No changes in weather during cal
			7.01	20.3						
				98						
			9.89	790						

Calibration Materials Record:

pH Calibration Standards			Specific Electrical Conductance, Salinity, Dissolved Oxygen (DO) and Oxidation Reduction Potential (ORP) Calibration Standards			Turbidity Standards		
Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date	Standard	Cal. Standard Lot #	Expiration Date
pH (4)	8GJ999	10/31/20	Spec. Conductance	8G1673	09/30/19	10	A8221	08/09/20
pH (7)	8GJ877	10/31/20	Salinity	NA	NA	20	A7086	03/31/20
pH (10)	8GJ1015	10/31/20	D.O.	NA	NA	100	A7194	07/09/19
			ORP	9GA444	10/31/19	800	A7062	03/09/19

Instruments (Manufacturer, Model, and Serial No.): <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 60%;">Manufacturer/Model</th> <th>Serial No</th> </tr> <tr> <td>Water Quality Meter: YSI 556 MPS</td> <td>03L0931AB</td> </tr> <tr> <td>Turbidity Meter: Hach 2100Q</td> <td>131000028843</td> </tr> </table> Calibrated Within Acceptance Criteria (Y/N): Yes If No, Provide Explanation: NA	Manufacturer/Model	Serial No	Water Quality Meter: YSI 556 MPS	03L0931AB	Turbidity Meter: Hach 2100Q	131000028843	Notes: No salinity measurements, not calibrated. No solution used to cal DO, used atm pressure	Signature: Name (print): Lauren Baader
Manufacturer/Model	Serial No							
Water Quality Meter: YSI 556 MPS	03L0931AB							
Turbidity Meter: Hach 2100Q	131000028843							

QA/QC'd by: Thomas W. Hensel		QA/QC Date: 4/9/2019
-------------------------------------	--	-----------------------------

This page intentionally left blank.

Appendix B-7
Groundwater Sampling Records

This page intentionally left blank.

GROUNDWATER SAMPLING RECORD



Project Name: Site Inspection of AFFF Release Areas Environmental Programs Worldwide	Project Number: 775303101.DMF001.0300
Contract: FA8903-16-D-0027	Task Order: 0004
Installation: DAVIS - Davis-Monthan AFB	Technician(s): Lauren Baader
Well ID: MW03002	Date: 04/06/19
Initial Depth to Water (ft): 291.72	Well Diameter (in): 4.0
Total Depth of Well (ft): 457.9	1 Casing Volume (gal): 109.0
Method of Purging: Grundfos pump	3 Casing Volumes (gal): 327.0
Measuring Point (toc, tor, etc.): Top of Riser	Pump Intake Depth (feet): 444.5' BTOC

Time	Water Level (feet)	Flow Rate (gpm)	Cum. Volume (gal.)	Temp. (°C)	pH (SU)	Specific Electrical Conductance (mS/cm)	DO (mg/L)	ORP (mV)	Turbidity (NTU)	Comments/Observations During Purging (color, sediment, odor, etc.)
Stabilization Criteria				±0.5°C	±0.1	±3%	±10%	±10%	±10% and <10 NTU	
09:30		5.5								Pumping/Purging Started
09:45	325.83	5.5	82.5	26.55	7.27	0.413	3.19	-168.50	>>>	
09:55	339.50	5.5	137.5	27.18	7.07	0.400	4.55	-163.50	54.40	
10:05	341.80	5.5	192.5	28.07	6.34	0.397	5.23	-151.90	15.60	
10:15	342.40	5.5	247.5	27.99	6.52	0.395	5.85	-148.90	7.53	
10:25	342.60	5.5	302.5	27.84	6.39	0.395	5.60	-149.10	5.21	
10:35	342.85	5.5	357.5	27.66	6.14	0.394	5.84	-147.60	2.53	
10:45	342.89	5.5	412.5	27.69	6.14	0.395	5.84	-145.50	3.29	
10:55	342.90	5.5	467.5	27.34	5.54	0.392	5.86	-144.90	1.95	
11:05	343.12	5.5	522.5	27.47	5.83	0.391	5.89	-143.40	1.66	
11:15	343.20	5.5	577.5	28.17	5.17	0.393	5.90	-143.80	2.04	
11:25	343.31	5.5	632.5	27.70	5.13	0.389	5.88	-142.90	1.95	
11:35	343.33	5.5	687.5	28.10	5.15	0.393	6.00	-143.10	2.17	
11:45	343.38	5.5	742.5	27.83	5.16	0.393	5.93	-142.70	1.39	

Stability Reached (Y/N): Yes If No, Provide Explanation NA

Final Values:	27.83	5.16	0.393	5.93	-142.7	1.39
----------------------	-------	------	-------	------	--------	------

Sample ID: DAVIS03-GW-008	Method of Sampling: Grundfos pump
QA/QC Samples (Yes/No): No	Sample Date: 04/06/19
Duplicate ID: NA	Sample Collection Time: 11:55
Sample Container Type(s): 250 mL HDPE	Total Volume Purged (gal): 742.5
Preservative(s): Ice (4 °C)	Sample Depth (ft): 444.5
Analysis/Method(s): PFAS (EPA 537-modified) + FTS List	Depth to Water After Sampling (ft): 343.4

Instruments (Manufacturer, Model, and Serial No.):
 Equipment Calibrated (Y/N): Yes Calibrated Within Criteria (Y/N): Yes

Turbidity Meter, Water Quality Meter, Grundfos Pump
Hach 2100Q 131000028843, YSI 556 MPS 03L0931AB

<p>Calculations:</p> <p>Saturated well casing volume: $V = \pi(R^2)H \cdot 7.48 \text{ gal/ft}^3$</p> <p>$V = \text{Volume (gal/ft)}$ $\pi = 3.14$ $R = \text{well radius (ft)} = (\text{well diameter (in)}/12 \text{ (in/ft)})/2$ $H = \text{height of water column (ft)}$</p> <p style="text-align: right; font-size: small;"> $V = \pi(R^2)H \cdot 7.48 \text{ gal/ft}^3$ $= \pi * (4.0 \text{ (in)}/12 \text{ (in/ft)})/2^2 * 166.18 * 7.48 \text{ gal/ft}^3$ $= 109.0 \text{ gal.}$ </p>	<p>Signature:</p>
---	--------------------------

Notes: <div style="text-align: center;">None</div>	Name (print): Lauren Baader
--	---

QA/QC'd by: Thomas W. Hensel	QA/QC Date: 4/9/2019
-------------------------------------	-----------------------------

This page intentionally left blank.

Appendix C
Laboratory Analytical Reports (DVD)

This page intentionally left blank.

Appendix D
Data Validation Reports

This page intentionally left blank.

DATA VALIDATION REPORT
SITE INSPECTION OF AQUEOUS FILM FORMING FOAM (AFFF) RELEASE AREAS
ENVIRONMENTAL PROGRAMS WORLDWIDE
DAVIS-MONTHAN AIR FORCE BASE

Samples Collected Between 7 March and 6 April 2019

Prepared for:
Air Force Civil Engineer Center
Joint Base San Antonio – Lackland, Texas



Prepared by:



Contract FA8903-16-D-0027

Task Order 0004

May 2019

This page intentionally left blank

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	DATA VALIDATION METHODOLOGY	3
3.0	EXPLANATION OF DATA QUALITY INDICATORS.....	5
3.1	Laboratory Control Sample Recoveries	5
3.2	Matrix Spike Recoveries	5
3.3	Blank Concentrations	5
3.4	Laboratory and Field Duplicates.....	5
4.0	DEFINITIONS OF QUALIFIERS THAT MAY BE USED DURING DATA VALIDATION	7
5.0	QUALIFICATION REASON CODES	9
6.0	CHAIN OF CUSTODY AND SAMPLE RECEIPT CONDITION DOCUMENTATION	11
7.0	SPECIFIC DATA VALIDATION FINDINGS	13
7.1	Per- and Polyfluoroalkyl substances by Modified EPA Method 537	13
7.1.1	Holding Times.....	13
7.1.2	Initial Calibrations.....	13
7.1.3	Initial Calibration Verification	13
7.1.4	Continuing Calibration Verification	13
7.1.5	Laboratory Blanks.....	13
7.1.6	Field and Equipment Blanks	13
7.1.7	Laboratory Control Sample Accuracy.....	14
7.1.8	Matrix Spikes/ Matrix Spike Duplicates	14
7.1.9	Laboratory Duplicates	14
7.1.10	Surrogate Recoveries	15
7.1.11	Internal Standard Recoveries	15
7.1.12	Data Reporting and Analytical Procedures	15
8.0	FIELD DUPLICATE RESULTS	17
9.0	SUMMARY AND CONCLUSIONS.....	19
	REFERENCES.....	21

LIST OF TABLES

Table 1	Field Samples Submitted to SGS North America Inc.
Table 2	Field Duplicate Detections
Table 3	Qualifiers Added During Validation

This page intentionally left blank

ACRONYMS AND ABBREVIATIONS

µg/L	Micrograms per Liter
%	Percent
6:2 FTS	6:2 Fluorotelomer Sulfonate
8:2 FTS	8:2 Fluorotelomer Sulfonate
AFFF	Aqueous Film Forming Foam
Amec Foster Wheeler	Amec Foster Wheeler Environment & Infrastructure, Inc.
CCV	Continuing Calibration Verification
COC	Chain Of Custody
DL	Detection Limit
DoD	Department Of Defense
EPA	United States Environmental Protection Agency
EtFOSAA	Ethyl Perfluorooctanesulfonamide
ICV	Initial Calibration Verification
ID	Identification
IDW	Investigation Derived Waste
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOQ	Limit Of Quantification
MeFOSAA	Methyl Perfluorooctanesulfonamide
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PFAS	Per- And Polyfluoroalkyl Substances
PFHpA	Perfluoroheptanoic Acid
PFHxA	Perfluorohexanoic Acid
PFHxS	Perfluorohexanesulfonic Acid
PFOS	Perfluorooctanesulfonic Acid
PFNA	Perfluorononanoic Acid

QC	Quality Control
QPP	Quality Program Plan
QSM	Quality Systems Manual
RPD	Relative Percent Difference
SGS	SGS North America Inc.

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, Inc. (Amec Foster Wheeler) collected eight water samples (including one field duplicate), nine equipment blanks, and one field blank between 7 March and 6 April 2019, from Davis-Monthan Air Force Base, located in Tucson, Arizona. Amec Foster Wheeler submitted the samples to SGS North America Inc. (SGS), located in Orlando, Florida, where they were received between 12 March and 9 April 2019. SGS assigned the samples to sample delivery groups FA62248, FA62598, FA62805, and FA63114 and analyzed the samples for per- and polyfluoroalkyl substances (PFAS) by Modified United States Environmental Protection Agency (EPA) Method 537, using the modifications to EPA Method 537 specified in the laboratory's analytical standard operating procedure MS014.3. Additionally, three investigation derived waste (IDW) samples were submitted with sample delivery groups FA62248 and FA62805. The results from the IDW samples were not validated. A list of these samples by field sample identification (ID), sample collection date, sample matrix, and laboratory sample ID is presented in Table 1.

This page intentionally left blank

2.0 DATA VALIDATION METHODOLOGY

Amec Foster Wheeler performed EPA Stage 4 validation on 10 percent (%) of the samples and EPA Stage 2B validation on the remaining samples associated with this sampling event as indicated on Table 1. IDW sample results were not validated. The Stage 4 validation includes review of the quality control (QC) results in the laboratory's analytical report and reported on QC summary forms as well as recalculation checks and review of the instrument raw data outputs. The Stage 2B validation includes review of the QC results in the laboratory's analytical report and reported on QC summary forms with no review of the associated raw data. Data from equipment and field blanks did not undergo validation because results from these samples are only used to assess data usability for field samples. This data validation has been performed in general accordance with:

- Amec Foster Wheeler, 2018. Final (Revision 2), Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas, Environmental Programs Worldwide, Quality Program Plan (QPP), Contract FA8903-16-D-0027, Task Order 0004, October 2018.
- Department of Defense (DoD), 2013. DoD Quality Systems Manual (QSM) for Environmental Laboratories, Version 5.0. July 2013.
- EPA, 2009. Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry, Version 1.1, September 2009. EPA Document #: EPA/600/R-08/092.

The laboratory's certified analytical report and supporting documentation were reviewed to assess the following:

- Data package and electronic data deliverable completeness;
- Laboratory case narrative review;
- Chain of custody (COC) compliance;
- Holding time compliance;
- QC sample frequency;
- Initial calibration, initial calibration verification (ICV), and continuing calibration verification (CCV) compliance with method-specified criteria;
- Presence or absence of laboratory contamination as demonstrated by laboratory blanks;
- Accuracy and bias as demonstrated by recovery of surrogate spikes, laboratory control sample (LCS), and matrix spike (MS) samples;
- Internal standard recoveries;

- Analytical precision as relative percent difference (RPD) of analyte concentration between laboratory duplicates or MS/MS duplicate (MSD);
- Sampling and analytical precision as RPD of analyte concentration between field duplicates;
- Assessment of field contamination as demonstrated by field and equipment blanks;
- Insofar as possible, the degree of conformance to method requirements and good laboratory practices.

In general, it is important to recognize that no analytical data are guaranteed to be correct, even if all QC audits are passed. Strict QC serves to increase confidence in data, but any reported value may potentially contain error.

3.0 EXPLANATION OF DATA QUALITY INDICATORS

Summary explanations of the specific data quality indicators reviewed during this data quality review are presented below.

3.1 LABORATORY CONTROL SAMPLE RECOVERIES

LCSs and LCS duplicates (LCSDs) are aliquots of analyte-free matrices that are spiked with the analytes of interest for an analytical method, or a representative subset of those analytes. The spiked matrix is then processed through the same analytical procedures as the samples they accompany. LCS recovery is an indication of a laboratory's ability to successfully perform an analytical method in an interference-free matrix.

3.2 MATRIX SPIKE RECOVERIES

MSs and MSDs are prepared by adding known amounts of the analytes of interest for an analytical method, or a representative subset of those analytes, to an aliquot of sample. The spiked sample is then processed through the same extraction, concentration, cleanup, and analytical procedures as the unspiked samples in an analytical batch.

MS recovery and precision are an indication of a laboratory's ability to successfully recover an analyte in the matrix of a specific sample or closely related sample matrices. It is important not to apply MS results for any specific sample to other samples without understanding how the sample matrices are related.

3.3 BLANK CONCENTRATIONS

Blank samples are aliquots of analyte free matrix that are used as negative controls to verify that the sample collection, storage, preparation, and analysis system does not produce false positive results.

Equipment blanks are prepared by passing analyte-free water through or over sample collection equipment and collecting the water in sample containers. Equipment blanks are analyzed for the analytical suite required for the project. Equipment blanks are used to monitor for possible sample contamination during the sample collection process and serve as a check on the effectiveness of field decontamination procedures.

Field blanks are prepared by pouring an aliquot of analyte-free water into a sample container in the field. Field blanks are analyzed for the analytical suite required for the project. Field blanks are used to monitor for possible sample contamination originating from the water used for equipment decontamination.

Laboratory, equipment, and field blanks are processed by the laboratory using the same procedures as the field samples. Target analytes should not be found in laboratory blanks.

When target analytes are detected in blanks, analyte concentrations in the associated samples less than 10 times the concentration detected in the blank will be B qualified.

3.4 LABORATORY AND FIELD DUPLICATES

Laboratory and field duplicate analysis verifies acceptable method precision by the laboratory at the time of preparation and analysis and/or sampling precision at the time of collection.

This page intentionally left blank

4.0 DEFINITIONS OF QUALIFIERS THAT MAY BE USED DURING DATA VALIDATION

- B** The analyte was detected in the sample and an associated blank and the concentration detected in the sample was less than 10 times the concentration detected in the blank.
- U** The analyte was analyzed for, but was not detected.
- J** The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.
- Q** The analyte is both B qualified because of blank detection and J qualified because of an additional QC issue.
- UJ** The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.
- R** The sample result is rejected due to serious deficiencies in the ability to analyze the sample and meet quality control criteria. The presence or absence of the analyte cannot be verified.

This page intentionally left blank

5.0 QUALIFICATION REASON CODES

Amec Foster Wheeler applied the following reason code to the data during validation:

- MSL Low MS recovery. Analytical result may be biased low.
- SGH High surrogate recovery. Analytical result may be biased high.
- SGL Low surrogate recovery. Analytical result may be biased low.
- TR Detected concentration is less than the limit of quantification (LOQ).

This page intentionally left blank

6.0 CHAIN OF CUSTODY AND SAMPLE RECEIPT CONDITION DOCUMENTATION

The samples were received at the laboratory under proper COC, intact, properly preserved, and at temperatures less than the QPP-specified maximum of 10 degrees Celsius, with the following exception:

- According to the COC, sample DAVIS-FB-001 was collected on 6 March 2019, however, per instruction from Amec Foster Wheeler, the collection date was changed to 7 March 2019 and data usability is not adversely affected.

This page intentionally left blank

7.0 SPECIFIC DATA VALIDATION FINDINGS

Results from these samples may be considered usable with the limitations and exceptions described in sections 7.1 through 8.0.

7.1 PER- AND POLYFLUOROALKYL SUBSTANCES BY MODIFIED EPA METHOD 537

PFAS results generated by SGS are usable with the limitations described in Sections 7.1.1 through 7.1.12.

7.1.1 Holding Times

The aqueous samples were extracted for PFAS within the QPP-specified maximum holding time of 14 days from sample collection and the extracts were analyzed within the QPP-specified maximum hold time of 28 days from extraction.

7.1.2 Initial Calibrations

The initial calibrations associated with the analysis of these samples met the QPP-specified criteria of correlation coefficients greater than 0.995 and the calibration standards calculating to 70 to 130% (50 to 150% for low-level standards) of their true concentrations.

7.1.3 Initial Calibration Verification

ICV recoveries were within the QPP-specified 70 to 130% limits.

7.1.4 Continuing Calibration Verification

CCV recoveries were within the QPP-specified 70 to 130% limits for mid-level CCVs and 50 to 150% limits for low-level CCVs.

7.1.5 Laboratory Blanks

PFAS were not detected in the laboratory blanks associated with these samples, with the following exception:

- Perfluorononanoic acid (PFNA) was detected at a concentration of 0.00412 micrograms per liter ($\mu\text{g/L}$) in the laboratory blank associated with samples DAVIS03-GW-004 and DAVIS03-GW-005. PFNA was detected in sample DAVIS03-GW-004 at a concentration greater than five times the concentration detected in the blank and PFNA was not detected in sample DAVIS03-GW-005. Data usability is not adversely affected by the blank detection.

7.1.6 Field and Equipment Blanks

Equipment blank DAVIS-EB-033 was not analyzed per instruction from Amec Foster Wheeler.

PFAS were not detected in the field and/or equipment blanks associated with these samples, with the following exceptions:

- Perfluorooctanesulfonic acid (PFOS) was detected at a concentration of 0.00604 $\mu\text{g/L}$ in equipment blank DAVIS-EB-038, associated with sample DAVIS03-GW-007. PFOS was not detected in this sample and data usability is not adversely affected.

- Perfluorooctanoic acid was detected at a concentration of 0.00446 µg/L in the equipment blank DAVIS03-EB-034. DAVIS03-EB-034 is not associated with any of the samples covered in this report and data usability is not adversely affected.

7.1.7 Laboratory Control Sample Accuracy

LCS recoveries were within QPP-specified 70 to 130% limits.

7.1.8 Matrix Spikes/ Matrix Spike Duplicates

SGS performed MS and/or MSD analyses on samples DAVIS03-GW-002, DAVIS03-GW-004, and DAVIS03-GW-007. Recoveries were within the QPP-specified 70 to 130% limits, with the following exceptions:

- Perfluorohexanoic acid (PFHxA [58%]), perfluoroheptanoic acid (PFHpA [65%]), perfluorohexanesulfonic acid (PFHxS [259%]), PFOS (748%), methyl perfluorooctanesulfonamide (MeFOSAA [0%]), ethyl perfluorooctanesulfonamide (EtFOSAA [0%]), 6:2 fluorotelomer sulfonate (6:2 FTS [276%]), and 8:2 fluorotelomer sulfonate (8:2 FTS [0%]) recoveries were outside of specified limits in the MS performed on sample DAVIS03-GW-002. Data limitations are summarized below.
 - PFHxA, PFHpA, PFHxS, PFOS, and 6:2 FTS were detected in the native unspiked sample at concentrations greater than the spike concentrations and it is not possible to assess data usability for these analytes based on MS recoveries.
 - Due to the dilution required to bring analyte concentrations in the native sample into the calibration range, the LOQs for MeFOSAA, EtFOSAA, and 8:2 FTS were greater than the spike concentrations and it is not possible to assess data usability for these analytes in this sample based on MS recoveries.
- Recoveries were between -146% and 67% for all analytes in the MS performed on sample DAVIS03-GW-004. Data limitations are summarized below.
 - Amec Foster Wheeler J qualified the detected PFNA results and UJ qualified the non-detect perfluorodecanoic acid, perfluoroundecanoic acid, perfluorododecanoic acid, perfluorotridecanoic acid, perfluorotetradecanoic acid, MeFOSAA, EtFOSAA, and 8:2 FTS results from this sample due to potential low analytical bias. (Qualifier and reason code: UJ-MSL)
 - The remaining analytes were detected in the native unspiked sample at concentrations greater than the spike concentrations and data usability cannot be evaluated based on the recovery of these analytes in this sample.

7.1.9 Laboratory Duplicates

SGS performed a duplicate analysis on sample DAVIS-FD-GW-002 and DAVIS03-GW-008. RPDs between primary and duplicate results were less than 30% or differences between primary and duplicate results were less than the LOQ, indicating acceptable analytical accuracy.

7.1.10 Surrogate Recoveries

Surrogate recoveries were within the QPP-specified 70 to 130% limits for field samples analyzed at dilutions up to five-fold, with the following exceptions:

- Recoveries of surrogate compound $^{13}\text{C}_2$ -PFDA and d_5 -EtFOSAA were outside of QPP-specified limits at 131% and 69%, respectively, in sample DAVIS03-GW-004; and recoveries of the surrogate compounds $^{13}\text{C}_2$ -PFHxA and d_5 -EtFOSAA were low at 68% and 39% in the 2-fold dilution of this sample. Data limitations are summarized below.
 - Amec Foster Wheeler J qualified the detected PFNA result from sample DAVIS03-GW-004 because of potential high analytical bias. (Qualifier and reason code: J-SGH)
 - Amec Foster Wheeler J qualified the detected 6:2 FTS, and PFHxS results; and UJ qualified the non-detect EtFOSAA and MeFOSAA results from this sample due to potential low analytical bias. (Qualifiers and reason code: J/UJ-SGL)
 - The remaining analytes either were not detected or were reported from analyses that were not associated with the outside-of-limits surrogates, and data usability is not adversely affected.
- Recovery of surrogate compound d_5 -EtFOSAA was low at 45% in sample DAVIS03-GW-005. SGS re-analyzed the sample with a recovery inside of limits. EtFOSAA and MeFOSAA were reported from the second analysis and data usability is not adversely affected.
- Surrogate compounds were not recovered in the 25-fold dilution performed on sample DAVIS03-GW-002 and DAVIS-FD-GW-002. These samples were diluted past the instrument's ability to accurately resolve the surrogate compounds and it is not possible to evaluate data usability based on the surrogate recoveries for these samples.

7.1.11 Internal Standard Recoveries

Internal standard areas were within the QPP-specified limits of 50 to 150% of the average area counts measured during the initial calibration.

7.1.12 Data Reporting and Analytical Procedures

SGS J qualified analytes with concentrations between the detection limit (DL) and the LOQ. Amec Foster Wheeler agrees that these results are quantitatively uncertain and has J qualified these results. (Qualifier and reason code: J-TR)

SGS' analytical software is unable to correctly auto-integrate analytes when peaks for both linear and branched isomers are present, so the calibration standards, CCVs, and samples containing both linear and branched isomers require manual integrations.

This page intentionally left blank

8.0 FIELD DUPLICATE RESULTS

Amec Foster Wheeler collected a field duplicate with sample DAVIS03-GW-002 (DAVIS-FD-GW-002).

Detected results and RPDs for the field duplicate are summarized in Table 2. Precision values were within the QPP-specified limits of less than 30% RPD.

This page intentionally left blank

9.0 SUMMARY AND CONCLUSIONS

Amec Foster Wheeler evaluated a total of 128 data records from field samples during the validation. Amec Foster Wheeler J or UJ qualified 22 records (17.2%) as estimated values due to low matrix spike recoveries, low and high surrogate recoveries, and analyte concentrations between the DL and the LOQ.

100% of the data should be considered usable, meeting the QPP-specified 90% completeness goal. Qualified data are summarized in Table 3.

This page intentionally left blank

REFERENCES

- Amec Foster Wheeler, 2018. Final (Revision 2), Site Inspection of AFFF Release Areas, Environmental Programs Worldwide, QPP, Contract FA8903-16-D-0027, Task Order 0004, October 2018
- DoD, 2013. DoD QSM for Environmental Laboratories, Version 5.0. July 2013.
- EPA, 2009. Determination of Selected Perfluorinated Alkyl Acids in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry, Version 1.1, September 2009. EPA Document #: EPA/600/R-08/092.

This page intentionally left blank

TABLES

This page intentionally left blank.

Table 1
Field Samples Submitted to SGS North America Inc.
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Environmental Programs Worldwide
Davis-Monthan Air Force Base, Arizona

Sample Identification	Collection Date	Sample Matrix	Laboratory Sample Identification	Notes
DAVIS03-GW-002	3/9/2019	Water	FA62248-1	MS, Stage 4
DAVIS03-GW-003	3/10/2019	Water	FA62248-2	
DAVIS-EB-031	3/9/2019	QC Water	FA62248-3	Equipment Blank
DAVIS-EB-032	3/10/2019	QC Water	FA62248-4	Equipment Blank
DAVIS-EB-033	3/11/2019	QC Water	FA62248-5	Equipment Blank, not analyzed
DAVIS-FB-001	3/7/2019	QC Water	FA62248-6	Field Blank
DAVIS-FD-GW-002	3/9/2019	Water	FA62248-7	Field Duplicate of sample DAVIS03-GW-002
IDW-SOIL-190311	3/11/2019	Soil	FA62248-8	not validated
DAVIS-EB-034	3/21/2019	QC Water	FA62598-1	Equipment Blank
DAVIS03-GW-004	3/24/2019	Water	FA62805-1	MS
DAVIS03-GW-005	3/25/2019	Water	FA62805-2	
DAVIS03-GW-006	3/26/2019	Water	FA62805-3	
DAVIS-EB-035	3/24/2019	QC Water	FA62805-4	Equipment Blank
DAVIS-EB-036	3/25/2019	QC Water	FA62805-5	Equipment Blank
DAVIS-EB-037	3/26/2019	QC Water	FA62805-6	Equipment Blank
IDW_Soil_5430	3/27/2019	Soil	FA62805-7	not validated
IDW_Soil_6577	3/27/2019	Soil	FA62805-8	not validated
DAVIS03-GW-007	4/5/2019	Water	FA63114-1	MS
DAVIS03-GW-008	4/6/2019	Water	FA63114-2	
DAVIS03-EB-038	4/5/2019	QC Water	FA63114-3	Equipment Blank
DAVIS03-EB-039	4/6/2019	QC Water	FA63114-4	Equipment Blank

Notes:

IDW = Investigation Derived Waste

MS = Matrix Spike

MSD = Matrix Spike Duplicate

Table 2
Field Duplicate Detections
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Environmental Programs Worldwide
Davis-Monthan Air Force Base, Arizona

Analyte	Average LOQ	Primary Sample	Field Duplicate	Units	RPD	Notes
Samples DAVIS03-GW-002 and DAVIS-FD-GW-002						
PFHxA	0.0915	2.15	2.31	µg/L	7%	
PFHpA	0.0915	0.752	0.821	µg/L	9%	
PFOA	0.0915	1.21	1.35	µg/L	11%	
PFNA	0.0915	0.0254 J	0.0286 J	µg/L	12%	
PFBS	0.0915	0.522	0.592	µg/L	13%	
PFHxS	0.460	3.96	4.38	µg/L	10%	
PFOS	0.460	12.2	13.0	µg/L	6%	
6:2 FTS	1.15	6.22	6.71	µg/L	8%	

Notes:

6:2 FTS = 6:2 Fluorotelomer sulfonate

LOQ = limit of quantification

µg/L = micrograms per liter

PFBS = Perfluorobutanesulfonic acid

PFHpA = Perfluoroheptanoic acid

PFHxA = Perfluorohexanoic acid

PFHxS = Perfluorohexanesulfonic acid

PFNA = Perfluorononanoic acid

PFOA = Perfluorooctanoic acid

PFOS = perfluorooctanesulfonic acid

RPD = relative percent difference

Qualifier Definitions:

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Table 3
Qualifiers Added During Validation
Site Inspection of Aqueous Film Forming Foam (AFFF) Release Areas
Environmental Programs Worldwide
Davis-Monthan Air Force Base, Arizona

Sample Identification	Analyte	Results	Validation Qualifiers and Reason Codes
DAVIS-FD-GW-002	PFNA	0.0286 µg/L	J TR
DAVIS03-GW-002	PFNA	0.0254 µg/L	J TR
DAVIS03-GW-003	PFNA	0.0092 µg/L	J TR
DAVIS03-GW-004	8:2 FTS	0.033 µg/L	UJ MSL
DAVIS03-GW-004	EtFOSAA	0.033 µg/L	UJ MSL, SGL
DAVIS03-GW-004	MeFOSAA	0.033 µg/L	UJ MSL, SGL
DAVIS03-GW-004	PFDA	0.0083 µg/L	UJ MSL
DAVIS03-GW-004	PFDoA	0.0083 µg/L	UJ MSL
DAVIS03-GW-004	PFNA	0.0287 µg/L	J SGH, MSL
DAVIS03-GW-004	PFTeDA	0.0083 µg/L	UJ MSL
DAVIS03-GW-004	PFTrDA	0.0083 µg/L	UJ MSL
DAVIS03-GW-004	PFUnA	0.0083 µg/L	UJ MSL
DAVIS03-GW-004	6:2 FTS	0.792 µg/L	J SGL
DAVIS03-GW-004	PFHxS	0.854 µg/L	J SGL
DAVIS03-GW-005	6:2 FTS	0.0347 µg/L	J TR
DAVIS03-GW-005	PFBS	0.0107 µg/L	J TR
DAVIS03-GW-005	PFHpA	0.0171 µg/L	J TR
DAVIS03-GW-005	PFOA	0.0236 µg/L	J TR
DAVIS03-GW-005	PFOS	0.0121 µg/L	J TR
DAVIS03-GW-006	PFBS	0.005 µg/L	J TR
DAVIS03-GW-006	PFHpA	0.0054 µg/L	J TR
DAVIS03-GW-006	PFOA	0.0095 µg/L	J TR

Notes:

µg/L = micrograms per liter

6:2 FTS = 6:2 Fluorotelomer sulfonate

8:2 FTS = 8:2 Fluorotelomer sulfonate

EtFOSAA = Ethyl perfluorooctanesulfonamide

MeFOSAA = Methyl perfluorooctanesulfonamide

PFBS = Perfluorobutanesulfonic acid

PFDA = Perfluorodecanoic acid

PFDoA = Perfluorododecanoic acid

PFHpA = Perfluoroheptanoic acid

PFHxS = Perfluorohexanesulfonic acid

PFNA = Perfluorononanoic acid

PFOA = Perfluorooctanoic acid

PFOS = Perfluorooctanesulfonic acid

PFTeDA = Perfluorotetradecanoic acid

PFTrDA = Perfluorotridecanoic acid

PFUnA = Perfluoroundecanoic acid

Qualifier Definitions:

UJ = The analyte was not detected above the reported sample quantitation limit. However, the reported quantitation limit is approximate and may or may not represent the actual limit of quantitation necessary to accurately and precisely measure the analyte in the sample.

J = The analyte was positively identified; the associated numerical value is the approximate concentration of the analyte in the sample.

Reason Codes:

MSL = Low matrix spike recovery. Analytical result may be biased low

SGH = High surrogate recovery. Analytical result may be biased high.

SGL = Low surrogate recovery. Analytical result may be biased low.

TR = Detected concentration is less than the limit of quantification.

This page intentionally left blank.

Appendix E
Survey Results

This page intentionally left blank.

Survey Report
 Davis Monthan AFB
 Project No. 775303101

Point	Northing	Easting	Elevation	Latitude	Longitude	WELL ID	DESCRIPTION
30001	436405.577	1013213.55	2544.554	32°11'44.55873"	-110°54'14.83393"	MW 03003	GROUND
30002	436403.503	1013212.568	2544.705	32°11'44.53829"	-110°54'14.84559"	MW 03003	CONCRETE
30003	436403.084	1013212.31	2547.995	32°11'44.53418"	-110°54'14.84864"	MW 03003	RIM
30004	436436.64	1014243.299	2548.833	32°11'44.76997"	-110°54'02.84796"	MW 03002	GROUND
30005	436436.554	1014243.926	2549.022	32°11'44.76906"	-110°54'02.84068"	MW 03002	CONCRETE
30006	436436.494	1014244.428	2552.436	32°11'44.76843"	-110°54'02.83483"	MW 03002	RIM
300004	436402.689	1013212.234	2547.331	32°11'44.53028"	-110°54'14.84956"	MW 03003	N EDGE PVC
300005	436436.02	1014244.521	2551.876	32°11'44.76373"	-110°54'02.83381"	MW 03002	N EDGE PVC

Datum

NAD83 (2011) ARIZONA STATE PLANE COORDINATES
 CENTRAL ZONE 0202, INTERNATIONAL FEET
 NAVD88 ELEVATION



This survey was performed under my direct supervision.
 Field efforts were completed on April 4, 2019.

This page intentionally left blank.

Report of Analysis

Client Sample ID:	CARBOY 1		
Lab Sample ID:	FA59680-1	Date Sampled:	11/29/18
Matrix:	AQ - Ground Water	Date Received:	11/29/18
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD	Percent Solids:	n/a
Project:	PFC Water & Bottle Blanks		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q24613.D	1	12/06/18 17:31	NG	12/04/18 12:00	OP72875	S2Q383
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
375-22-4	Perfluorobutanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
307-24-4	Perfluorohexanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROALKYLSULFONATES							
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROCTANESULFONAMIDES							
754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROCTANESULFONAMIDOACETIC ACIDS							
2355-31-9	MeFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	
FLUOROTELOMER SULFONATES							
757124-72-4	4:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CARBOY 1		
Lab Sample ID:	FA59680-1	Date Sampled:	11/29/18
Matrix:	AQ - Ground Water	Date Received:	11/29/18
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD	Percent Solids:	n/a
Project:	PFC Water & Bottle Blanks		

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	96%		50-150%
	13C5-PFPeA	96%		50-150%
	13C5-PFHxA	98%		50-150%
	13C4-PFHpA	99%		50-150%
	13C8-PFOA	99%		50-150%
	13C9-PFNA	92%		50-150%
	13C6-PFDA	80%		50-150%
	13C7-PFUnDA	58%		50-150%
	13C2-PFDoDA	52%		50-150%
	13C2-PFTeDA	57%		50-150%
	13C3-PFBS	99%		50-150%
	13C3-PFHxS	100%		50-150%
	13C8-PFOS	68%		50-150%
	13C8-FOSA	113%		50-150%
	d3-MeFOSAA	80%		50-150%
	13C2-4:2FTS	100%		50-150%
	13C2-6:2FTS	106%		50-150%
	13C2-8:2FTS	82%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CARBOY 2	
Lab Sample ID:	FA59680-2	Date Sampled: 11/29/18
Matrix:	AQ - Ground Water	Date Received: 11/29/18
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD	Percent Solids: n/a
Project:	PFC Water & Bottle Blanks	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q24614.D	1	12/06/18 17:48	NG	12/04/18 12:00	OP72875	S2Q383
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
375-22-4	Perfluorobutanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
307-24-4	Perfluorohexanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROALKYLSULFONATES							
375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROCTANESULFONAMIDES							
754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
PERFLUOROCTANESULFONAMIDOACETIC ACIDS							
2355-31-9	MeFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	
FLUOROTELOMER SULFONATES							
757124-72-4	4:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CARBOY 2	Date Sampled:	11/29/18
Lab Sample ID:	FA59680-2	Date Received:	11/29/18
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD		
Project:	PFC Water & Bottle Blanks		

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%		50-150%
	13C5-PFPeA	89%		50-150%
	13C5-PFHxA	91%		50-150%
	13C4-PFHpA	92%		50-150%
	13C8-PFOA	94%		50-150%
	13C9-PFNA	86%		50-150%
	13C6-PFDA	76%		50-150%
	13C7-PFUnDA	56%		50-150%
	13C2-PFDoDA	52%		50-150%
	13C2-PFTeDA	57%		50-150%
	13C3-PFBS	92%		50-150%
	13C3-PFHxS	92%		50-150%
	13C8-PFOS	67%		50-150%
	13C8-FOSA	108%		50-150%
	d3-MeFOSAA	78%		50-150%
	13C2-4:2FTS	92%		50-150%
	13C2-6:2FTS	99%		50-150%
	13C2-8:2FTS	79%		50-150%

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CARBOY 3	Date Sampled:	11/29/18
Lab Sample ID:	FA59680-3	Date Received:	11/29/18
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD		
Project:	PFC Water & Bottle Blanks		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	2Q24615.D	1	12/06/18 18:04	NG	12/04/18 12:00	OP72875	S2Q383
Run #2 ^a	2Q24673.D	1	12/07/18 18:39	NG	12/04/18 12:00	OP72875	S2Q384

Run #	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2	125 ml	1.0 ml

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
---------	----------	--------	-----	-----	----	-------	---

PERFLUOROALKYLCARBOXYLIC ACIDS

375-22-4	Perfluorobutanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2706-90-3	Perfluoropentanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
307-24-4	Perfluorohexanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-67-1	Perfluorooctanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-95-1	Perfluorononanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-76-2	Perfluorodecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
307-55-1	Perfluorododecanoic acid	0.0040 U	0.0080	0.0040	0.0030	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
2706-91-4	Perfluoropentanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
375-92-8	Perfluoroheptanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
68259-12-1	Perfluorononanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	
335-77-3	Perfluorodecanesulfonic acid	0.0040 U	0.0080	0.0040	0.0020	ug/l	

PERFLUOROCTANESULFONAMIDES

754-91-6	PFOSA	0.0040 U	0.0080	0.0040	0.0020	ug/l	
----------	-------	----------	--------	--------	--------	------	--

PERFLUOROCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	
2991-50-6	EtFOSAA	0.016 U	0.040	0.016	0.0080	ug/l	

FLUOROTELOMER SULFONATES

757124-72-4	4:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	CARBOY 3	
Lab Sample ID:	FA59680-3	Date Sampled: 11/29/18
Matrix:	AQ - Ground Water	Date Received: 11/29/18
Method:	EPA 537M QSM5.1 B-15 EPA 537 MOD	Percent Solids: n/a
Project:	PFC Water & Bottle Blanks	

PFAS List

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
39108-34-4	8:2 Fluorotelomer sulfonate	0.0080 U	0.016	0.0080	0.0040	ug/l	

CAS No.	ID Standard Recoveries	Run# 1	Run# 2	Limits
	13C4-PFBA	89%	91%	50-150%
	13C5-PFPeA	89%	90%	50-150%
	13C5-PFHxA	92%	92%	50-150%
	13C4-PFHpA	94%	92%	50-150%
	13C8-PFOA	94%	94%	50-150%
	13C9-PFNA	85%	90%	50-150%
	13C6-PFDA	78%	74%	50-150%
	13C7-PFUnDA	54%	54%	50-150%
	13C2-PFDoDA	48%	48%	50-150%
	13C2-PFTeDA	52%	56%	50-150%
	13C3-PFBS	91%	92%	50-150%
	13C3-PFHxS	92%	95%	50-150%
	13C8-PFOS	71%	71%	50-150%
	13C8-FOSA	111%	109%	50-150%
	d3-MeFOSAA	76%	76%	50-150%
	13C2-4:2FTS	92%	93%	50-150%
	13C2-6:2FTS	98%	98%	50-150%
	13C2-8:2FTS	80%	77%	50-150%

(a) Confirmation Run.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Wood Environment & Infrastructure Soln.

Davis Monthan AFB, AZ

775303101

SGS Job Number: FA62248

Sampling Dates: 03/07/19 - 03/11/19



Report to:

Wood Environment & Infrastructure Soln.
7376 SW Durham Rd
Portland, OR 97224
marie.bevier@amecfw.com; hope.mariska@woodplc.com;
samantha.sargent@woodplc.com; sarah.schneider@woodplc.com
ATTN: Marie Bevier

Total number of pages in report: **304**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.



April 3, 2019

Ms. Marie Bevier
Wood
7376 SW Durham Rd
Portland, OR 97224

RE: SGS North America Inc. - Orlando job FA62248 Reissue

Dear Ms. Bevier,

The final report for job number FA62248 has been edited to reflect requested corrections. These edits have been incorporated into the revised report.

The report has been split per your request.

Please feel free to contact us if we can be of further assistance.

Sincerely,

SGS North America, Inc. - Orlando

Table of Contents

-1-

Section 1: Sample Summary	4
Section 2: Case Narrative/Conformance Summary	5
Section 3: Summary of Hits	7
Section 4: Sample Results	9
4.1: FA62248-1: DAVIS03-GW-002	10
4.2: FA62248-2: DAVIS03-GW-003	12
4.3: FA62248-3: DAVIS-EB-031	13
4.4: FA62248-4: DAVIS-EB-032	14
4.5: FA62248-6: DAVIS-FB-001	15
4.6: FA62248-7: DAVIS-FD-GW-002	16
Section 5: Misc. Forms	18
5.1: Chain of Custody	19
5.2: QC Evaluation: DOD QSM5 Limits	24
Section 6: MS Semi-volatiles - QC Data Summaries	25
6.1: Method Blank Summary	26
6.2: Blank Spike Summary	27
6.3: Matrix Spike Summary	28
6.4: Duplicate Summary	29
6.5: Internal Standard Area Summaries	30
6.6: Surrogate Recovery Summaries	33
6.7: Initial and Continuing Calibration Summaries	34
Section 7: MS Semi-volatiles - Raw Data	51
7.1: Samples	52
7.2: Method Blanks	107
7.3: Blank Spikes	110
7.4: Matrix Spikes	120
7.5: Duplicates	129
7.6: Initial and Continuing Calibrations	136
7.7: Instrument Run Logs	300
7.8: Prep Logs	304



Sample Summary

Wood Environment & Infrastructure Soln.

Job No: FA62248

Davis Monthan AFB, AZ
 Project No: 775303101

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
FA62248-1	03/09/19	11:40 TB	03/12/19	AQ	Ground Water	DAVIS03-GW-002
FA62248-2	03/10/19	16:20 TB	03/12/19	AQ	Ground Water	DAVIS03-GW-003
FA62248-3	03/09/19	11:05 TB	03/12/19	AQ	Equipment Blank	DAVIS-EB-031
FA62248-4	03/10/19	08:00 TB	03/12/19	AQ	Equipment Blank	DAVIS-EB-032
FA62248-5	03/11/19	13:30 TB	03/12/19	AQ	Equipment Blank	DAVIS-EB-033
FA62248-6	03/07/19	09:55 TB	03/12/19	AQ	Field Blank Water	DAVIS-FB-001
FA62248-7	03/09/19	11:40 TB	03/12/19	AQ	Ground Water	DAVIS-FD-GW-002

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Wood Environment & Infrastructure Soln.

Job No: FA62248

Site: Davis Monthan AFB, AZ

Report Date(s): 3/26/2019 3:19:01 PM

4/4/2019 1:43:24 PM

5 Samples and 1 Field Blank were collected between 03/07/2019 and 03/10/2019 and were received at SGS North America Inc - Orlando on 03/12/2019 properly preserved, at 1.9 Deg. C and intact. These samples received an SGS Orlando job number of FA62248. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537 MOD

Matrix: AQ

Batch ID: OP74166

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

All method blanks for this batch meet method specific criteria.

Sample(s) FA62248-1MS, FA62248-7DUP were used as the QC samples indicated.

Matrix Spike Recovery(s) for 8:2 Fluorotelomer sulfonate, EtFOSAA, MeFOSAA, 6:2 Fluorotelomer sulfonate, Perfluoroheptanoic acid, Perfluorohexanesulfonic acid, Perfluorohexanoic acid, Perfluorooctanesulfonic acid are outside control limits. Outside control limits due to high level in sample relative to spike amount.

RPD(s) for Duplicate for Perfluorononanoic acid are outside control limits for sample OP74166-DUP. Probable cause is due to sample non-homogeneity.

Sample(s) FA62248-1, FA62248-7 have surrogates outside control limits.

FA62248-1 for 13C2-PFDA: Outside control limits due to dilution.

FA62248-1 for 13C2-PFHxA: Outside control limits due to dilution.

FA62248-1 for d5-NEtFOSAA: Outside control limits due to dilution.

FA62248-1: Dilution required due to matrix interference (internal standard failure).

FA62248-2: Dilution required due to matrix interference (internal standard failure).

FA62248-7 for 13C2-PFDA: Outside control limits due to dilution.

FA62248-7 for 13C2-PFHxA: Outside control limits due to dilution.

FA62248-7 for d5-NEtFOSAA: Outside control limits due to dilution.

FA62248-7: Dilution required due to matrix interference (internal standard failure).

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (Signature on File)

Revised Narrative prepared by:

Ariel Hartney, Client Services (Signature on File)

Manual Integration Summary

Lab Sample ID	Analysis Type	File ID	Manual Integrations
FA62248-1	MSSEMI	3Q1939.D	Perfluoroheptanoic acid, Perfluorononanoic acid, Perfluorooctanoic acid
FA62248-1	MSSEMI	3Q1940.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
FA62248-2	MSSEMI	3Q1942.D	Perfluoroheptanoic acid, Perfluorohexanesulfonic acid, Perfluorononanoic acid, Perfluorooctanoic acid
FA62248-2	MSSEMI	3Q1943.D	Perfluorooctanesulfonic acid
FA62248-7	MSSEMI	3Q1945.D	Perfluoroheptanoic acid, Perfluorononanoic acid, Perfluorooctanoic acid
FA62248-7	MSSEMI	3Q1946.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
OP74166-BS	MSSEMI	3Q1913.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
OP74166-DUP	MSSEMI	3Q1947.D	Perfluoroheptanesulfonic acid, Perfluoroheptanoic acid, Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid, Perfluorooctanoic acid, Perfluoropentanesulfonic acid, PFOSA
OP74166-MS	MSSEMI	3Q1941.D	Perfluoroheptanesulfonic acid, Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid, Perfluorooctanoic acid, Perfluoropentanesulfonic acid, PFOSA
S3Q52-CC52	MSSEMI	3Q1919.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1902.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1903.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1904.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1905.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1906.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1908.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-IC52	MSSEMI	3Q1909.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-ICC52	MSSEMI	3Q1907.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-ICV52	MSSEMI	3Q1910.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-ICV52	MSSEMI	3Q1911.D	EtFOSAA, MeFOSAA, Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q52-ICV52	MSSEMI	3Q1912.D	EtFOSAA, MeFOSAA, Perfluorooctanesulfonic acid, Perfluorooctanoic acid
S3Q53-CC52	MSSEMI	3Q1938.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid

Summary of Hits

Job Number: FA62248
Account: Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ
Collected: 03/07/19 thru 03/11/19



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
---------------	------------------	-----------------	-----	-----	-------	--------

FA62248-1 DAVIS03-GW-002

Perfluorohexanoic acid ^a	2.15	0.083	0.042	ug/l	EPA 537 MOD
Perfluoroheptanoic acid ^a	0.752	0.083	0.042	ug/l	EPA 537 MOD
Perfluorooctanoic acid ^a	1.21	0.083	0.042	ug/l	EPA 537 MOD
Perfluorononanoic acid ^a	0.0254 J	0.083	0.042	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid ^a	0.522	0.083	0.042	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid	3.96	0.42	0.21	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	12.2	0.42	0.21	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate	6.22	1.0	0.83	ug/l	EPA 537 MOD

FA62248-2 DAVIS03-GW-003

Perfluorohexanoic acid ^a	0.525	0.035	0.017	ug/l	EPA 537 MOD
Perfluoroheptanoic acid ^a	0.200	0.035	0.017	ug/l	EPA 537 MOD
Perfluorooctanoic acid ^a	0.351	0.035	0.017	ug/l	EPA 537 MOD
Perfluorononanoic acid ^a	0.00920 J	0.035	0.017	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid ^a	0.141	0.035	0.017	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid ^a	1.18	0.035	0.017	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	4.20	0.17	0.087	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate ^a	1.53	0.087	0.070	ug/l	EPA 537 MOD

FA62248-3 DAVIS-EB-031

No hits reported in this sample.

FA62248-4 DAVIS-EB-032

No hits reported in this sample.

FA62248-6 DAVIS-FB-001

No hits reported in this sample.

FA62248-7 DAVIS-FD-GW-002

Perfluorohexanoic acid ^a	2.31	0.10	0.050	ug/l	EPA 537 MOD
Perfluoroheptanoic acid ^a	0.821	0.10	0.050	ug/l	EPA 537 MOD
Perfluorooctanoic acid ^a	1.35	0.10	0.050	ug/l	EPA 537 MOD
Perfluorononanoic acid ^a	0.0286 J	0.10	0.050	ug/l	EPA 537 MOD
Perfluorobutanesulfonic acid ^a	0.592	0.10	0.050	ug/l	EPA 537 MOD
Perfluorohexanesulfonic acid	4.38	0.50	0.25	ug/l	EPA 537 MOD
Perfluorooctanesulfonic acid	13.0	0.50	0.25	ug/l	EPA 537 MOD
6:2 Fluorotelomer sulfonate	6.71	1.3	1.0	ug/l	EPA 537 MOD

Summary of Hits

Job Number: FA62248
Account: Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ
Collected: 03/07/19 thru 03/11/19



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
---------------	------------------	-----------------	-----	-----	-------	--------

(a) Dilution required due to matrix interference (internal standard failure).

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Page 1 of 2

Client Sample ID:	DAVIS03-GW-002		Date Sampled:	03/09/19
Lab Sample ID:	FA62248-1		Date Received:	03/12/19
Matrix:	AQ - Ground Water		Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD			
Project:	Davis Monthan AFB, AZ			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q1939.D	5	03/18/19 11:59	NAF	03/14/19 11:00	OP74166	S3Q53
Run #2	3Q1940.D	25	03/18/19 12:14	NAF	03/14/19 11:00	OP74166	S3Q53

	Initial Volume	Final Volume
Run #1	120 ml	1.0 ml
Run #2	120 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	2.15	0.083	0.042	0.021	ug/l	
375-85-9	Perfluoroheptanoic acid	0.752	0.083	0.042	0.021	ug/l	
335-67-1	Perfluorooctanoic acid	1.21	0.083	0.042	0.021	ug/l	
375-95-1	Perfluorononanoic acid	0.0254	0.083	0.042	0.021	ug/l	J
335-76-2	Perfluorodecanoic acid	0.042 U	0.083	0.042	0.021	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.042 U	0.083	0.042	0.021	ug/l	
307-55-1	Perfluorododecanoic acid	0.042 U	0.083	0.042	0.021	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.042 U	0.083	0.042	0.021	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.042 U	0.083	0.042	0.021	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.522	0.083	0.042	0.021	ug/l	
355-46-4	Perfluorohexanesulfonic acid	3.96 ^b	0.42	0.21	0.10	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	12.2 ^b	0.42	0.21	0.10	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.17 U	0.21	0.17	0.083	ug/l	
2991-50-6	EtFOSAA	0.17 U	0.21	0.17	0.083	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	6.22 ^b	1.0	0.83	0.42	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.17 U	0.21	0.17	0.083	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	99%	0% ^c	61-134%
	13C2-PFDA	101%	0% ^c	62-128%
	d5-EtFOSAA	92%	0% ^c	57-135%

(a) Dilution required due to matrix interference (internal standard failure).

(b) Result is from Run# 2

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS03-GW-002	Date Sampled:	03/09/19
Lab Sample ID:	FA62248-1	Date Received:	03/12/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
---------	----------	--------	-----	-----	----	-------	---

(c) Outside control limits due to dilution.

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound



Report of Analysis

4.2
4

Client Sample ID:	DAVIS03-GW-003	Date Sampled:	03/10/19
Lab Sample ID:	FA62248-2	Date Received:	03/12/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q1942.D	2	03/18/19 12:45	NAF	03/14/19 11:00	OP74166	S3Q53
Run #2	3Q1943.D	10	03/18/19 13:00	NAF	03/14/19 11:00	OP74166	S3Q53

	Initial Volume	Final Volume
Run #1	115 ml	1.0 ml
Run #2	115 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.525	0.035	0.017	0.0087	ug/l	
375-85-9	Perfluoroheptanoic acid	0.200	0.035	0.017	0.0087	ug/l	
335-67-1	Perfluorooctanoic acid	0.351	0.035	0.017	0.0087	ug/l	
375-95-1	Perfluorononanoic acid	0.00920	0.035	0.017	0.0087	ug/l	J
335-76-2	Perfluorodecanoic acid	0.017 U	0.035	0.017	0.0087	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.017 U	0.035	0.017	0.0087	ug/l	
307-55-1	Perfluorododecanoic acid	0.017 U	0.035	0.017	0.0087	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.017 U	0.035	0.017	0.0087	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.017 U	0.035	0.017	0.0087	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.141	0.035	0.017	0.0087	ug/l	
355-46-4	Perfluorohexanesulfonic acid	1.18	0.035	0.017	0.0087	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	4.20 ^b	0.17	0.087	0.043	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.070 U	0.087	0.070	0.035	ug/l	
2991-50-6	EtFOSAA	0.070 U	0.087	0.070	0.035	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	1.53	0.087	0.070	0.035	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.070 U	0.087	0.070	0.035	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	95%	99%	61-134%
	13C2-PFDA	122%	110%	62-128%
	d5-EtFOSAA	97%	98%	57-135%

(a) Dilution required due to matrix interference (internal standard failure).

(b) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS-EB-031	Date Sampled:	03/09/19
Lab Sample ID:	FA62248-3	Date Received:	03/12/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q1918.D	1	03/15/19 16:39	NAF	03/14/19 11:00	OP74166	S3Q52
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	99%		61-134%
	13C2-PFDA	117%		62-128%
	d5-EtFOSAA	99%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS-EB-032	Date Sampled:	03/10/19
Lab Sample ID:	FA62248-4	Date Received:	03/12/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q1944.D	1	03/18/19 13:16	NAF	03/14/19 11:00	OP74166	S3Q53
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	99%		61-134%
	13C2-PFDA	114%		62-128%
	d5-EtFOSAA	101%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS-FB-001	Date Sampled:	03/07/19
Lab Sample ID:	FA62248-6	Date Received:	03/12/19
Matrix:	AQ - Field Blank Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q1923.D	1	03/15/19 17:55	NAF	03/14/19 11:00	OP74166	S3Q52
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	94%		61-134%
	13C2-PFDA	94%		62-128%
	d5-EtFOSAA	83%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS-FD-GW-002		Date Sampled:	03/09/19
Lab Sample ID:	FA62248-7		Date Received:	03/12/19
Matrix:	AQ - Ground Water		Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD			
Project:	Davis Monthan AFB, AZ			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q1945.D	5	03/18/19 13:31	NAF	03/14/19 11:00	OP74166	S3Q53
Run #2	3Q1946.D	25	03/18/19 13:46	NAF	03/14/19 11:00	OP74166	S3Q53

	Initial Volume	Final Volume
Run #1	100 ml	1.0 ml
Run #2	100 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	2.31	0.10	0.050	0.025	ug/l	
375-85-9	Perfluoroheptanoic acid	0.821	0.10	0.050	0.025	ug/l	
335-67-1	Perfluorooctanoic acid	1.35	0.10	0.050	0.025	ug/l	
375-95-1	Perfluorononanoic acid	0.0286	0.10	0.050	0.025	ug/l	J
335-76-2	Perfluorodecanoic acid	0.050 U	0.10	0.050	0.025	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.050 U	0.10	0.050	0.025	ug/l	
307-55-1	Perfluorododecanoic acid	0.050 U	0.10	0.050	0.025	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.050 U	0.10	0.050	0.025	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.050 U	0.10	0.050	0.025	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.592	0.10	0.050	0.025	ug/l	
355-46-4	Perfluorohexanesulfonic acid	4.38 ^b	0.50	0.25	0.13	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	13.0 ^b	0.50	0.25	0.13	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.20 U	0.25	0.20	0.10	ug/l	
2991-50-6	EtFOSAA	0.20 U	0.25	0.20	0.10	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	6.71 ^b	1.3	1.0	0.50	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.20 U	0.25	0.20	0.10	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	96%	0% ^c	61-134%
	13C2-PFDA	111%	0% ^c	62-128%
	d5-EtFOSAA	88%	0% ^c	57-135%

(a) Dilution required due to matrix interference (internal standard failure).

(b) Result is from Run# 2

U = Not detected LOD = Limit of Detection J = Indicates an estimated value
 LOQ = Limit of Quantitation DL = Detection Limit B = Indicates analyte found in associated method blank
 E = Indicates value exceeds calibration range N = Indicates presumptive evidence of a compound

4.6
4

Report of Analysis

Client Sample ID:	DAVIS-FD-GW-002	Date Sampled:	03/09/19
Lab Sample ID:	FA62248-7	Date Received:	03/12/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
---------	----------	--------	-----	-----	----	-------	---

(c) Outside control limits due to dilution.

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5 Limits

FA62248



Amec Foster Wheeler Environment & Infrastructure
 4600 E. Washington Street, Suite 600
 Phoenix, AZ 85034-1917
 (602) 733-6013

SHIP TO:
 SGS-Accutest
 4405 Vineland Road, Suite C-15
 Orlando, Florida 32811
 Attn: Norm Farmer
 Lab Phone# (407) 425 6700 ext 14924

CHAIN OF CUSTODY

DATE: 3/11/2019

COC #: DAVIS190311A

PAGE: 1 OF 1

Project Name: Davis Monthan AFB	Project Contact: Laura Simmons	Bill To: Amec Foster Wheeler Environment & Infrastructure	Disposal Instructions: LAB
Project Number: 778508101	Phone Number: (855) 671-6774	9210 Sky Park Court #200	Shipment Method: PEDEX
Project Manager: Sarah Schroeder	Project Phase: DMF001.0300	San Diego, CA 92123	Waybill Number: N/A

Sample Information						Methods for Analysis												RUSH										
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MIS/MSD	EPA 537M	VOCs (SV006)	VOCs (V004)	Herbicides	Pesticides (SV002)	Metals (MT003/MT009)	Mercury (MT012)	PCBs (SV004)	PH (d60 and d80) (SV001/V005)	Flashpoint	Sulfide	pH (WC020)	Cyanide (WC001/2/3)	5 Day TAT	96 Hour	12 Hour	24 Hour	48 Hour	5 Day	TOTAL BOTTLES	HOLD ALL ANALYSES		
1	DAVIS03-GW-002	03/09/19 11:40	WG	N	N	X																						
2	DAVIS03-GW-003	03/10/19 16:20	WG	N	N	X																						
3	DAVIS-EB-031	03/09/19 11:05	WQ	EB	N	X																						
4	DAVIS-EB-032	03/10/19 08:00	WQ	EB	N	X																						
5	DAVIS-EB-033	03/11/19 13:30	WQ	EB	N	X																						
6	DAVIS-FB-001	03/06/19 09:55	WQ	FB	N	X																						
7	DAVIS-FB-GW-002	03/09/19 11:40	WG	D	N	X																						
8	IDW_Soil_190311	03/11/19 12:50	SO	N	N	X	X	X	X	X	X	X	X	X	X	X	X	X										
9																												
10																												
11																												
12																												

Sampler's Signature: <i>[Signature]</i> Relinquished By/Affiliation: <i>[Signature]</i> Received By: <i>[Signature]</i> Relinquished By/Affiliation: <i>[Signature]</i> Received By: <i>[Signature]</i> Relinquished By/Affiliation: <i>[Signature]</i> Received By (LAB): <i>[Signature]</i>	Date: 3/11/19 Time: 1530 Date: 3/11/19 Time: 1530 Date: 3/11/19 Time: 1530 Date: 3/11/19 Time: 1630 Date: 03/12/19 Time: 945	For Lab Use Does COC match samples: Y or N Broken Container: Y or N COC seal intact: Y or N Other problems: Y or N WSDOT contacted: Y or N Date contacted: _____ Cooler Temperature at receipt: _____ °C	Comments: X=Analyze H=Hold Analysis Request 5 Day TAT for PFAS Samples sent to SGS NUMBER OF COOLERS SENT: _____
Analyte List: 537 + FTS List			

1.9

51
5



SGS Sample Receipt Summary

Job Number: FA62248

Client: AMEC FOSTER WHEELER

Project: DAVIS MONTHAN AFB

Date / Time Received: 3/12/2019 9:45:00 AM

Delivery Method: FED EX

Airbill #'s: 1002303121660003281100790932176818

Therm ID: IR 1;	Therm CF: -0.2;	# of Coolers: 1
Cooler Temps (Raw Measured) °C: Cooler 1: (2.1);		
Cooler Temps (Corrected) °C: Cooler 1: (1.9);		

Cooler Information

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Temp criteria achieved	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Cooler temp verification	<u>IR Gun</u>		
5. Cooler media	<u>Ice (Bag)</u>		

Sample Information

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Sample labels present on bottles	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Samples preserved properly	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Condition of sample	<u>Intact</u>			
5. Sample recvd within HT	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
7. VOCs have headspace	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
9. Compositing instructions clear	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. % Solids Jar received?	<input checked="" type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>
12. Residual Chlorine Present?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Trip Blank Information

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Trip Blank listed on COC	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input type="checkbox"/>
	<u>W</u>	<u>or</u>	<u>S</u>	<u>N/A</u>
3. Type Of TB Received	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____
 Test Strip Lot #s: pH 0-3 _____ 230315 _____
 Residual Chlorine Test Strip Lot #: _____

Number of 5035 Field Kits: 1
 pH 10-12 _____ 219813A _____

Number of Lab Filtered Metals: _____
 Other: (Specify) _____

Comments

SM001
 Rev. Date 05/24/17

Technician: SHAYLAP

Date: 3/12/2019 9:45:00 AM

Reviewer: _____

Date: _____

FA62248: Chain of Custody

Page 2 of 5

Job Change Order: FA62248

Requested Date:	3/12/2019	Received Date:	3/12/2019
Account Name:	Wood Environment & Infrastructur	Due Date:	3/19/2019
Project Description:	Davis Monthan AFB, AZ	Deliverable:	FULT1
CSR:	AC	TAT (Days):	7

=====
Sample #: FA62248-5 **Change:**
Dept: Please cancel sample DAVIS-EB-033
TAT: 7

DAVIS-EB-033
=====

FA62248: Chain of Custody
Page 3 of 5

Above Changes Per: Laura Simmons **Date/Time:** 3/12/2019 3:37:52 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Page 1 of 1

Job Change Order: FA62248

Requested Date:	4/3/2019	Received Date:	3/12/2019
Account Name:	Wood Environment & Infrastructur	Due Date:	3/19/2019
Project Description:	Davis Monthan AFB, AZ	Deliverable:	FULT1
CSR:	AC	TAT (Days):	2

=====
Sample #: FA62248-all **Change:**
Dept: Please split into two reports, 1-7 in one report and -8 into second report.
TAT: 2
=====

FA62248: Chain of Custody
Page 5 of 5

Above Changes Per: Laura Simmons **Date/Time:** 4/3/2019 4:46:11 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Page 1 of 1

QC Evaluation: DOD QSM5 Limits

Job Number: FA62248
Account: Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ
Collected: 03/07/19 thru 03/11/19

QC Sample ID	CAS#	Analyte	Sample Result Type	Result Type	Units	Limits
--------------	------	---------	--------------------	-------------	-------	--------

No Exceptions found.

* Sample used for QC is not from job FA62248

5.2
5

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74166-MB	3Q1914.D	1	03/15/19	NAF	03/14/19	OP74166	S3Q52

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA62248-1, FA62248-2, FA62248-3, FA62248-4, FA62248-6, FA62248-7

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	0.016	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.016	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.016	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.016	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.016	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.016	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.016	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.016	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.016	0.0040	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.016	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.016	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.016	0.0040	ug/l	
2355-31-9	MeFOSAA	ND	0.040	0.016	ug/l	
2991-50-6	EtFOSAA	ND	0.040	0.016	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.040	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.040	0.016	ug/l	

CAS No.	Surrogate Recoveries	Limits	
	13C2-PFHxA	105%	61-134%
	13C2-PFDA	111%	62-128%
	d5-EtFOSAA	93%	57-135%

Blank Spike Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74166-BS	3Q1913.D	1	03/15/19	NAF	03/14/19	OP74166	S3Q52

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA62248-1, FA62248-2, FA62248-3, FA62248-4, FA62248-6, FA62248-7

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
307-24-4	Perfluorohexanoic acid	0.16	0.151	94	63-146
375-85-9	Perfluoroheptanoic acid	0.16	0.155	97	71-138
335-67-1	Perfluorooctanoic acid	0.16	0.163	102	74-137
375-95-1	Perfluorononanoic acid	0.16	0.161	101	76-140
335-76-2	Perfluorodecanoic acid	0.16	0.174	109	65-148
2058-94-8	Perfluoroundecanoic acid	0.16	0.138	86	57-138
307-55-1	Perfluorododecanoic acid	0.16	0.126	79	58-118
72629-94-8	Perfluorotridecanoic acid	0.16	0.155	97	52-120
376-06-7	Perfluorotetradecanoic acid	0.16	0.147	92	49-122
375-73-5	Perfluorobutanesulfonic acid	0.16	0.154	96	73-148
355-46-4	Perfluorohexanesulfonic acid	0.16	0.159	99	74-142
1763-23-1	Perfluorooctanesulfonic acid	0.16	0.149	93	70-134
2355-31-9	MeFOSAA	0.16	0.138	86	57-128
2991-50-6	EtFOSAA	0.16	0.127	79	55-135
27619-97-2	6:2 Fluorotelomer sulfonate	0.16	0.162	101	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.16	0.160	100	61-154

CAS No.	Surrogate Recoveries	BSP	Limits
	13C2-PFHxA	113%	61-134%
	13C2-PFDA	115%	62-128%
	d5-EtFOSAA	92%	57-135%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74166-MS	3Q1941.D	25	03/18/19	NAF	03/14/19	OP74166	S3Q53
FA62248-1 ^a	3Q1939.D	5	03/18/19	NAF	03/14/19	OP74166	S3Q53
FA62248-1	3Q1940.D	25	03/18/19	NAF	03/14/19	OP74166	S3Q53

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA62248-1, FA62248-2, FA62248-3, FA62248-4, FA62248-6, FA62248-7

CAS No.	Compound	FA62248-1 ug/l	Spike Q	MS ug/l	MS %	Limits
307-24-4	Perfluorohexanoic acid	2.15		0.174	2.25	58* ^b 63-146
375-85-9	Perfluoroheptanoic acid	0.752		0.174	0.865	65* ^b 71-138
335-67-1	Perfluorooctanoic acid	1.21		0.174	1.35	81 74-137
375-95-1	Perfluorononanoic acid	0.0254 ^J		0.174	0.188	93 76-140
335-76-2	Perfluorodecanoic acid	0.083 ^U		0.174	0.164	94 65-148
2058-94-8	Perfluoroundecanoic acid	0.083 ^U		0.174	0.174	100 57-138
307-55-1	Perfluorododecanoic acid	0.083 ^U		0.174	0.133	76 58-118
72629-94-8	Perfluorotridecanoic acid	0.083 ^U		0.174	0.132	76 52-120
376-06-7	Perfluorotetradecanoic acid	0.083 ^U		0.174	0.132	76 49-122
375-73-5	Perfluorobutanesulfonic acid	0.522		0.174	0.651	74 73-148
355-46-4	Perfluorohexanesulfonic acid	3.96 ^c		0.174	4.41	259* ^b 74-142
1763-23-1	Perfluorooctanesulfonic acid	12.2 ^c		0.174	13.5	748* ^b 70-134
2355-31-9	MeFOSAA	0.21 ^U		0.174	ND	0* 57-128
2991-50-6	EtFOSAA	0.21 ^U		0.174	ND	0* 55-135
27619-97-2	6:2 Fluorotelomer sulfonate	6.22 ^c		0.174	6.70	276* ^b 70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.21 ^U		0.174	ND	0* 61-154

CAS No.	Surrogate Recoveries	MS	FA62248-1	FA62248-1	Limits
	13C2-PFHxA	0%* ^d	99%	0%* ^d	61-134%
	13C2-PFDA	0%* ^d	101%	0%* ^d	62-128%
	d5-EtFOSAA	0%* ^d	92%	0%* ^d	57-135%

- (a) Dilution required due to matrix interference (internal standard failure).
(b) Outside control limits due to high level in sample relative to spike amount.
(c) Result is from Run #2.
(d) Outside control limits due to dilution.

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74166-DUP	3Q1947.D	25	03/18/19	NAF	03/14/19	OP74166	S3Q53
FA62248-7 ^a	3Q1945.D	5	03/18/19	NAF	03/14/19	OP74166	S3Q53
FA62248-7	3Q1946.D	25	03/18/19	NAF	03/14/19	OP74166	S3Q53

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA62248-1, FA62248-2, FA62248-3, FA62248-4, FA62248-6, FA62248-7

CAS No.	Compound	FA62248-7 ug/l	DUP Q	ug/l	Q	RPD	Limits
307-24-4	Perfluorohexanoic acid	2.31		2.04		12	30
375-85-9	Perfluoroheptanoic acid	0.821		0.747		9	30
335-67-1	Perfluorooctanoic acid	1.35		1.22		10	30
375-95-1	Perfluorononanoic acid	0.0286	J	ND		200*	30
335-76-2	Perfluorodecanoic acid	0.10 U		ND		nc	30
2058-94-8	Perfluoroundecanoic acid	0.10 U		ND		nc	30
307-55-1	Perfluorododecanoic acid	0.10 U		ND		nc	30
72629-94-8	Perfluorotridecanoic acid	0.10 U		ND		nc	30
376-06-7	Perfluorotetradecanoic acid	0.10 U		ND		nc	30
375-73-5	Perfluorobutanesulfonic acid	0.592		0.494		18	30
355-46-4	Perfluorohexanesulfonic acid	4.38 ^b		4.29		2	30
1763-23-1	Perfluorooctanesulfonic acid	13.0 ^b		12.7		2	30
2355-31-9	MeFOSAA	0.25 U		ND		nc	30
2991-50-6	EtFOSAA	0.25 U		ND		nc	30
27619-97-2	6:2 Fluorotelomer sulfonate	6.71 ^b		6.38		5	30
39108-34-4	8:2 Fluorotelomer sulfonate	0.25 U		ND		nc	30

CAS No.	Surrogate Recoveries	DUP	FA62248-7	FA62248-7	Limits
	13C2-PFH _x A	0%* ^c	96%	0%* ^c	61-134%
	13C2-PFDA	0%* ^c	111%	0%* ^c	62-128%
	d5-EtFOSAA	0%* ^c	88%	0%* ^c	57-135%

(a) Dilution required due to matrix interference (internal standard failure).

(b) Result is from Run #2.

(c) Outside control limits due to dilution.

* = Outside of Control Limits.

Internal Standard Area Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Check Std: S3Q52-ICC52	Injection Date: 03/15/19
Lab File ID: 3Q1907.D	Injection Time: 13:50
Instrument ID: GCMS3Q	Method: EPA 537 MOD

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Initial Cal ^a	147216	3.56	40477	6.60	184585	6.62	59171	7.19	19833	7.75	170940	8.41
Check Std ^b	144511	3.56	39408	6.60	180561	6.62	57568	7.19	19018	7.75	169251	8.41
Upper Limit ^c	220824	4.56	60716	7.60	276878	7.62	88757	8.19	29750	8.75	256410	9.41
Lower Limit ^d	73608	2.56	20239	5.60	92293	5.62	29586	6.19	9917	6.75	85470	7.41

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP74166-BS	144141	3.57	40793	6.61	183696	6.63	57763	7.20	21653	7.75	194809	8.41
OP74166-MB	147784	3.57	40334	6.61	196999	6.63	59253	7.20	22577	7.75	206087	8.42
FA62248-3	135706	3.57	39334	6.61	191660	6.63	56468	7.20	22288	7.74	219347	8.28

- IS 1** = 13C3-PFPeA
- IS 2** = 13C2-6:2FTS
- IS 3** = 13C2-PFOA
- IS 4** = 13C4-PFOS
- IS 5** = d3-MeFOSAA
- IS 6** = 13C2-PFDoDA

(a) Initial Cal is: S3Q52-ICC52 3Q1907.D 03/15/19 13:50. Area is AVERAGE of initial cal points.
 (b) Check Std Limit = -50 to +50% of initial cal area.
 (c) Upper Limit = +50% of initial standard area; Retention time +1 minutes of check standard.
 (d) Lower Limit = -50% of initial standard area; Retention time -1 minutes of check standard.

Internal Standard Area Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Check Std: S3Q52-CC52	Injection Date: 03/15/19
Lab File ID: 3Q1919.D	Injection Time: 16:54
Instrument ID: GCMS3Q	Method: EPA 537 MOD

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Initial Cal ^a	147216	3.56	40477	6.60	184585	6.62	59171	7.19	19833	7.75	170940	8.41
Check Std ^b	138449	3.57	39095	6.61	178559	6.63	55229	7.20	19748	7.75	170603	8.42
Upper Limit ^c	220824	4.57	60716	7.61	276878	7.63	88757	8.20	29750	8.75	256410	9.42
Lower Limit ^d	73608	2.57	20239	5.61	92293	5.63	29586	6.20	9917	6.75	85470	7.42

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
FA62248-6	145480	3.58	52398	6.62	229654	6.64	59755	7.22	26958	7.75	213865	8.42

- IS 1** = 13C3-PFPeA
- IS 2** = 13C2-6:2FTS
- IS 3** = 13C2-PFOA
- IS 4** = 13C4-PFOS
- IS 5** = d3-MeFOSAA
- IS 6** = 13C2-PFDoDA

(a) Initial Cal is: S3Q52-ICC52 3Q1907.D 03/15/19 13:50. Area is AVERAGE of initial cal points.

(b) Check Std Limit = -50 to +50% of initial cal area.

(c) Upper Limit = +50% of initial standard area; Retention time +1 minutes of check standard.

(d) Lower Limit = -50% of initial standard area; Retention time -1 minutes of check standard.

Internal Standard Area Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Check Std: S3Q53-CC52	Injection Date: 03/18/19
Lab File ID: 3Q1938.D	Injection Time: 11:36
Instrument ID: GCMS3Q	Method: EPA 537 MOD

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Initial Cal ^a	147216	3.56	40477	6.60	184585	6.62	59171	7.19	19833	7.75	170940	8.41
Check Std ^b	103425	3.55	29627	6.59	135004	6.60	45114	7.18	14586	7.74	128194	8.41
Upper Limit ^c	220824	4.55	60716	7.59	276878	7.60	88757	8.18	29750	8.74	256410	9.41
Lower Limit ^d	73608	2.55	20239	5.59	92293	5.60	29586	6.18	9917	6.74	85470	7.41

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
FA62248-1 ^e	115283	3.55	48603	6.59	153413	6.60	43162	7.18	17195	7.74	141926	8.41
FA62248-1	118022	3.56	36358	6.59	159151	6.60	49044	7.19	16626	7.74	141187	8.41
OP74166-MS	120879	3.56	38123	6.60	165397	6.62	49981	7.19	17552	7.74	147818	8.41
FA62248-2 ^e	115632	3.55	47055	6.59	155813	6.60	43740	7.18	19372	7.74	154669	8.39
FA62248-2	120908	3.56	39342	6.60	164219	6.62	48617	7.19	18669	7.74	149225	8.41
FA62248-4	116884	3.56	34174	6.60	167752	6.62	50463	7.19	18491	7.74	197299	8.32
FA62248-7 ^e	120283	3.56	51832	6.59	165193	6.60	43661	7.19	20649	7.74	157572	8.41
FA62248-7	127739	3.56	41144	6.60	177901	6.62	51805	7.19	20009	7.75	163418	8.42
OP74166-DUP	122643	3.56	39027	6.60	169129	6.62	50284	7.19	18979	7.75	162325	8.42

- IS 1 = 13C3-PFPeA
- IS 2 = 13C2-6:2FTS
- IS 3 = 13C2-PFOA
- IS 4 = 13C4-PFOS
- IS 5 = d3-MeFOSAA
- IS 6 = 13C2-PFD_oDA

- (a) Initial Cal is: S3Q52-ICC52 3Q1907.D 03/15/19 13:50. Area is AVERAGE of initial cal points.
- (b) Check Std Limit = -50 to +50% of initial cal area.
- (c) Upper Limit = +50% of initial standard area; Retention time +1 minutes of check standard.
- (d) Lower Limit = -50% of initial standard area; Retention time -1 minutes of check standard.
- (e) Dilution required due to matrix interference (internal standard failure).

Surrogate Recovery Summary

Job Number: FA62248
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Method: EPA 537 MOD	Matrix: AQ
----------------------------	-------------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
FA62248-1	3Q1939.D	99	101	92
FA62248-1	3Q1940.D	0* a	0* a	0* a
FA62248-2	3Q1942.D	95	122	97
FA62248-2	3Q1943.D	99	110	98
FA62248-3	3Q1918.D	99	117	99
FA62248-4	3Q1944.D	99	114	101
FA62248-6	3Q1923.D	94	94	83
FA62248-7	3Q1945.D	96	111	88
FA62248-7	3Q1946.D	0* a	0* a	0* a
OP74166-BS	3Q1913.D	113	115	92
OP74166-DUP	3Q1947.D	0* a	0* a	0* a
OP74166-MB	3Q1914.D	105	111	93
OP74166-MS	3Q1941.D	0* a	0* a	0* a

Surrogate Compounds	Recovery Limits
S1 = 13C2-PFHxA	61-134%
S2 = 13C2-PFDA	62-128%
S3 = d5-EtFOSAA	57-135%

(a) Outside control limits due to dilution.

Initial Calibration Summary

Job Number: FA62248 Sample: S3Q52-ICC52
 Account: AMECORP Wood Environment & Infrastructure Soln. Lab FileID: 3Q1907.D
 Project: Davis Monthan AFB, AZ

Initial Calibration Report

Method Path	D:\MassHunter\Methods													
Method File	537_GENX_031519_S3Q52.quantmethod.xml													
Batch Name	D:\MassHunter\Data\0315_list_genx_S3Q52\QuantResults\S3Q52.batch.bin													
Last Calib Update	3/18/2019 9:57:10 AM													
Level Name	Calibration Files	Acq. Date-Time	Level Last Update Time	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
1	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d	3/15/2019 12:33:15 PM	3/18/2019 9:57:10 AM											
2	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d	3/15/2019 12:49:07 PM	3/18/2019 9:57:10 AM											
3	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d	3/15/2019 1:04:28 PM	3/18/2019 9:57:10 AM											
4	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d	3/15/2019 1:19:48 PM	3/18/2019 9:57:10 AM											
5	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d	3/15/2019 1:35:09 PM	3/18/2019 9:57:10 AM											
6	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d	3/15/2019 1:50:29 PM	3/18/2019 9:57:10 AM											
7	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d	3/15/2019 2:05:49 PM	3/18/2019 9:57:10 AM											
8	D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d	3/15/2019 2:21:09 PM	3/18/2019 9:57:10 AM											
Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD			
I 13C2-6:2FTS	Avg RF	1.3490	1.3007	1.2948	1.2628	1.2809	1.2387	1.2099	1.1101	1.2559	5.754			
T 4:2FTS	Avg RF	1.2489	1.0888	1.0761	1.0581	1.0376	1.0220	0.9803	0.8696	1.0477	10.210			
T 6:2FTS	Avg RF	0.7049	0.6793	0.7009	0.6848	0.6816	0.6561	0.6281	0.5515	0.6609	7.658			
I 13C2-PFDODA	Linear	0.9362	0.8884	0.8750	0.8520	0.8807	0.8790	0.8778	0.8661	0.8819	2.781			
T PFUnDA	Linear	0.9584	0.9212	0.9193	0.9107	0.9339	0.9407	0.9614	0.9599	0.9382	2.148			
T PFDODA	Linear	1.1029	1.0239	1.0103	1.0163	1.0428	1.0400	1.0599	1.0516	1.0435	2.829			
T PFTfDA	Linear	1.2854	1.2292	1.2054	1.2322	1.2631	1.2238	1.2777	1.2482	1.2456	2.243			
T PFTeDA	Linear	0.3404	0.3231	0.3193	0.3182	0.3243	0.3320	0.3514	0.3643	0.3341	4.993			
I 13C2-PFOA	Linear	1.0983	1.0354	1.0510	1.0462	1.0693	1.0805	1.1305	1.1501	1.0827	3.794			
T PFBA	Quadratic	0.5150	0.5102	0.4866	0.4878	0.5075	0.5101	0.5334	0.5446	0.5119	3.900			
S 13C2-PFHA	Linear	0.9099	0.0838	0.0845	0.0821	0.0823	0.0808	0.0786	0.0752	0.0823	5.586			
T PFHxA	Quadratic	0.2729	0.2681	0.2710	0.2671	0.2670	0.2615	0.2521	0.2422	0.2628	4.002			
S 13C3-HFO-DA	Quadratic	1.4747	1.3652	1.3564	1.3899	1.4066	1.4249	1.4945	1.5097	1.4277	4.123			
T PFHpA	Linear	2.0036	1.9203	1.9629	1.9440	1.9922	2.0184	2.1181	2.1643	2.0155	4.206			
T ADONA	Linear	0.8669	0.8205	0.8359	0.8278	0.8508	0.8553	0.8881	0.8852	0.8538	2.953			
T PFOA	Linear	0.8966	0.8929	0.8970	0.8983	0.9097	0.9133	0.9550	0.9484	0.9139	2.670			
T PFNA	Linear	0.1992	0.1843	0.2015	0.1947	0.1997	0.2003	0.2108	0.2109	0.2002	4.283			
T 9C-PFONS	Linear	1.0191	1.0510	1.0488	1.0409	1.0624	1.0469	1.0480	0.9990	1.0395	1.968			
S 13C2-PFDA	Quadratic	0.7553	0.7774	0.7604	0.7718	0.7874	0.7798	0.7819	0.7477	0.7702	1.838			
T PFDA	Linear	0.8098	0.7692	0.7667	0.7604	0.7950	0.7995	0.8313	0.8246	0.7946	3.395			
T 11C-PF3OLds	Linear	1.4313	1.3402	1.3163	1.3185	1.3459	1.3596	1.3884	1.4115	1.3640	3.115			
I 13C3-PFPeA	Linear	0.3066	0.2881	0.2776	0.2736	0.2755	0.2763	0.2823	0.2814	0.2827	3.799			
T PFPeA	Linear													
T PFPeS	Linear													
I 13C4-PFOS	Linear													



Initial Calibration Summary

Job Number: FA62248

Account: AMECORP Wood Environment & Infrastructure Soln.

Project: Davis Monthan AFB, AZ

Sample: S3Q52-ICC52

Lab FileID: 3Q1907.D

Initial Calibration Report

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
T PFBS	Linear	1.1967	1.0860	1.1288	1.1032	1.1104	1.1402	1.1790	1.2197	1.1455	4.191
T PFHxS	Linear	0.9347	0.8642	0.8610	0.8542	0.8516	0.8887	0.9061	0.9014	0.8827	3.380
T PFHpS	Linear	0.8043	0.7703	0.7738	0.7650	0.7659	0.7816	0.7959	0.7969	0.7817	1.970
T PFOS	Linear	1.1899	0.9994	1.0861	1.1077	1.1316	1.1674	1.1919	1.2238	1.1372	6.365
T PFNS	Linear	0.7173	0.6697	0.7003	0.6662	0.6710	0.6795	0.6817	0.6691	0.6819	2.644
T PFDS	Linear	0.1650	0.1814	0.1726	0.1682	0.1723	0.1777	0.1727	0.1709	0.1726	2.971
I d3-MeFOSAA											
T FOSA	Quadratic	5.1283	4.4674	4.5560	4.5902	4.8195	4.7552	4.5786	4.2488	4.6430	5.640
T MeFOSAA	Linear	1.4195	0.9643	1.1184	1.0805	1.1511	1.1222	1.1652	1.1377	1.1449	11.139
S d5-EFOSAA	Linear	1.3220	1.1240	1.1900	1.1238	1.1971	1.1771	1.1874	1.1461	1.1834	5.341
T EFOSAA	Linear	1.1153	0.8229	0.9424	0.9211	0.9711	0.9435	0.9667	0.9227	0.9507	8.515

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Summary

Job Number: FA62248

Account: AMECORP Wood Environment & Infrastructure Soln.

Project: Davis Monthan AFB, AZ

Sample:

S3Q52-ICC52

Lab FileID:

3Q1907.D

Initial Calibration Report

Compounds with Curve fitting not using Avg Response Factor:

Compound	Curve Fit	Curve Fit Formula	Curve Fit R2
T PFBA	Linear	$y = 0.360432 * x$	0.999246
T PFPEA	Linear	$y = 1.404738 * x$	0.999854
T PFBS	Linear	$y = 1.208367 * x$	0.999484
S 13C2-PFHxA	Quadratic	$y = 0.011830 * x^2 + 1.091820 * x$	0.999949
T PFHxA	Linear	$y = 0.540987 * x$	0.999666
T PFPEs	Linear	$y = 0.281321 * x$	0.999974
S 13C3-HFO-DA	Quadratic	$y = -2.806489E-004 * x^2 + 0.082191 * x$	0.999997
T HFO-DA	Quadratic	$y = -8.768006E-004 * x^2 + 0.264037 * x$	0.999986
T PFHpA	Linear	$y = 1.503071 * x$	0.999775
T PFHxS	Linear	$y = 0.901450 * x$	0.999939
T ADONA	Linear	$y = 2.149112 * x$	0.999621
T PFOA	Linear	$y = 0.884409 * x$	0.999914
T PFHpS	Linear	$y = 0.795944 * x$	0.999962
T PFOS	Linear	$y = 1.214955 * x$	0.999680
T PFNA	Linear	$y = 0.948188 * x$	0.999893
T FOSA	Quadratic	$y = -0.128088 * x^2 + 4.890179 * x$	0.999983
T 9C-PF3ONS	Linear	$y = 0.210455 * x$	0.999837
T PFNS	Linear	$y = 0.671887 * x$	0.999910
S 13C2-PFDA	Quadratic	$y = -0.016656 * x^2 + 1.082960 * x$	0.999963
T PFDA	Linear	$y = 0.755625 * x$	0.999446
T MeFOSAA	Linear	$y = 1.142479 * x$	0.999837
S d5-EFOSAA	Linear	$y = 1.155383 * x$	0.999664
T EtFOSAA	Linear	$y = 0.932110 * x$	0.999445
T PFDS	Linear	$y = 0.171425 * x$	0.999907
T PFnDA	Linear	$y = 0.868803 * x$	0.999947
T 11Cl-PF3OUdS	Linear	$y = 0.824707 * x$	0.999903
T PFDoDA	Linear	$y = 0.959305 * x$	0.999964
T PFTfDA	Linear	$y = 1.052655 * x$	0.999973
T PFTeDA	Linear	$y = 1.253166 * x$	0.999843

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Verification**Job Number:** FA62248**Sample:** S3Q52-ICV52**Account:** AMECORP Wood Environment & Infrastructure Soln.**Lab FileID:** 3Q1910.D**Project:** Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0315_list_genx_S3Q52\S3Q52.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1910

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	17.942	-10.3	89.7
6:2FTS	20.000	18.495	-7.5	92.5
8:2FTS	20.000	18.817	-5.9	94.1
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	20.601	3.0	103.0
FOSA	20.000	19.963	-0.2	99.8
MeFOSAA	20.000	19.695	-1.5	98.5
PFBA	20.000	17.841	-10.8	89.2
PFBS	20.000	15.496	-22.5	77.5
PFDA	20.000	19.076	-4.6	95.4
PFDoDA	20.000	19.926	-0.4	99.6
PFDS	20.000	18.172	-9.1	90.9
PFHpA	20.000	19.260	-3.7	96.3
PFHpS	20.000	18.070	-9.7	90.3
PFHxA	20.000	16.523	-17.4	82.6
PFHxS	20.000	16.430	-17.9	82.1
PFNA	20.000	17.644	-11.8	88.2
PFNS	20.000	18.853	-5.7	94.3
PFOA	20.000	19.027	-4.9	95.1
PFOS	20.000	18.574	-7.1	92.9
PFPeA	20.000	17.942	-10.3	89.7
PFPeS	20.000	15.834	-20.8	79.2
PFTeDA	20.000	17.911	-10.4	89.6
PFTTrDA	20.000	21.267	6.3	106.3
PFUnDA	20.000	19.996	0.0	100.0
ADONA	20.000	0.000	# -100.0	0.0
9C1-PF3ONS	20.000	0.000	# -100.0	0.0
11C1-PF3OUdS	20.000	0.000	# -100.0	0.0
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0

Initial Calibration Verification

Job Number: FA62248

Sample: S3Q52-ICV52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1910.D

Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	0.000	#	-100.0	0.0
---------	---------	-------	---	--------	-----

CC Criteria: +/- 25%

Initial Calibration Verification**Job Number:** FA62248**Sample:** S3Q52-ICV52**Account:** AMECORP Wood Environment & Infrastructure Soln.**Lab FileID:** 3Q1911.D**Project:** Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0315_list_genx_S3Q52\S3Q52.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1911

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	0.000	# -100.0	0.0
6:2FTS	20.000	0.000	# -100.0	0.0
8:2FTS	20.000	0.000	# -100.0	0.0
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	17.350	-13.2	86.8
FOSA	20.000	0.000	# -100.0	0.0
MeFOSAA	20.000	16.401	-18.0	82.0
PFBA	20.000	0.000	# -100.0	0.0
PFBS	20.000	17.251	-13.7	86.3
PFDA	20.000	19.960	-0.2	99.8
PFDoDA	20.000	17.981	-10.1	89.9
PFDS	20.000	0.000	# -100.0	0.0
PFHpA	20.000	17.414	-12.9	87.1
PFHpS	20.000	0.000	# -100.0	0.0
PFHxA	20.000	16.932	-15.3	84.7
PFHxS	20.000	18.475	-7.6	92.4
PFNA	20.000	18.574	-7.1	92.9
PFNS	20.000	0.000	# -100.0	0.0
PFOA	20.000	18.608	-7.0	93.0
PFOS	20.000	18.006	-10.0	90.0
PFPeA	20.000	0.000	# -100.0	0.0
PFPeS	20.000	0.000	# -100.0	0.0
PFTeDA	20.000	18.353	-8.2	91.8
PFTTrDA	20.000	18.762	-6.2	93.8
PFUnDA	20.000	19.205	-4.0	96.0
ADONA	20.000	17.187	-14.1	85.9
9Cl-PF3ONS	20.000	18.088	-9.6	90.4
11Cl-PF3OUdS	20.000	18.645	-6.8	93.2
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0

Initial Calibration Verification

Job Number: FA62248

Sample: S3Q52-ICV52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1911.D

Project: Davis Monthan AFB, AZ

HFPO-DA	20.000	19.799	-1.1	98.9
---------	--------	--------	------	------

CC Criteria: +/- 25%

Initial Calibration Verification

Job Number: FA62248

Sample: S3Q52-ICV52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1912.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0315_list_genx_S3Q52\S3Q52.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1912

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	0.000	# -100.0	0.0
6:2FTS	20.000	0.000	# -100.0	0.0
8:2FTS	20.000	0.000	# -100.0	0.0
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	15.777	-21.1	78.9
FOSA	20.000	0.000	# -100.0	0.0
MeFOSAA	20.000	16.796	-16.0	84.0
PFBA	20.000	0.000	# -100.0	0.0
PFBS	20.000	0.000	# -100.0	0.0
PFDA	20.000	0.000	# -100.0	0.0
PFDoDA	20.000	0.000	# -100.0	0.0
PFDS	20.000	0.000	# -100.0	0.0
PFHpA	20.000	0.000	# -100.0	0.0
PFHpS	20.000	0.000	# -100.0	0.0
PFHxA	20.000	0.000	# -100.0	0.0
PFHxS	20.000	0.000	# -100.0	0.0
PFNA	20.000	0.000	# -100.0	0.0
PFNS	20.000	0.000	# -100.0	0.0
PFOA	20.000	15.985	-20.1	79.9
PFOS	20.000	18.127	-9.4	90.6
PFPeA	20.000	0.000	# -100.0	0.0
PFPeS	20.000	0.000	# -100.0	0.0
PFTeDA	20.000	0.000	# -100.0	0.0
PFTTrDA	20.000	0.000	# -100.0	0.0
PFUnDA	20.000	0.000	# -100.0	0.0
ADONA	20.000	0.000	# -100.0	0.0
9Cl-PF3ONS	20.000	0.000	# -100.0	0.0
11Cl-PF3OUdS	20.000	0.000	# -100.0	0.0
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0

Initial Calibration Verification

Job Number: FA62248

Sample: S3Q52-ICV52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1912.D

Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	0.000	#	-100.0	0.0
---------	---------	-------	---	--------	-----

CC Criteria: +/- 25%

Continuing Calibration Summary

Job Number: FA62248

Sample: S3Q52-CC52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1919.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0315_list_genx_S3Q52\S3Q52.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1919

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.021	0.1	100.1
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	19.324	-3.4	96.6
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	19.446	-2.8	97.2
6:2FTS	20.000	19.581	-2.1	97.9
8:2FTS	20.000	20.149	0.7	100.7
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	19.882	-0.6	99.4
EtFOSAA	20.000	20.351	1.8	101.8
FOSA	20.000	18.905	-5.5	94.5
MeFOSAA	20.000	19.359	-3.2	96.8
PFBA	20.000	18.148	-9.3	90.7
PFBS	20.000	18.824	-5.9	94.1
PFDA	20.000	21.263	6.3	106.3
PFDoDA	20.000	19.805	-1.0	99.0
PFDS	20.000	20.813	4.1	104.1
PFHpA	20.000	18.736	-6.3	93.7
PFHpS	20.000	19.682	-1.6	98.4
PFHxA	20.000	18.664	-6.7	93.3
PFHxS	20.000	19.518	-2.4	97.6
PFNA	20.000	19.286	-3.6	96.4
PFNS	20.000	20.710	3.5	103.5
PFOA	20.000	19.567	-2.2	97.8
PFOS	20.000	19.209	-4.0	96.0
PFPeA	20.000	19.444	-2.8	97.2
PFPeS	20.000	19.639	-1.8	98.2
PFTeDA	20.000	19.499	-2.5	97.5
PFTTrDA	20.000	19.925	-0.4	99.6
PFUnDA	20.000	20.393	2.0	102.0
ADONA	20.000	18.535	-7.3	92.7
9Cl-PF3ONS	20.000	18.892	-5.5	94.5
11Cl-PF3OUdS	20.000	18.942	-5.3	94.7
13C3-HFPO-DA	100.000	95.491	-4.5	95.5

Continuing Calibration Summary

Job Number: FA62248 **Sample:** S3Q52-CC52
Account: AMECORP Wood Environment & Infrastructure Soln. **Lab FileID:** 3Q1919.D
Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	96.189	-3.8	96.2
---------	---------	--------	------	------

CC Criteria: +/- 25%

Continuing Calibration Summary**Job Number:** FA62248**Sample:** S3Q52-CC52**Account:** AMECORP Wood Environment & Infrastructure Soln.**Lab FileID:** 3Q1926.D**Project:** Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0315_list_genx_S3Q52\S3Q52.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1926

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.183	0.9	100.9
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	19.365	-3.2	96.8
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	19.799	-1.0	99.0
6:2FTS	20.000	19.638	-1.8	98.2
8:2FTS	20.000	20.305	1.5	101.5
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	21.282	6.4	106.4
EtFOSAA	20.000	21.368	6.8	106.8
FOSA	20.000	19.815	-0.9	99.1
MeFOSAA	20.000	20.399	2.0	102.0
PFBA	20.000	18.143	-9.3	90.7
PFBS	20.000	18.998	-5.0	95.0
PFDA	20.000	21.173	5.9	105.9
PFDoDA	20.000	19.333	-3.3	96.7
PFDS	20.000	20.403	2.0	102.0
PFHpA	20.000	18.714	-6.4	93.6
PFHpS	20.000	19.730	-1.3	98.7
PFHxA	20.000	18.603	-7.0	93.0
PFHxS	20.000	19.589	-2.1	97.9
PFNA	20.000	19.279	-3.6	96.4
PFNS	20.000	20.842	4.2	104.2
PFOA	20.000	19.357	-3.2	96.8
PFOS	20.000	19.197	-4.0	96.0
PFPeA	20.000	19.242	-3.8	96.2
PFPeS	20.000	19.632	-1.8	98.2
PFTeDA	20.000	18.958	-5.2	94.8
PFTTrDA	20.000	19.765	-1.2	98.8
PFUnDA	20.000	20.406	2.0	102.0
ADONA	20.000	18.459	-7.7	92.3
9Cl-PF3ONS	20.000	18.303	-8.5	91.5
11Cl-PF3OUdS	20.000	18.914	-5.4	94.6
13C3-HFPO-DA	100.000	94.092	-5.9	94.1

Continuing Calibration Summary

Job Number: FA62248

Sample: S3Q52-CC52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1926.D

Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	95.943	-4.1	95.9
---------	---------	--------	------	------

CC Criteria: +/- 25%

Continuing Calibration Summary

Job Number: FA62248

Sample: S3Q53-CC52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1938.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0318_list_genx_S3Q53\s3q53.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1938

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.314	1.6	101.6
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	19.871	-0.6	99.4
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	19.738	-1.3	98.7
6:2FTS	20.000	19.773	-1.1	98.9
8:2FTS	20.000	20.226	1.1	101.1
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	19.973	-0.1	99.9
EtFOSAA	20.000	20.070	0.3	100.3
FOSA	20.000	19.608	-2.0	98.0
MeFOSAA	20.000	19.559	-2.2	97.8
PFBA	20.000	16.467	-17.7	82.3
PFBS	20.000	18.530	-7.4	92.6
PFDA	20.000	20.967	4.8	104.8
PFDoDA	20.000	19.694	-1.5	98.5
PFDS	20.000	20.266	1.3	101.3
PFHpA	20.000	19.824	-0.9	99.1
PFHpS	20.000	19.402	-3.0	97.0
PFHxA	20.000	19.470	-2.7	97.3
PFHxS	20.000	19.129	-4.4	95.6
PFNA	20.000	20.708	3.5	103.5
PFNS	20.000	20.752	3.8	103.8
PFOA	20.000	19.306	-3.5	96.5
PFOS	20.000	18.803	-6.0	94.0
PFPeA	20.000	21.381	6.9	106.9
PFPeS	20.000	21.178	5.9	105.9
PFTeDA	20.000	20.007	0.0	100.0
PFTTrDA	20.000	19.902	-0.5	99.5
PFUnDA	20.000	20.159	0.8	100.8
ADONA	20.000	19.283	-3.6	96.4
9Cl-PF3ONS	20.000	18.998	-5.0	95.0
11Cl-PF3OUdS	20.000	21.308	6.5	106.5
13C3-HFPO-DA	100.000	102.067	2.1	102.1

Continuing Calibration Summary

Job Number: FA62248

Sample: S3Q53-CC52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1938.D

Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	103.092	3.1	103.1
---------	---------	---------	-----	-------

CC Criteria: +/- 25%

Continuing Calibration Summary

Job Number: FA62248

Sample: S3Q53-CC52

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q1948.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0318_list_genx_S3Q53\s3q53.batch.bin

Level ID: Calibration File

1:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1902.d
 2:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1903.d
 3:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1904.d
 4:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1905.d
 5:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1906.d
 6:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1907.d
 7:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1908.d
 8:D:\MassHunter\Data\0315_list_genx_S3Q52\3q1909.d

Data File: 3q1948

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.916	4.6	104.6
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	19.945	-0.3	99.7
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	19.642	-1.8	98.2
6:2FTS	20.000	19.998	0.0	100.0
8:2FTS	20.000	20.814	4.1	104.1
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	20.032	0.2	100.2
EtFOSAA	20.000	20.453	2.3	102.3
FOSA	20.000	18.204	-9.0	91.0
MeFOSAA	20.000	19.266	-3.7	96.3
PFBA	20.000	17.397	-13.0	87.0
PFBS	20.000	18.929	-5.4	94.6
PFDA	20.000	21.550	7.7	107.7
PFDoDA	20.000	19.793	-1.0	99.0
PFDS	20.000	20.012	0.1	100.1
PFHpA	20.000	19.780	-1.1	98.9
PFHpS	20.000	19.669	-1.7	98.3
PFHxA	20.000	19.404	-3.0	97.0
PFHxS	20.000	19.438	-2.8	97.2
PFNA	20.000	20.578	2.9	102.9
PFNS	20.000	20.808	4.0	104.0
PFOA	20.000	19.427	-2.9	97.1
PFOS	20.000	19.038	-4.8	95.2
PFPeA	20.000	21.022	5.1	105.1
PFPeS	20.000	20.533	2.7	102.7
PFTeDA	20.000	19.551	-2.2	97.8
PFTTrDA	20.000	19.665	-1.7	98.3
PFUnDA	20.000	20.647	3.2	103.2
ADONA	20.000	19.415	-2.9	97.1
9Cl-PF3ONS	20.000	18.622	-6.9	93.1
11Cl-PF3OUdS	20.000	20.696	3.5	103.5
13C3-HFPO-DA	100.000	103.425	3.4	103.4

Continuing Calibration Summary

Job Number: FA62248 **Sample:** S3Q53-CC52
Account: AMECORP Wood Environment & Infrastructure Soln. **Lab FileID:** 3Q1948.D
Project: Davis Monthan AFB, AZ

HFPO-DA	100.000	103.753	3.8	103.8
---------	---------	---------	-----	-------

CC Criteria: +/- 25%

MS Semi-volatiles

Raw Data

7

Manual Integrations
APPROVED
 (compounds with "m" flag)
Norman Farmer
03/18/19 16:06

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1939.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 11:59:31 AM
 Sample Name : fa62248-1
 Vial : P1-D2
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,120,,1.0,5,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.587	429.0 -> 409.0	48603	20.00 µg/L	-0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	141926	20.00 µg/L	0.000
13C2-PFOA	6.604	415.0 -> 370.0	153413	20.00 µg/L	-0.013
13C3-PFPeA	3.546	266.0 -> 222.0	115283	20.00 µg/L	-0.013
13C4-PFOS	7.179	503.0 -> 80.0	43162	20.00 µg/L	-0.013
d3-MeFOSAA	7.741	573.0 -> 419.0	17195	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	33581	4.06 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 20.3%	
13C2-PFHxA	4.949	315.0 -> 270.0	33184	3.95 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 19.8%	
d5-EtFOSAA	7.878	589.0 -> 419.0	3656	3.68 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 18.4%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.846	327.0 -> 307.0	1499	0.49 µg/L	100
6:2FTS	6.588	427.0 -> 407.0	294191	115.55 µg/L	100
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	7.308	498.0 -> 78.0	132547	32.95 µg/L	m 96
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.676	213.0 -> 169.0	30270	10.95 µg/L	100
PFBS	3.853	299.0 -> 80.0	32686	12.53 µg/L	98
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	5.889	363.0 -> 319.0	207989	18.04 µg/L	m 100
PFHpS	6.609	449.0 -> 80.0	23086	13.44 µg/L	m 96
PFHxA	4.950	313.0 -> 269.0	213981	51.57 µg/L	98
PFHxS	5.932	399.0 -> 80.0	210970	108.44 µg/L	m 97
PFNA	7.196	463.0 -> 419.0	4438	0.61 µg/L	m 99
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	6.605	413.0 -> 369.0	197475	29.11 µg/L	m 97
PFOS	7.180	499.0 -> 80.0	831156	316.99 µg/L	m 78
PFPeA	3.537	263.0 -> 219.0	393819	48.64 µg/L	100
PFPeS	5.080	349.0 -> 80.0	22734	14.02 µg/L	m 97
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.1.1
7

Perfluorinated Compounds by LC/MS/MS

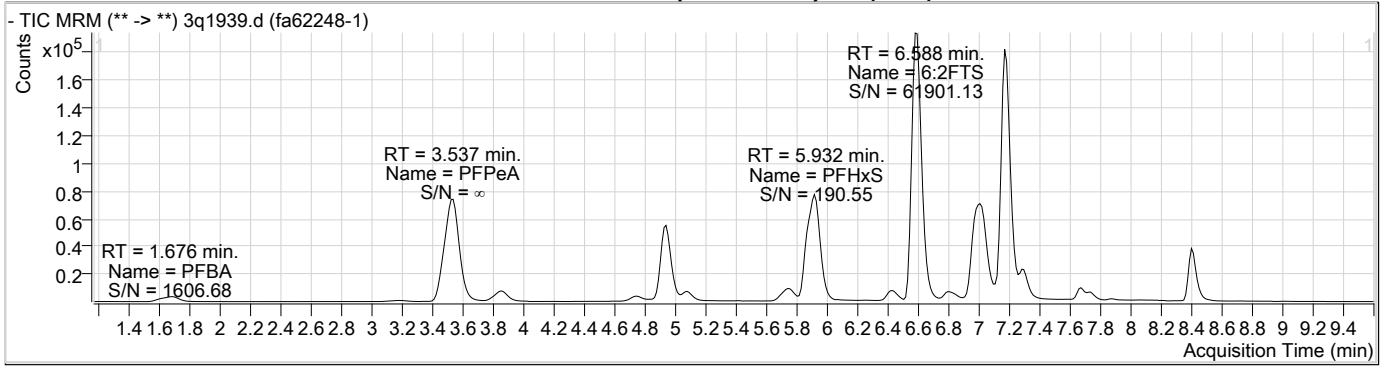
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

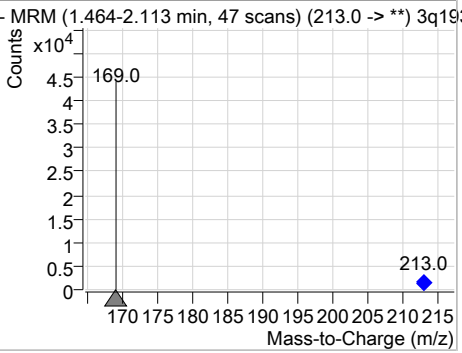
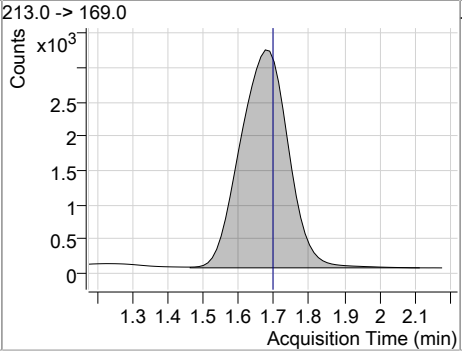
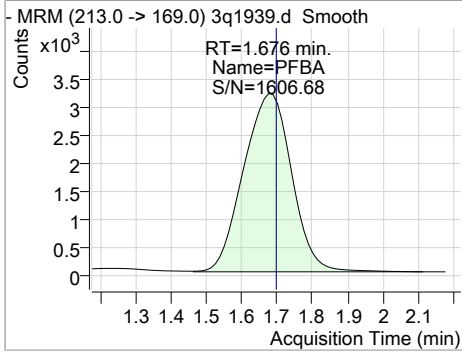
7.1.1
7



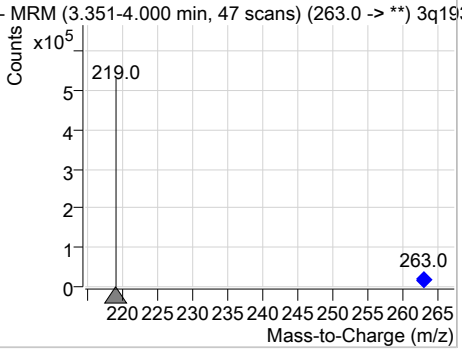
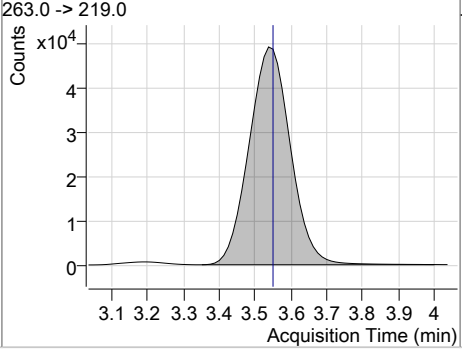
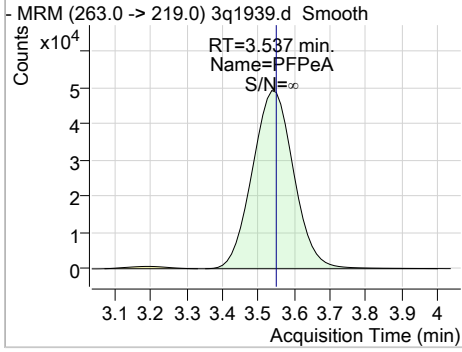
Perfluorinated Compounds by LC/MS/MS



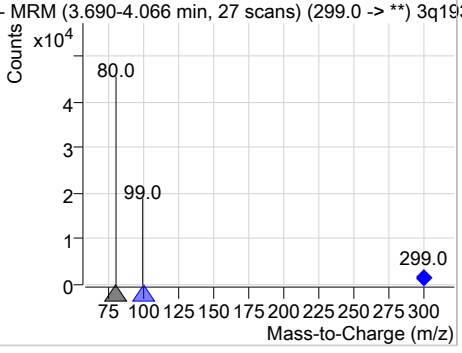
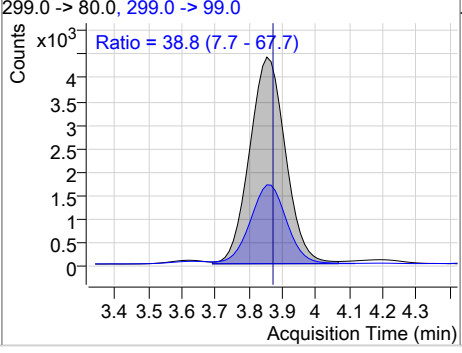
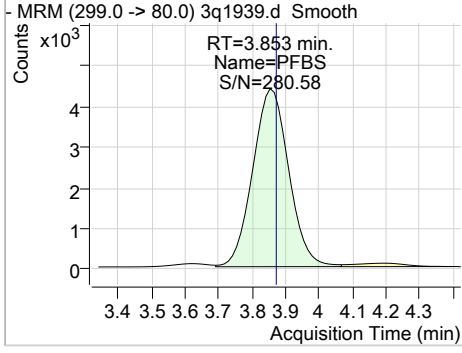
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	10.95	1.68	-0.03	30270				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	48.64	3.54	-0.03	393819				

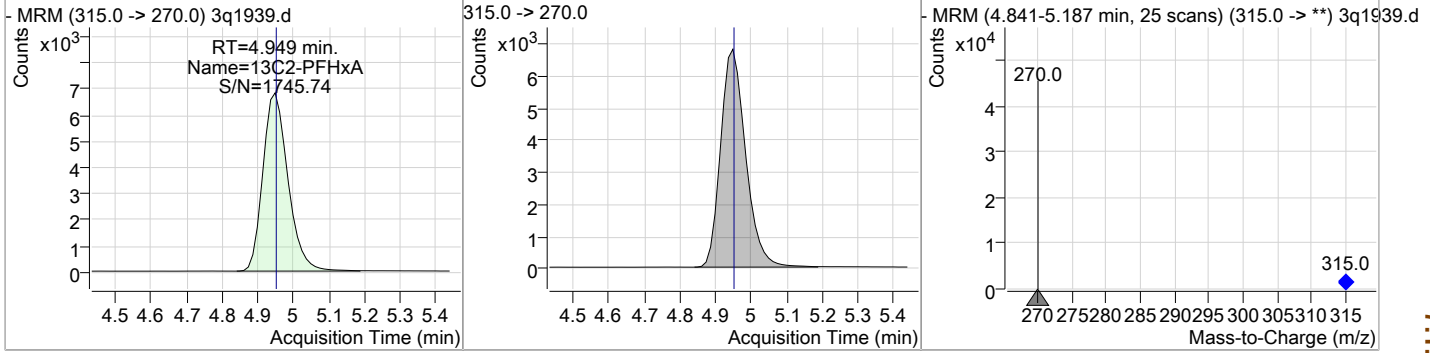


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	12.53	3.85	-0.03	32686	299.0 -> 99.0	38.8	7.7	67.7

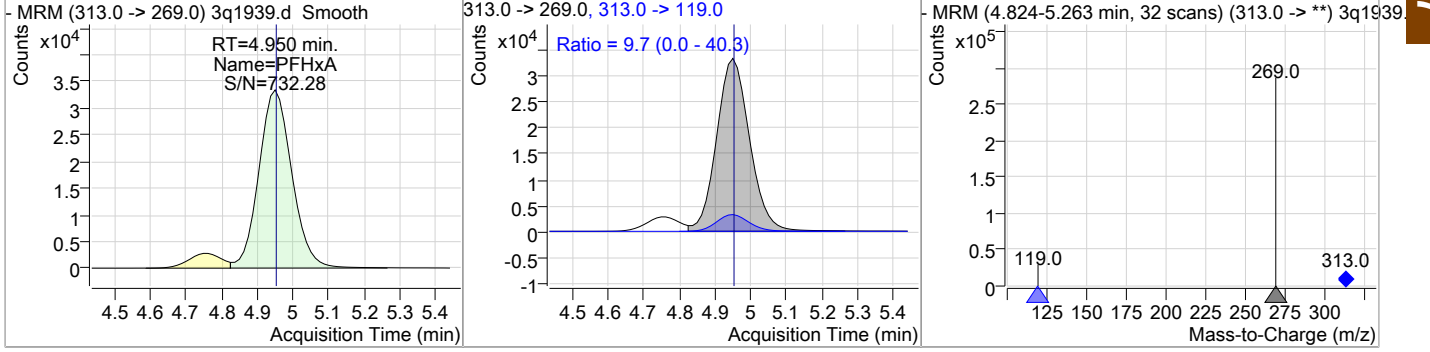


Perfluorinated Compounds by LC/MS/MS

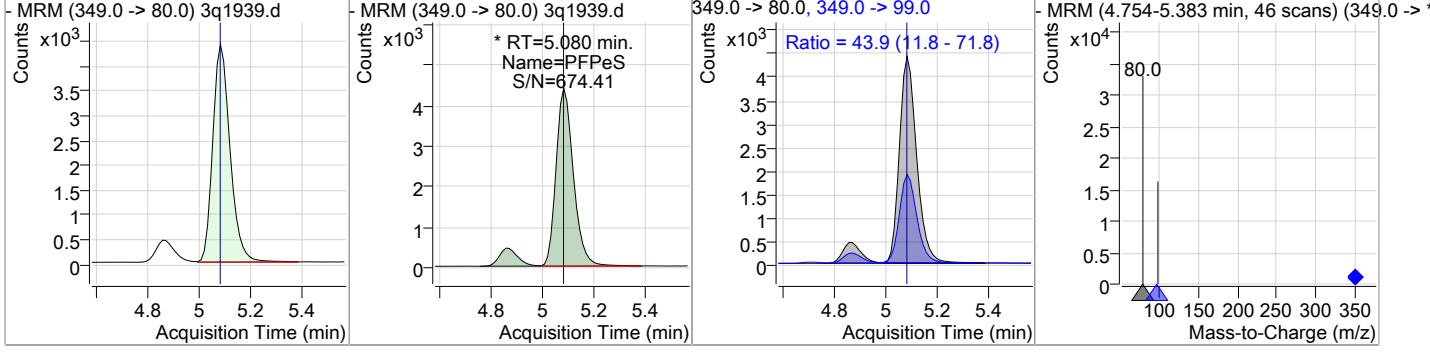
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



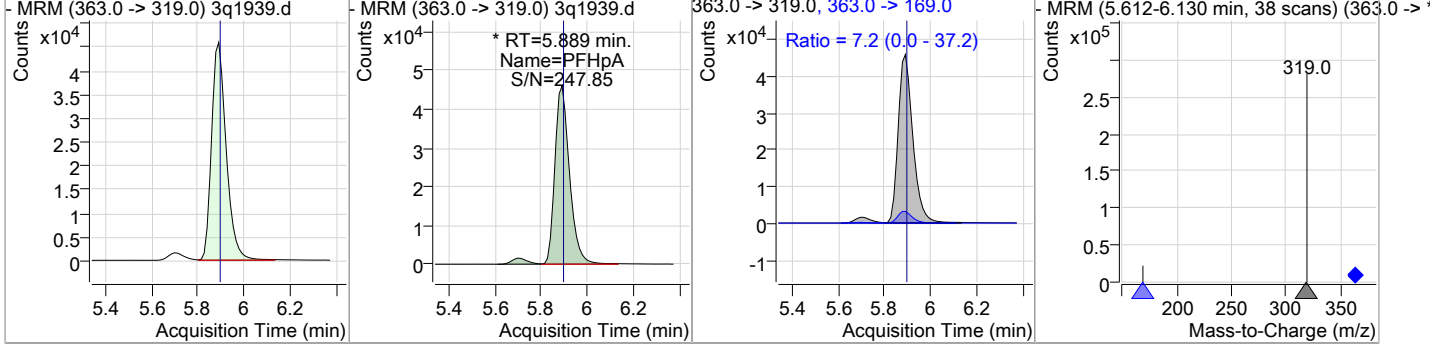
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

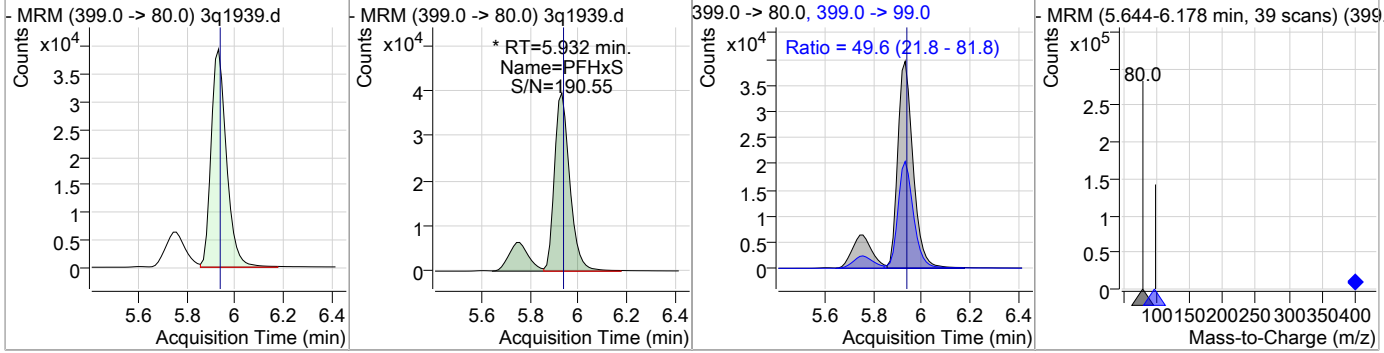


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

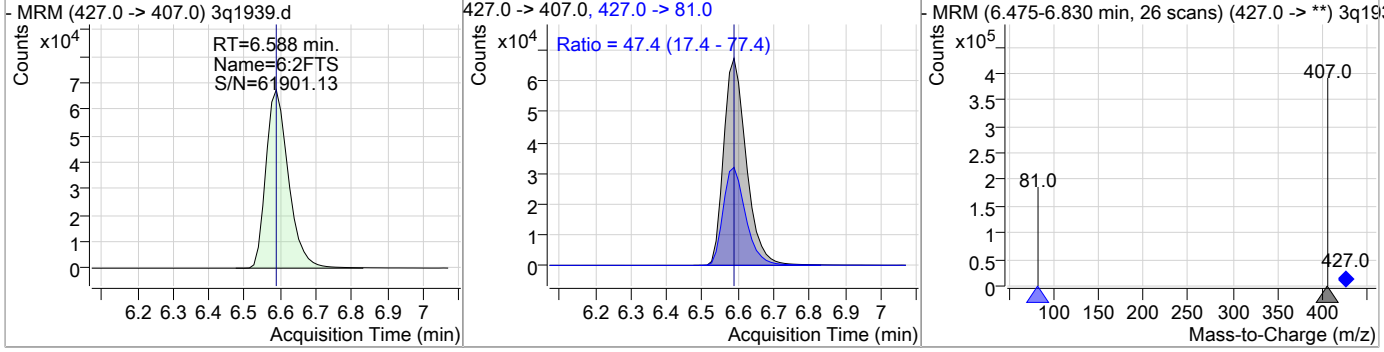


Perfluorinated Compounds by LC/MS/MS

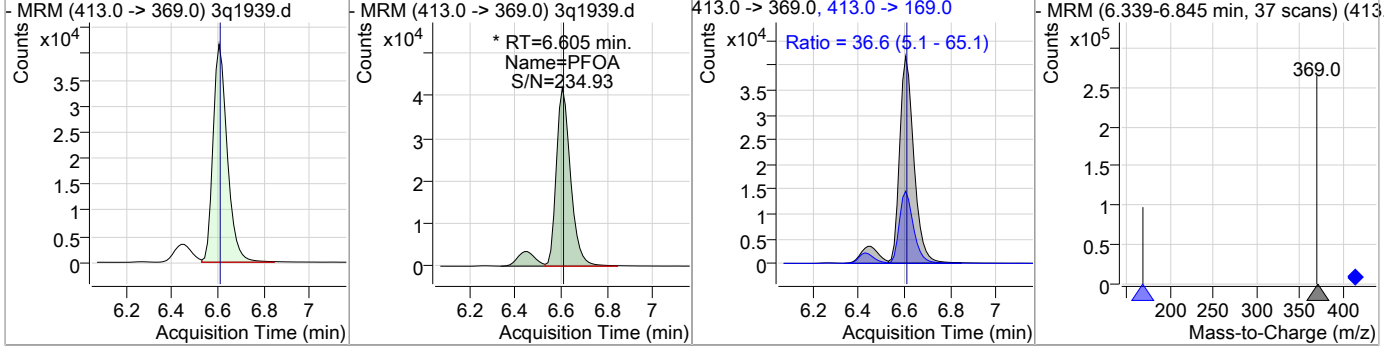
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	108.44	5.93	-0.01	210970 (m)	399.0 -> 99.0	49.6	21.8	81.8



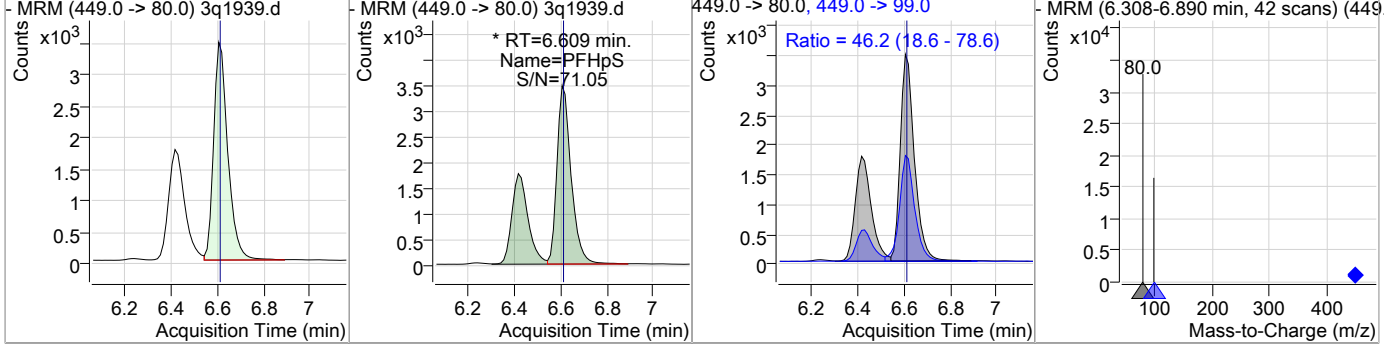
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	115.55	6.59	-0.01	294191	427.0 -> 81.0	47.4	17.4	77.4



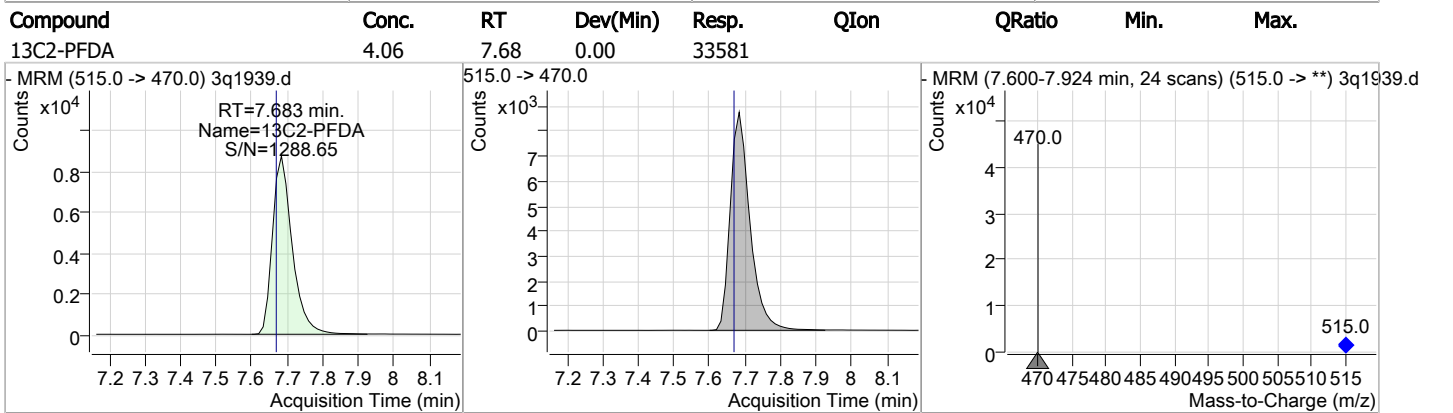
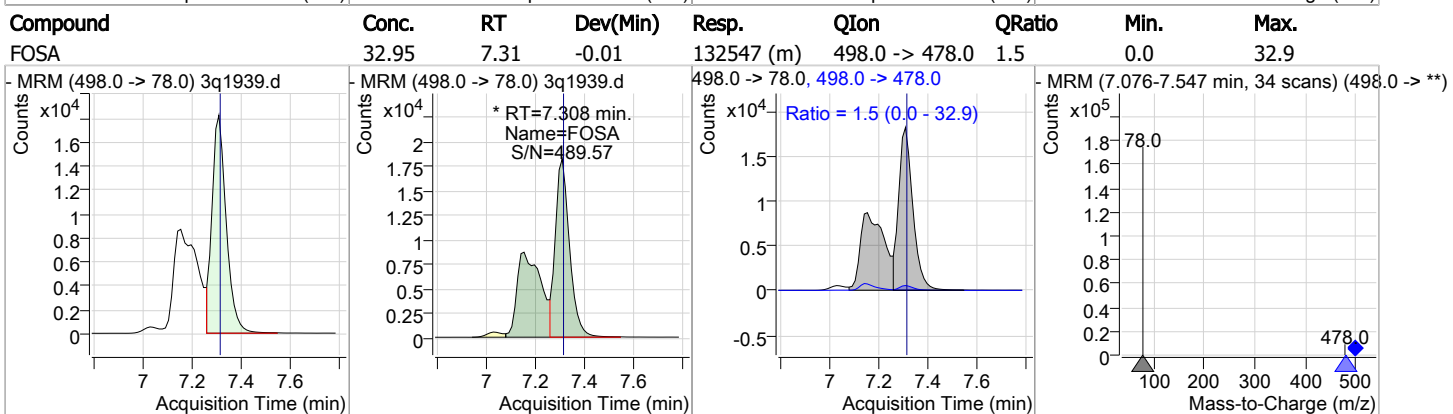
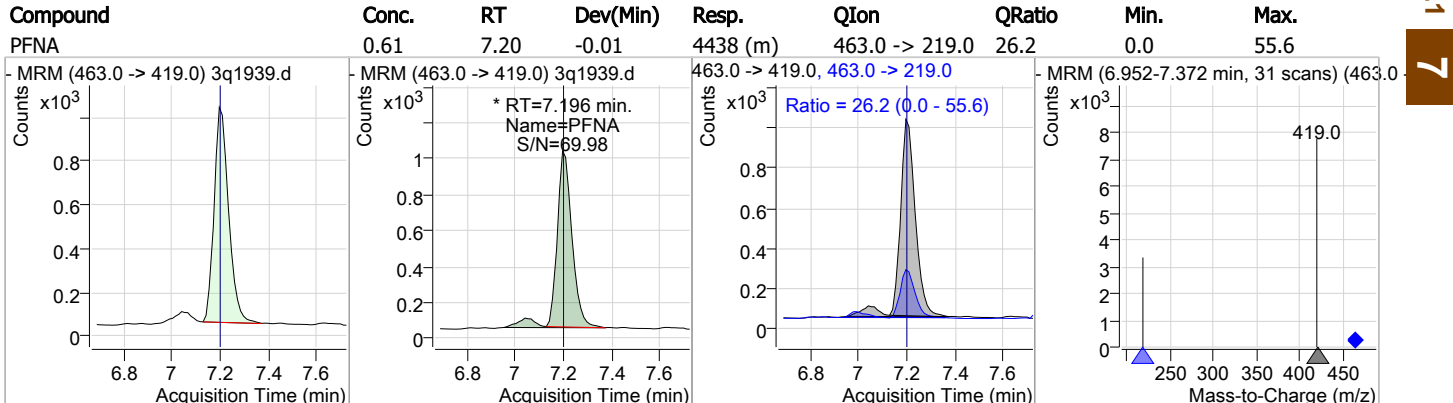
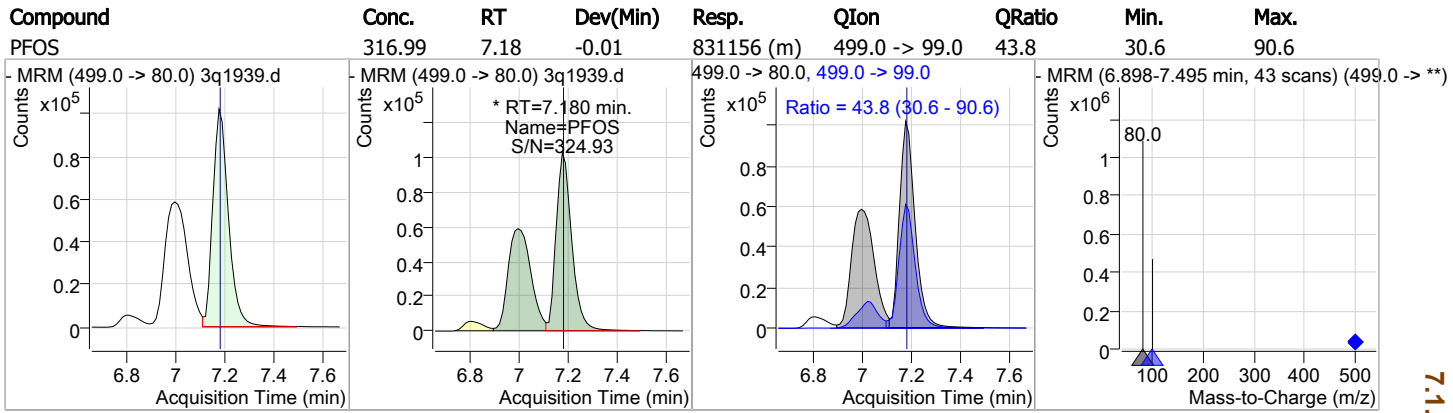
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	29.11	6.61	-0.01	197475 (m)	413.0 -> 169.0	36.6	5.1	65.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	13.44	6.61	-0.01	23086 (m)	449.0 -> 99.0	46.2	18.6	78.6

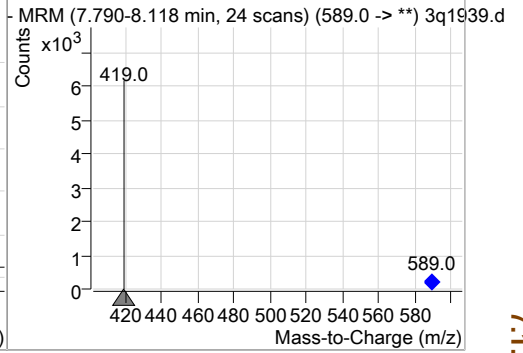
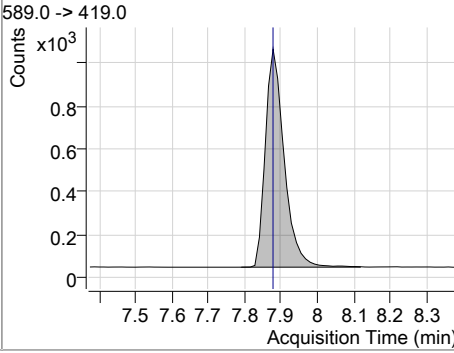
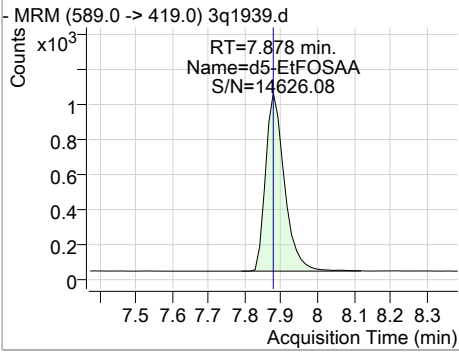


Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	3.68	7.88	-0.01	3656				



7.1.1
7

Manual Integration Approval Summary

Sample Number: FA62248-1 **Method:** EPA 537 MOD
Lab FileID: 3Q1939.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 11:59 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.08	Split peak
Perfluoroheptanoic acid	375-85-9		5.89	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanoic acid	335-67-1		6.61	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.61	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak
Perfluorononanoic acid	375-95-1		7.20	Split peak
PFOSA	754-91-6		7.31	Split peak

7.1.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1940.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 12:14:51 PM
 Sample Name : fa62248-1
 Vial : P1-D3
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,120,,1.0,25,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.587	429.0 -> 409.0	36358	20.00	µg/L	-0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	141187	20.00	µg/L	0.000
13C2-PFOA	6.604	415.0 -> 370.0	159151	20.00	µg/L	-0.013
13C3-PFPeA	3.559	266.0 -> 222.0	118022	20.00	µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	49044	20.00	µg/L	0.000
d3-MeFOSAA	7.741	573.0 -> 419.0	16626	20.00	µg/L	-0.013
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	0	0.00	µg/L	m 0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C2-PFHxA	4.949	315.0 -> 270.0	0	0.00	µg/L	m -0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
d5-EtFOSAA	7.878	589.0 -> 419.0	0	0.00	µg/L	m -0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%			
Target Compounds						
4:2FTS	-	327.0 -> 307.0	-	N.D.		QValue
6:2FTS	6.588	427.0 -> 407.0	56850	29.85	µg/L	99
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	-	584.0 -> 419.0	-	N.D.		
FOSA	7.308	498.0 -> 78.0	26483	6.57	µg/L	m 96
MeFOSAA	-	570.0 -> 419.0	-	N.D.		
PFBA	1.701	213.0 -> 169.0	6015	2.10	µg/L	100
PFBS	3.866	299.0 -> 80.0	6470	2.18	µg/L	97
PFDA	-	513.0 -> 469.0	-	N.D.		
PFDoDA	-	613.0 -> 569.0	-	N.D.		
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	5.889	363.0 -> 319.0	41651	3.48	µg/L	m 100
PFHpS	6.609	449.0 -> 80.0	4713	2.41	µg/L	m 97
PFHxA	4.950	313.0 -> 269.0	42442	9.86	µg/L	98
PFHxS	5.932	399.0 -> 80.0	42031	19.01	µg/L	m 96
PFNA	-	463.0 -> 419.0	-	N.D.		
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.605	413.0 -> 369.0	38886	5.53	µg/L	m 97
PFOS	7.180	499.0 -> 80.0	173955	58.39	µg/L	m 79
PFPeA	3.550	263.0 -> 219.0	76478	9.23	µg/L	100
PFPeS	5.080	349.0 -> 80.0	4471	2.69	µg/L	m 99
PFTeDA	-	713.0 -> 669.0	-	N.D.		
PFTrDA	-	663.0 -> 619.0	-	N.D.		
PFUnDA	-	563.0 -> 519.0	-	N.D.		
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.12

7

Perfluorinated Compounds by LC/MS/MS

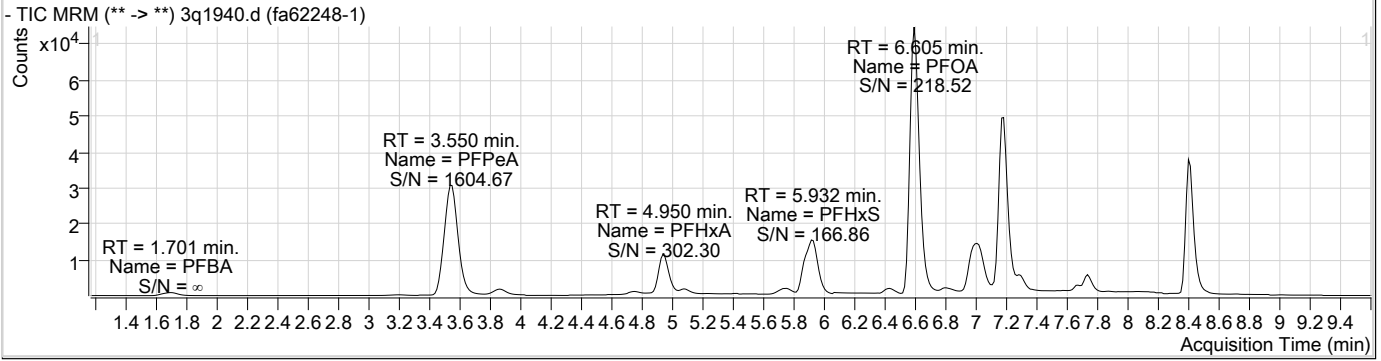
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

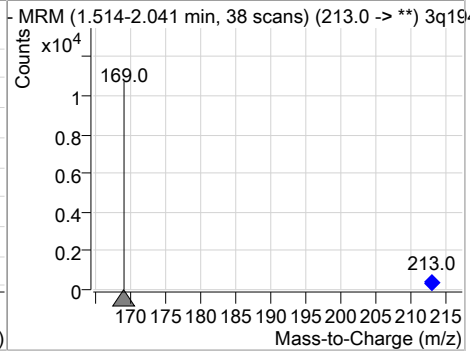
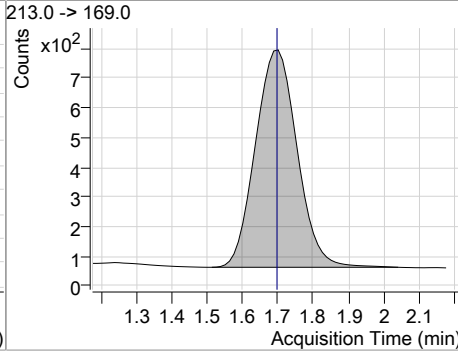
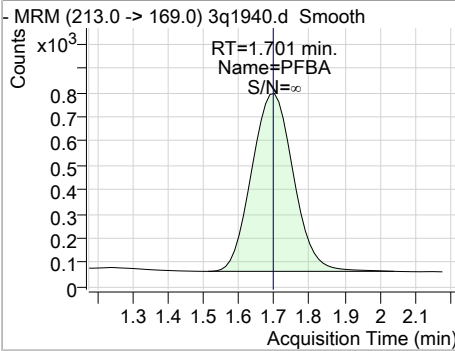
7.12
7



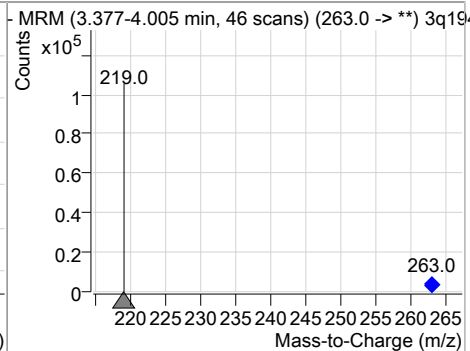
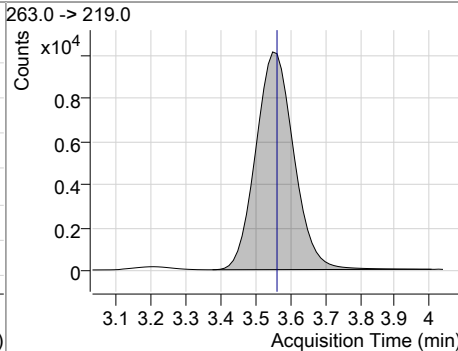
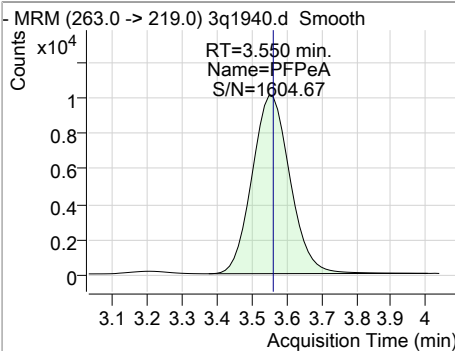
Perfluorinated Compounds by LC/MS/MS



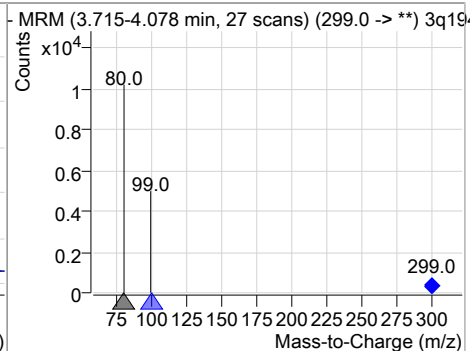
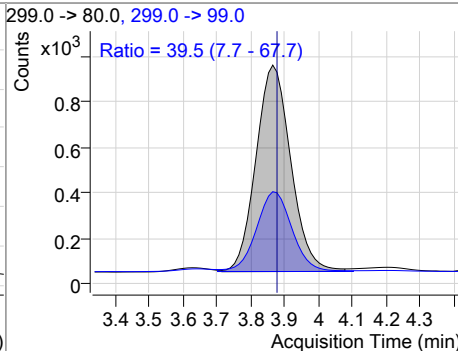
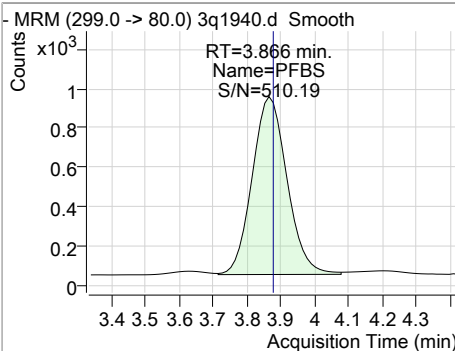
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	2.10	1.70	0.00	6015				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	9.23	3.55	-0.01	76478				

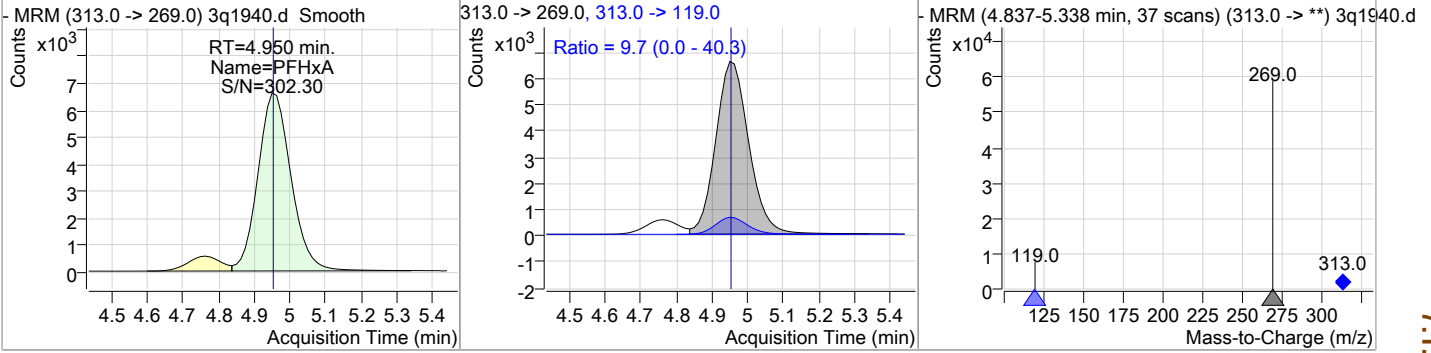


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	2.18	3.87	-0.01	6470	299.0 -> 99.0	39.5	7.7	67.7

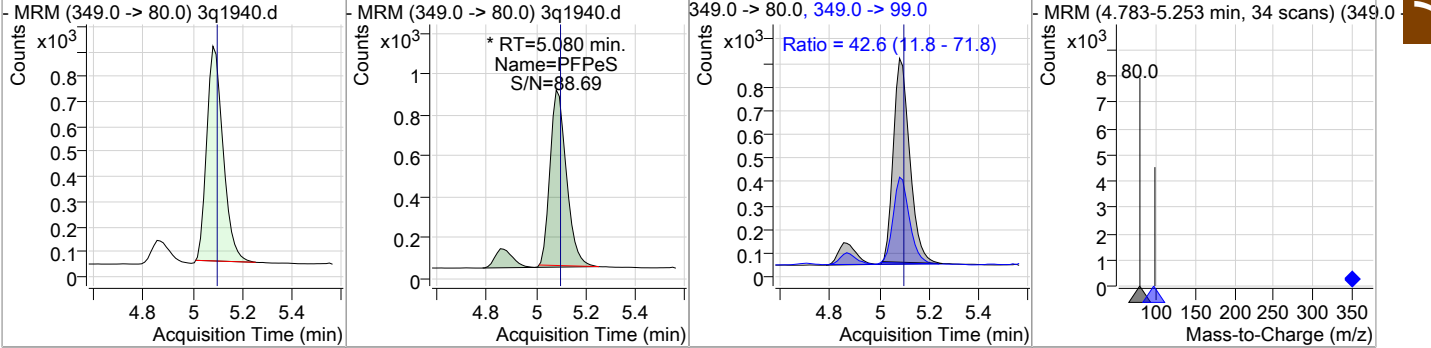


Perfluorinated Compounds by LC/MS/MS

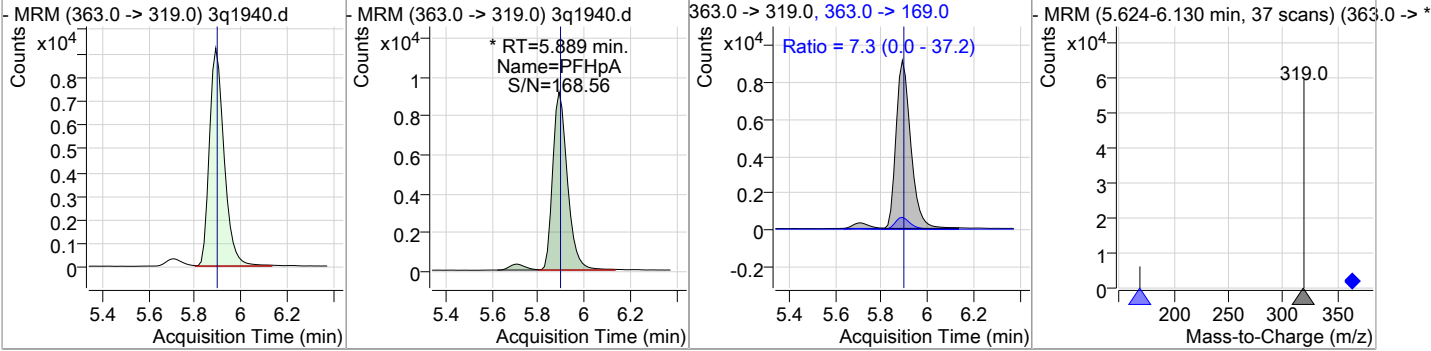
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	9.86	4.95	-0.01	42442	313.0 -> 119.0	9.7	0.0	40.3



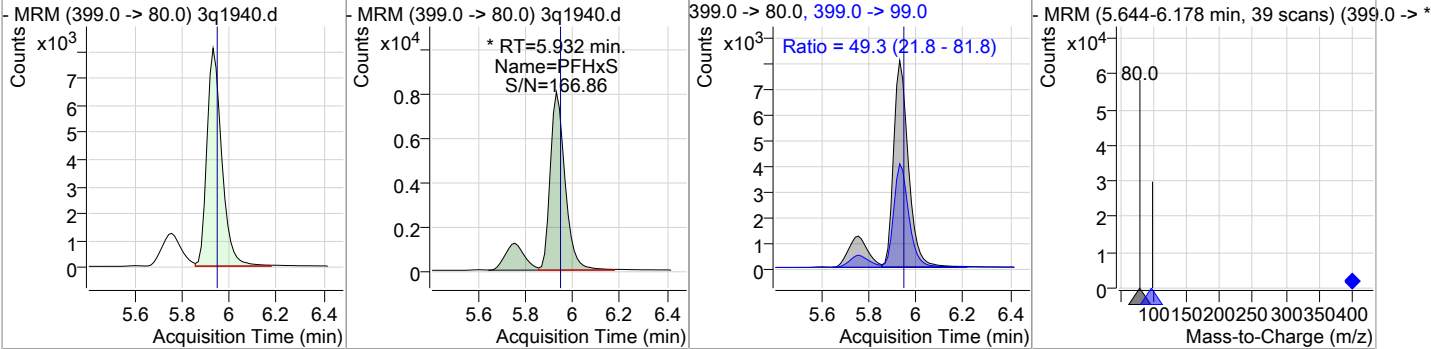
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	2.69	5.08	-0.01	4471 (m)	349.0 -> 99.0	42.6	11.8	71.8



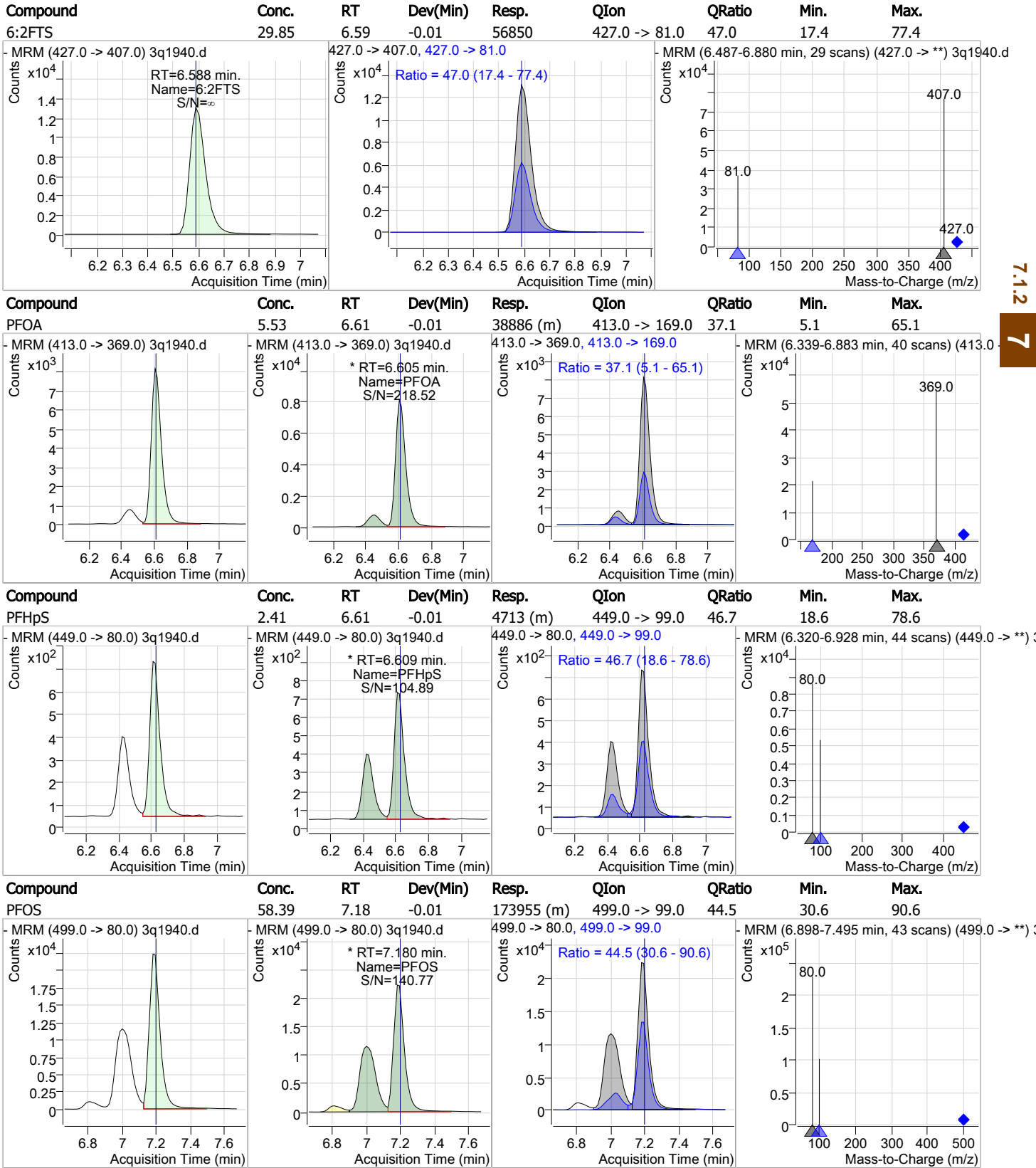
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	3.48	5.89	-0.01	41651 (m)	363.0 -> 169.0	7.3	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	19.01	5.93	-0.01	42031 (m)	399.0 -> 99.0	49.3	21.8	81.8



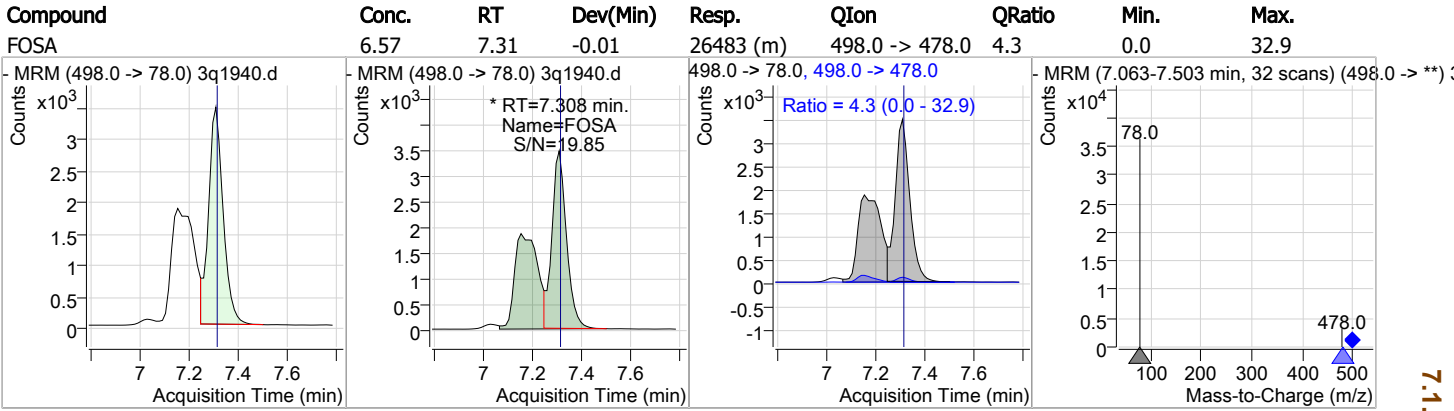
Perfluorinated Compounds by LC/MS/MS



7.12
7



Perfluorinated Compounds by LC/MS/MS



7.1.2

7

Manual Integration Approval Summary

Sample Number: FA62248-1 **Method:** EPA 537 MOD
Lab FileID: 3Q1940.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 12:14 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.08	Split peak
Perfluoroheptanoic acid	375-85-9		5.89	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanoic acid	335-67-1		6.61	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.61	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak
PFOSA	754-91-6		7.31	Split peak

7.1.2.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1942.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 12:45:31 PM
 Sample Name : fa62248-2
 Vial : P1-D5
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,115,,,1.0,2,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)	
Internal Standards						
13C2-6:2FTS	6.587	429.0 -> 409.0	47055	20.00 µg/L	-0.013	
13C2-PFDoDA	8.394	615.0 -> 570.0	154669	20.00 µg/L	-0.013	
13C2-PFOA	6.604	415.0 -> 370.0	155813	20.00 µg/L	-0.013	
13C3-PFPeA	3.546	266.0 -> 222.0	115632	20.00 µg/L	-0.013	
13C4-PFOS	7.179	503.0 -> 80.0	43740	20.00 µg/L	-0.013	
d3-MeFOSAA	7.741	573.0 -> 419.0	19372	20.00 µg/L	-0.013	
System Monitoring Compounds						
13C2-PFDA	7.670	515.0 -> 470.0	101962	12.20 µg/L	-0.014	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 61.0%		
13C2-PFHxA	4.949	315.0 -> 270.0	81630	9.55 µg/L	-0.013	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 47.7%		
d5-EtFOSAA	7.878	589.0 -> 419.0	10813	9.66 µg/L	-0.013	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 48.3%		
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%		
Target Compounds						
4:2FTS	4.846	327.0 -> 307.0	960	0.33 µg/L		QValue 97
6:2FTS	6.588	427.0 -> 407.0	216526	87.84 µg/L		98
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	-	584.0 -> 419.0	-	N.D.		
FOSA	7.308	498.0 -> 78.0	128540	28.18 µg/L	m	97
MeFOSAA	-	570.0 -> 419.0	-	N.D.		
PFBA	1.689	213.0 -> 169.0	21158	7.53 µg/L		100
PFBS	3.866	299.0 -> 80.0	21433	8.11 µg/L		99
PFDA	-	513.0 -> 469.0	-	N.D.		
PFDoDA	-	613.0 -> 569.0	-	N.D.		
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	5.889	363.0 -> 319.0	134832	11.51 µg/L	m	100
PFHpS	6.609	449.0 -> 80.0	15622	8.97 µg/L	m	98
PFHxA	4.950	313.0 -> 269.0	127126	30.16 µg/L		98
PFHxS	5.932	399.0 -> 80.0	134158	68.05 µg/L	m	97
PFNA	7.196	463.0 -> 419.0	3906	0.53 µg/L	m	100
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.605	413.0 -> 369.0	139127	20.19 µg/L	m	98
PFOS	7.180	499.0 -> 80.0	631206	237.56 µg/L	m	80
PFPeA	3.550	263.0 -> 219.0	240337	29.59 µg/L		100
PFPeS	5.080	349.0 -> 80.0	13384	8.23 µg/L	m	94
PFTeDA	-	713.0 -> 669.0	-	N.D.		
PFTrDA	-	663.0 -> 619.0	-	N.D.		
PFUnDA	-	563.0 -> 519.0	-	N.D.		
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUds	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.1.3
7



Perfluorinated Compounds by LC/MS/MS

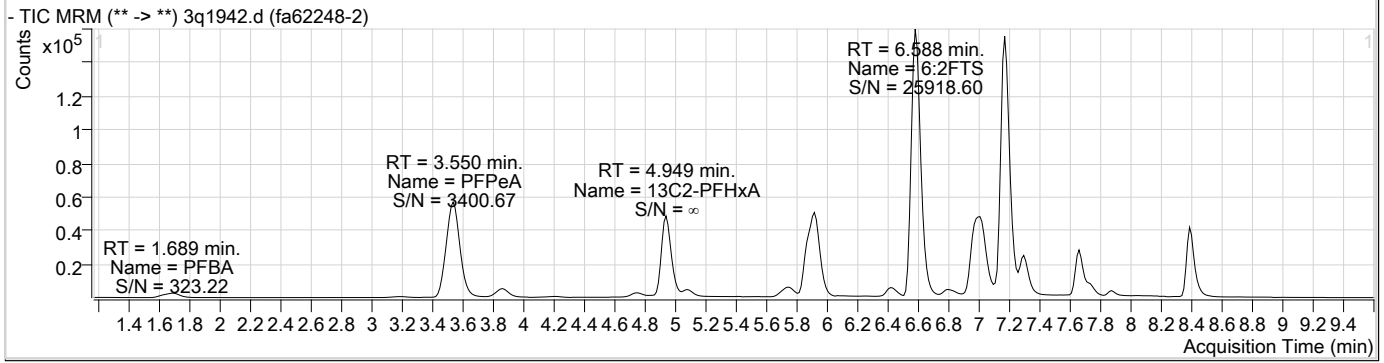
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

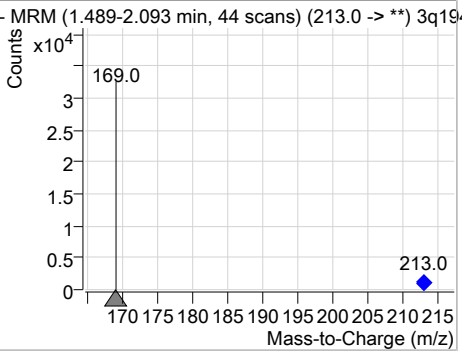
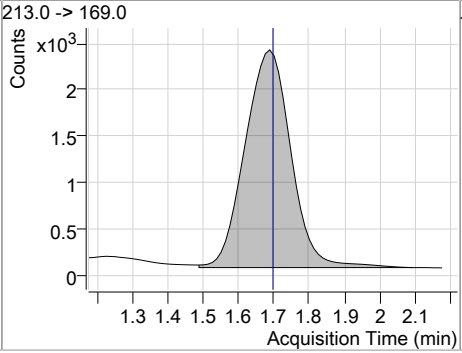
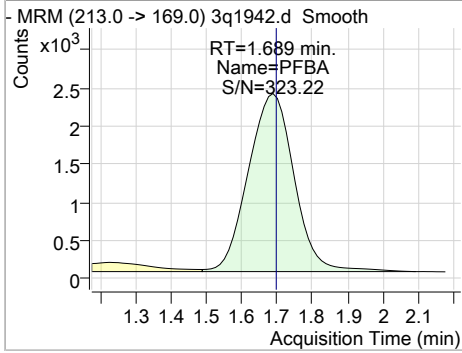
7.1.3

7

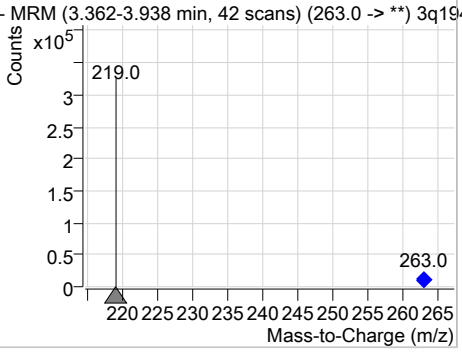
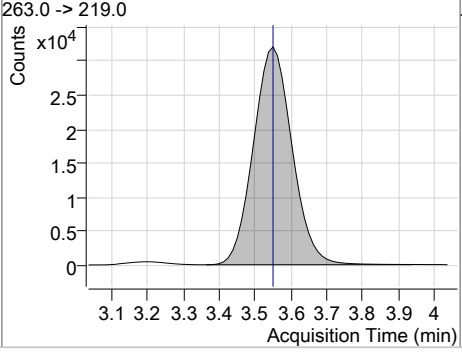
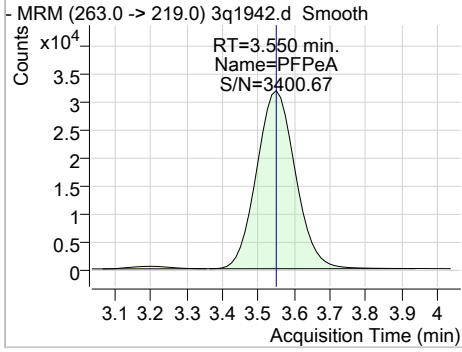
Perfluorinated Compounds by LC/MS/MS



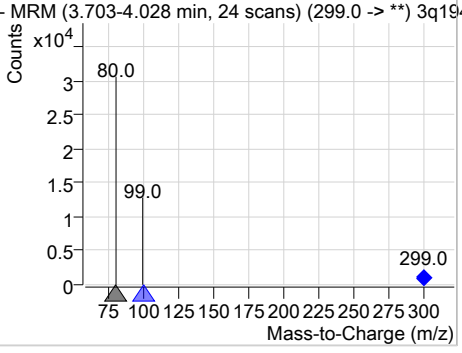
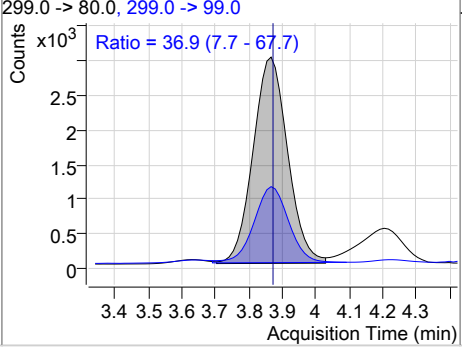
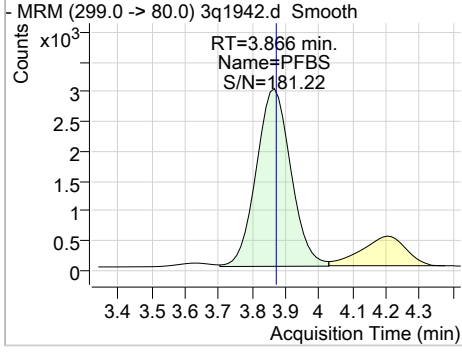
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	7.53	1.69	-0.01	21158				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	29.59	3.55	-0.01	240337				



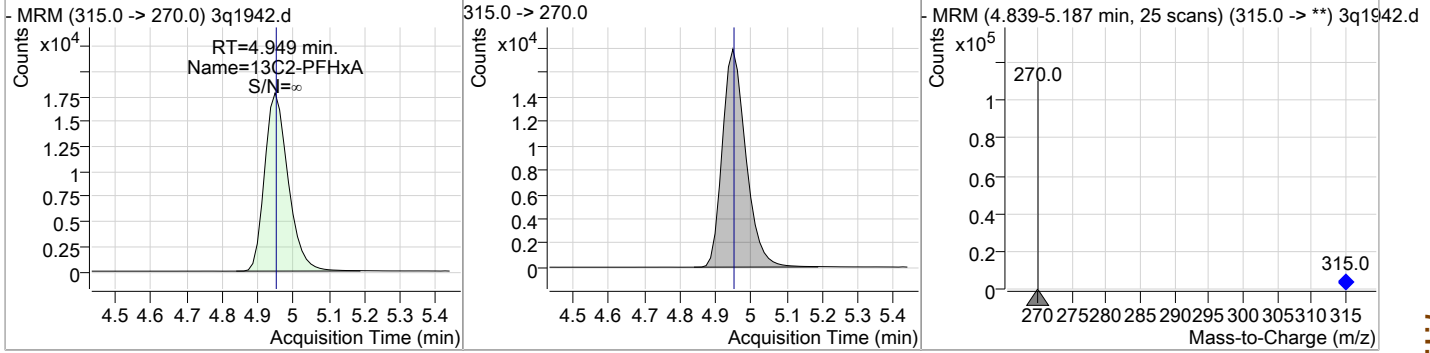
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	8.11	3.87	-0.01	21433	299.0 -> 99.0	36.9	7.7	67.7



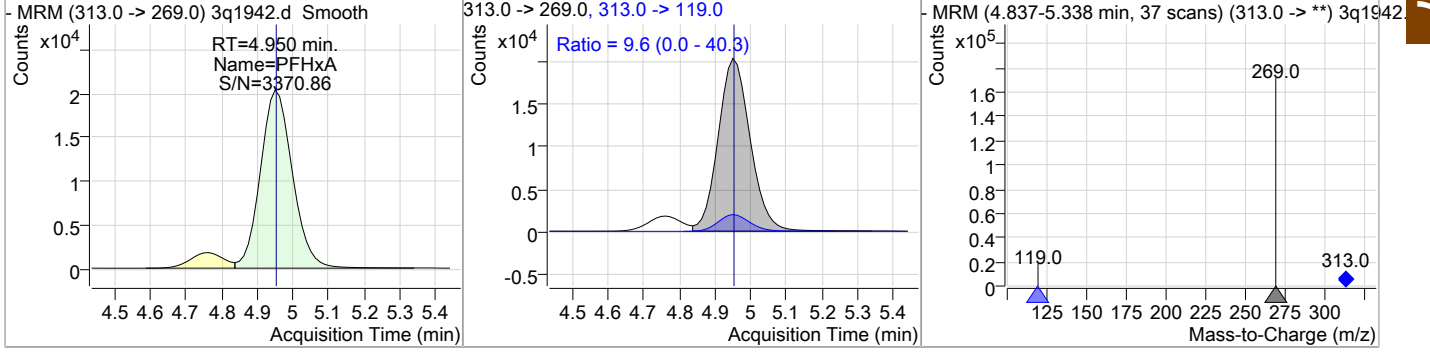
7.1.3
7

Perfluorinated Compounds by LC/MS/MS

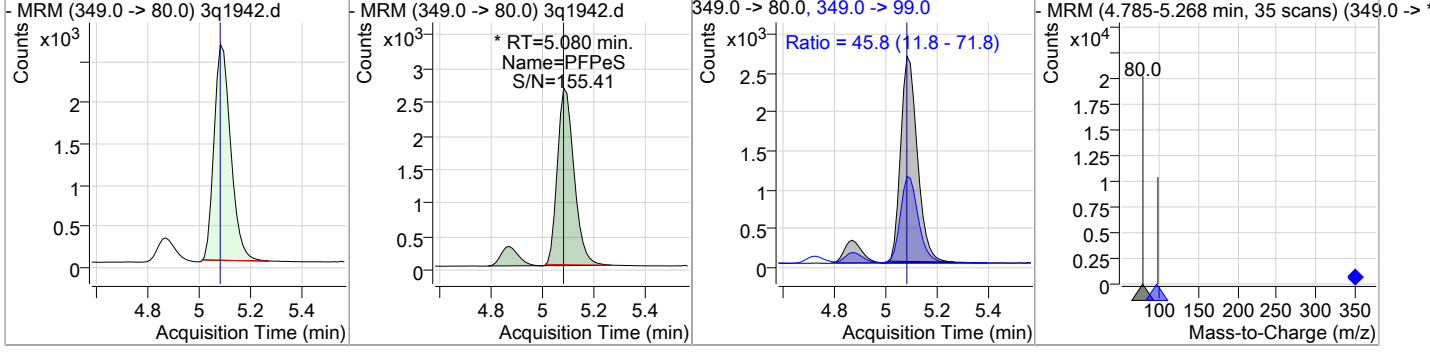
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



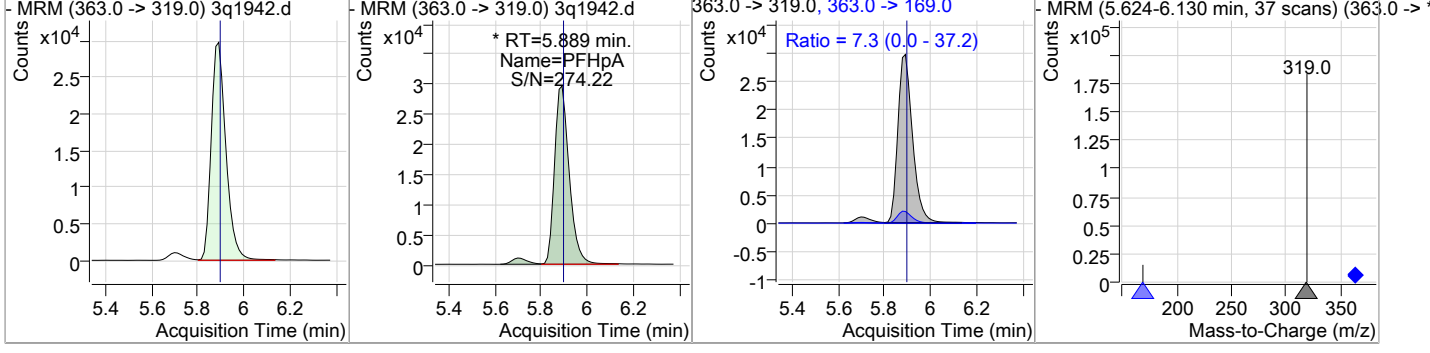
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

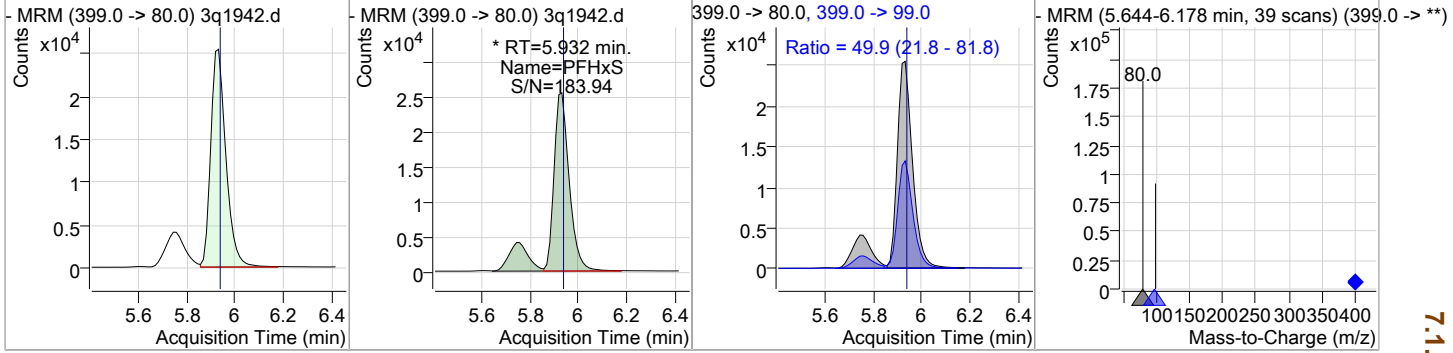


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

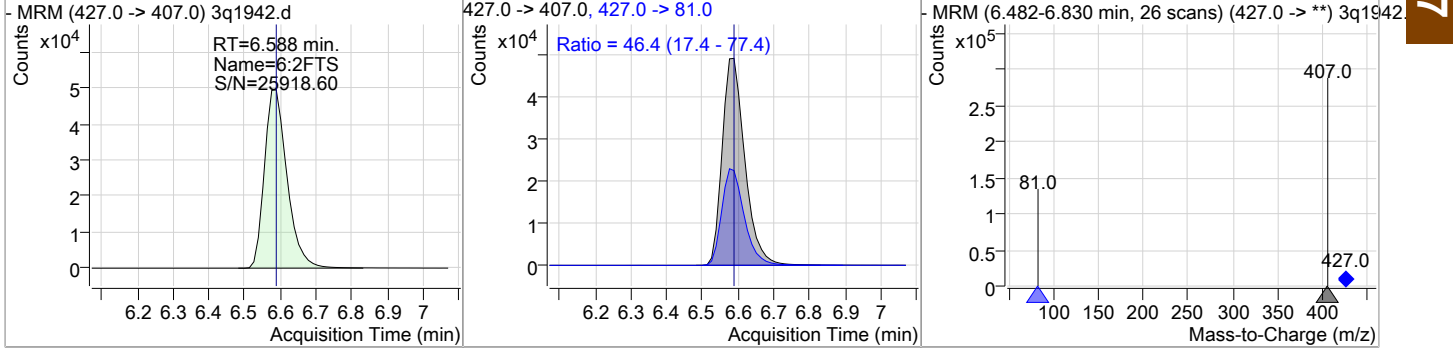


Perfluorinated Compounds by LC/MS/MS

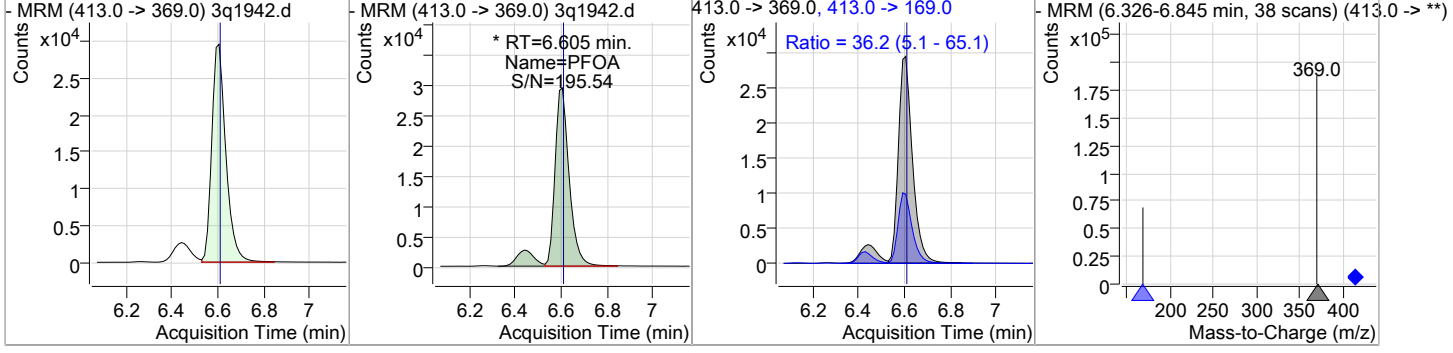
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	68.05	5.93	-0.01	134158 (m)	399.0 -> 99.0	49.9	21.8	81.8



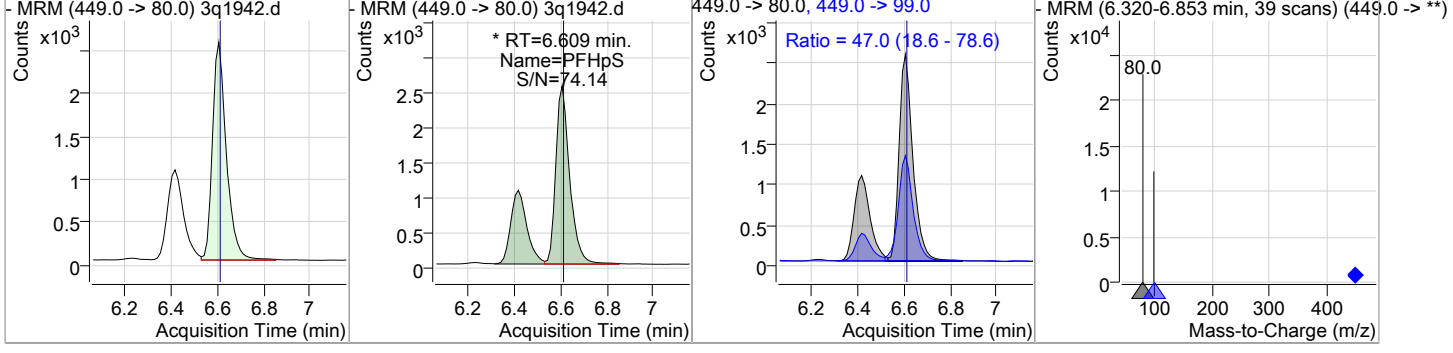
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	87.84	6.59	-0.01	216526	427.0 -> 81.0	46.4	17.4	77.4



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	20.19	6.61	-0.01	139127 (m)	413.0 -> 169.0	36.2	5.1	65.1

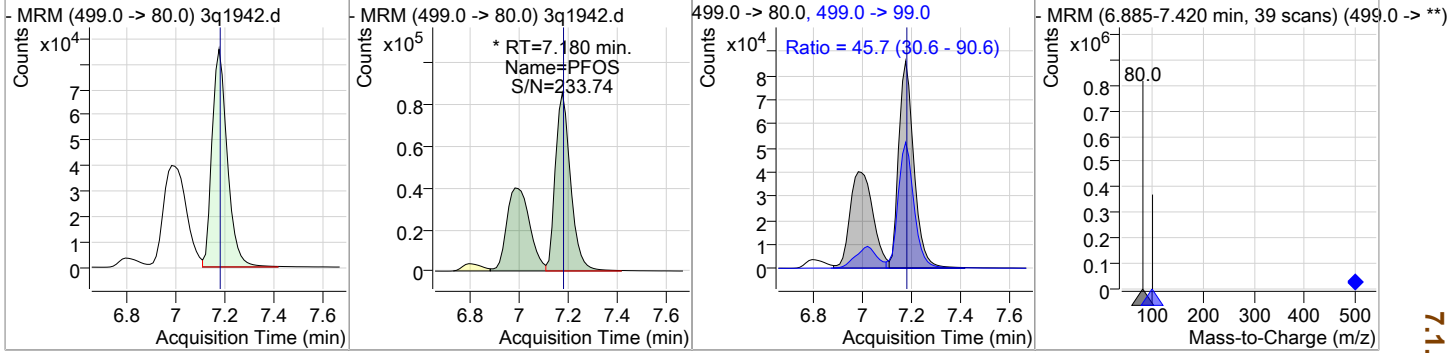


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	8.97	6.61	-0.01	15622 (m)	449.0 -> 99.0	47.0	18.6	78.6

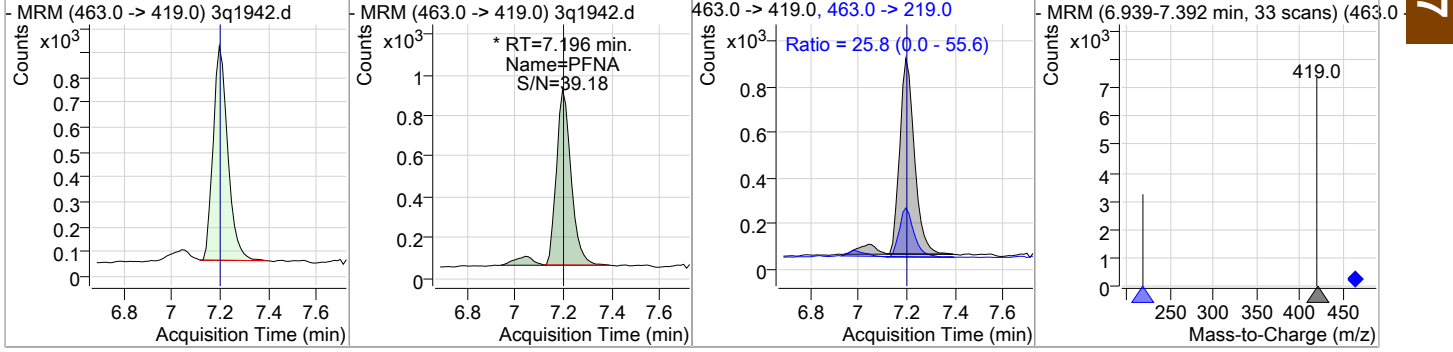


Perfluorinated Compounds by LC/MS/MS

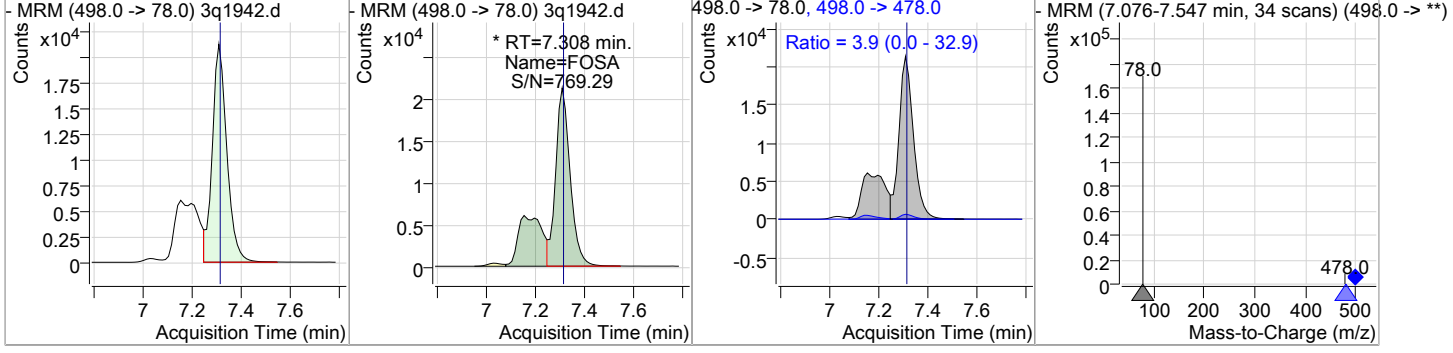
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	237.56	7.18	-0.01	631206 (m)	499.0 -> 99.0	45.7	30.6	90.6



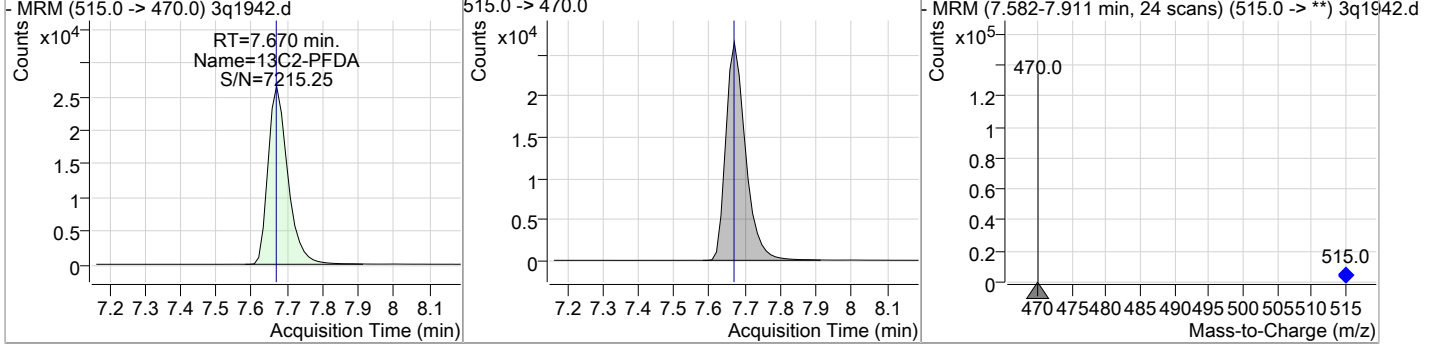
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	0.53	7.20	-0.01	3906 (m)	463.0 -> 219.0	25.8	0.0	55.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
FOSA	28.18	7.31	-0.01	128540 (m)	498.0 -> 478.0	3.9	0.0	32.9

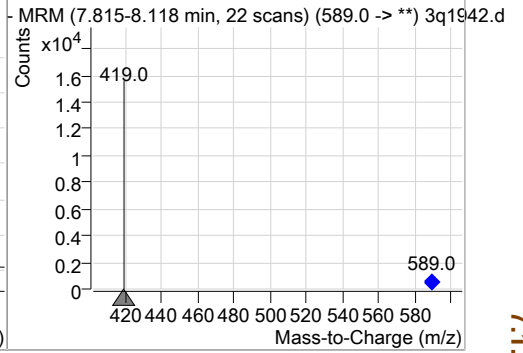
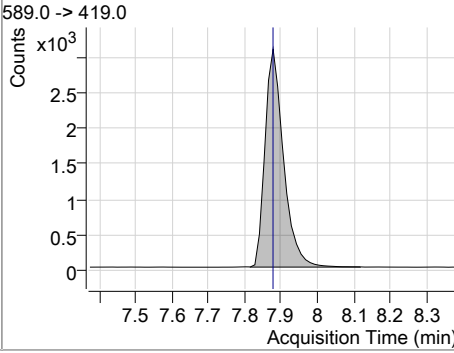
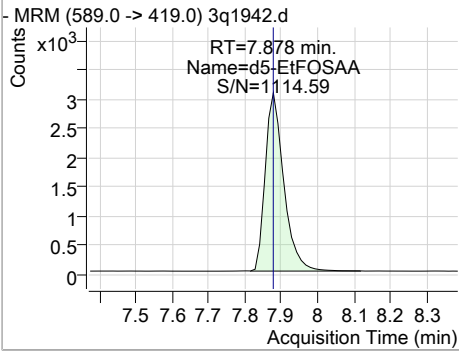


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	12.20	7.67	-0.01	101962				



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	9.66	7.88	-0.01	10813				



7.1.3
7

Manual Integration Approval Summary

Sample Number: FA62248-2 **Method:** EPA 537 MOD
Lab FileID: 3Q1942.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 12:45 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.08	Split peak
Perfluoroheptanoic acid	375-85-9		5.89	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanoic acid	335-67-1		6.61	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.61	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak
Perfluorononanoic acid	375-95-1		7.20	Split peak
PFOSA	754-91-6		7.31	Split peak

7.13.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1943.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 1:00:51 PM
 Sample Name : fa62248-2
 Vial : P1-D6
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,115,,,1.0,10,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	39342	20.00 µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	149225	20.00 µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	164219	20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	120908	20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	48617	20.00 µg/L	0.000
d3-MeFOSAA	7.741	573.0 -> 419.0	18669	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	19574	2.21 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 11.0%		
13C2-PFHxA	4.961	315.0 -> 270.0	17739	1.98 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 9.9%		
d5-EtFOSAA	7.878	589.0 -> 419.0	2111	1.96 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 9.8%		
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%		
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	6.601	427.0 -> 407.0	44383	21.54 µg/L	99
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	7.308	498.0 -> 78.0	27496	6.07 µg/L	m 96
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.701	213.0 -> 169.0	4739	1.60 µg/L	100
PFBS	3.878	299.0 -> 80.0	4808	1.64 µg/L	98
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	5.889	363.0 -> 319.0	29141	2.36 µg/L	m 100
PFHpS	6.621	449.0 -> 80.0	3546	1.83 µg/L	m 99
PFHxA	4.962	313.0 -> 269.0	28046	6.31 µg/L	100
PFHxS	5.944	399.0 -> 80.0	29594	13.51 µg/L	m 98
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	6.618	413.0 -> 369.0	29655	4.08 µg/L	m 98
PFOS	7.192	499.0 -> 80.0	142489	48.25 µg/L	m 81
PFPeA	3.562	263.0 -> 219.0	50471	5.94 µg/L	100
PFPeS	5.093	349.0 -> 80.0	3158	1.86 µg/L	m 98
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.14

7

Perfluorinated Compounds by LC/MS/MS

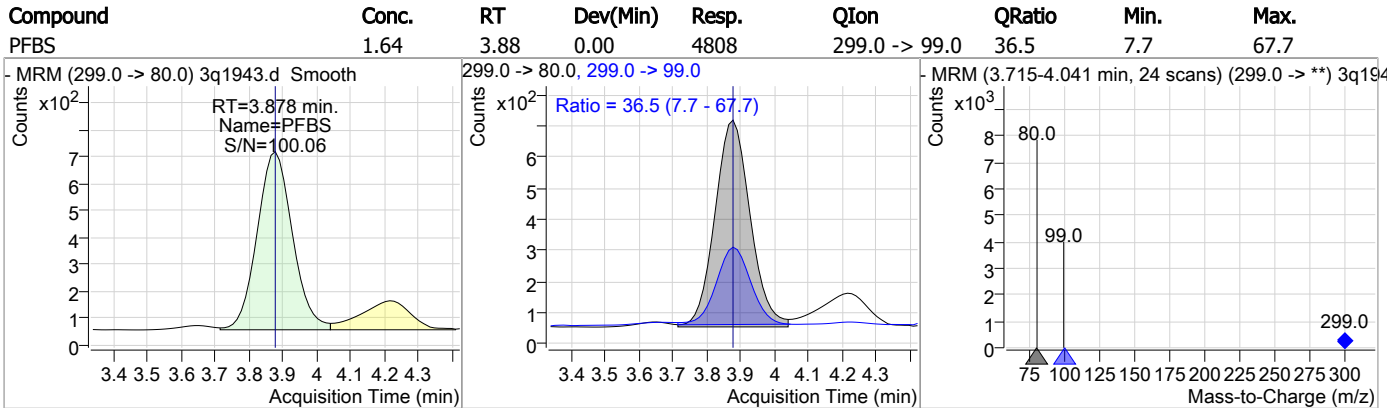
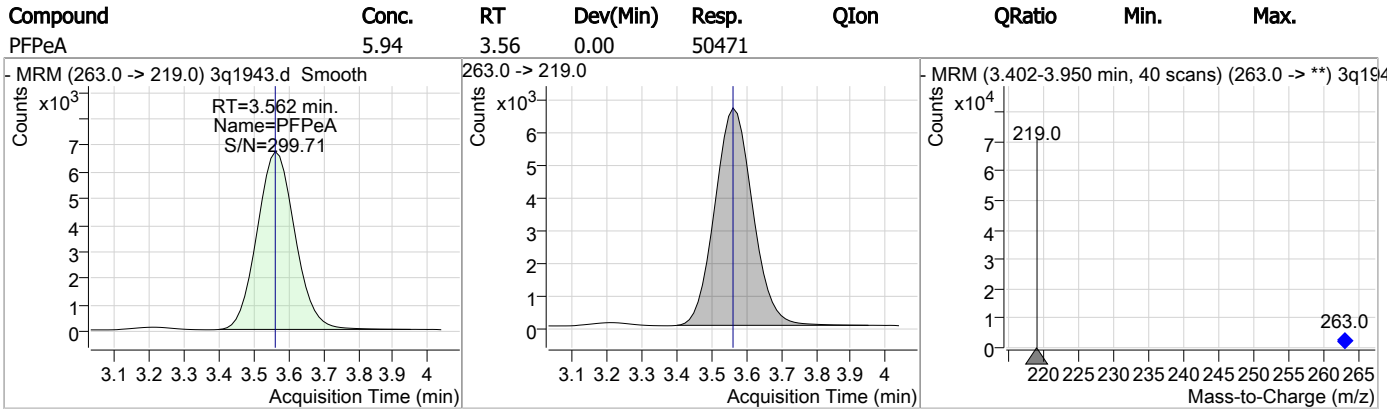
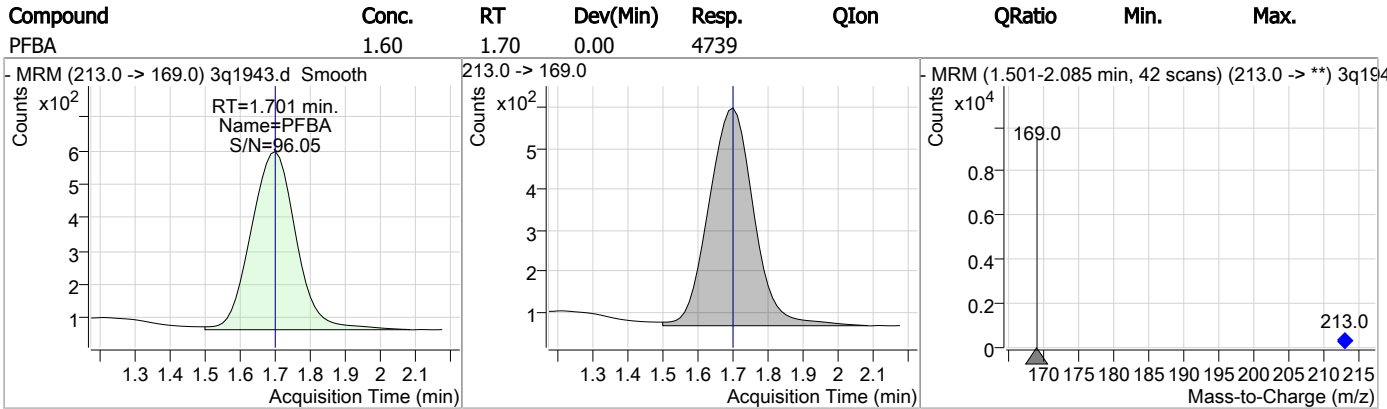
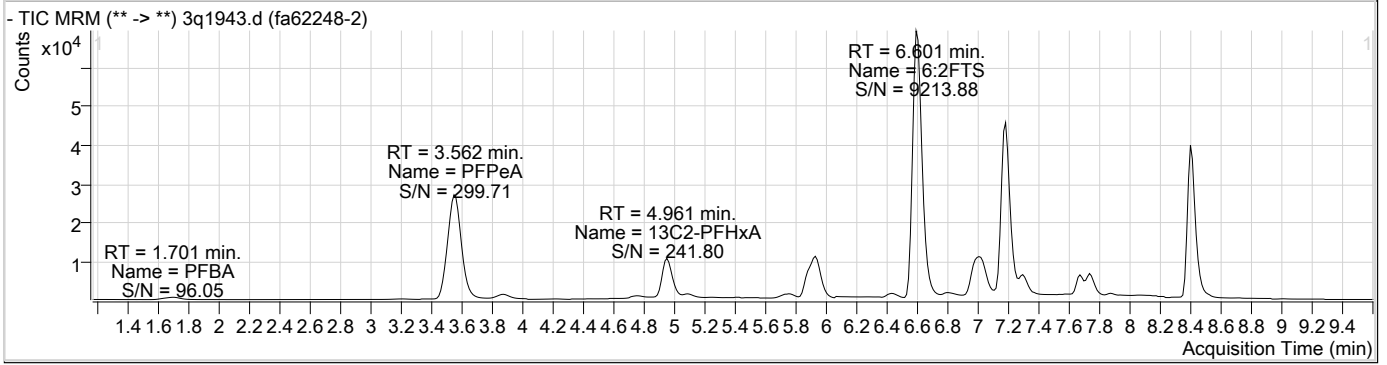
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.1.4
7



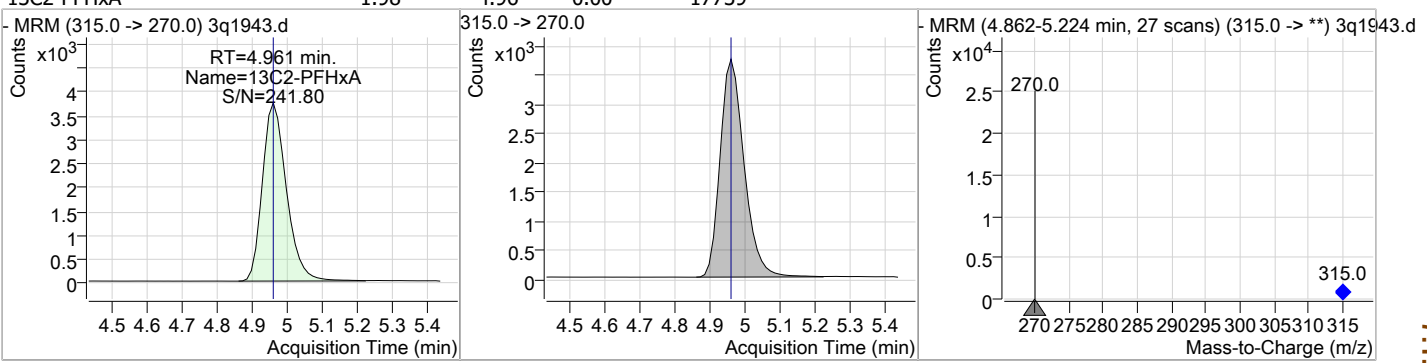
Perfluorinated Compounds by LC/MS/MS



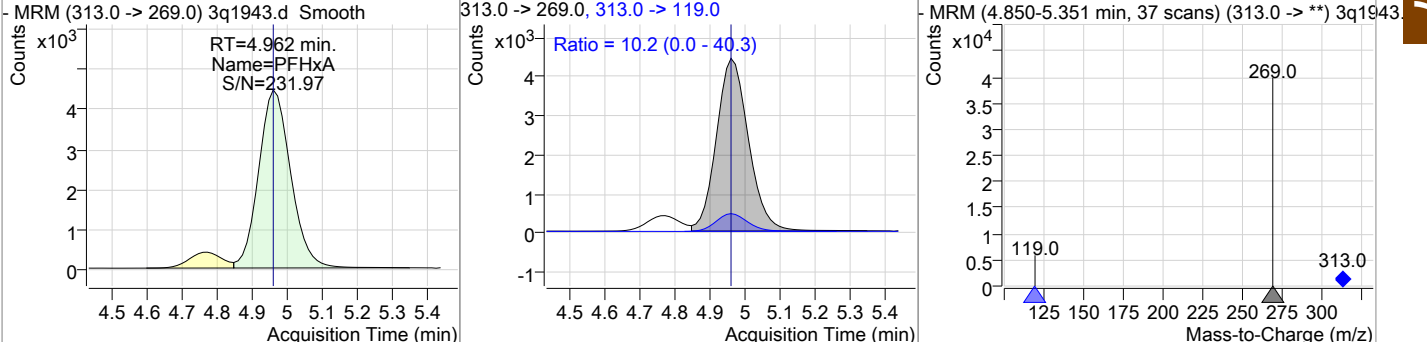
7.14
7

Perfluorinated Compounds by LC/MS/MS

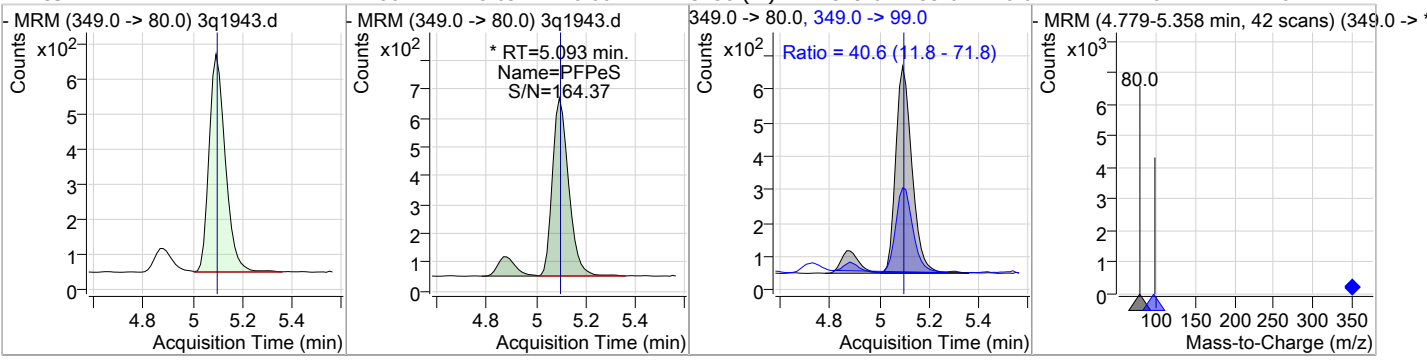
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



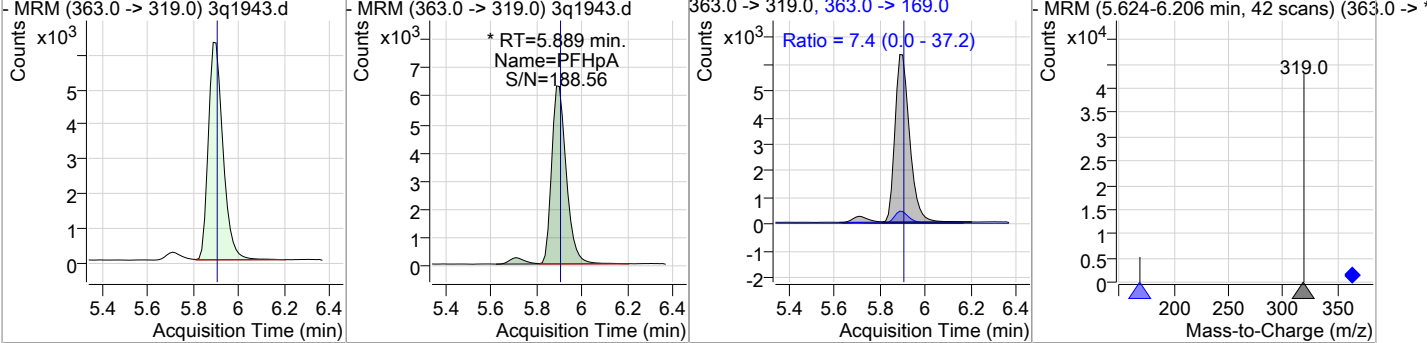
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



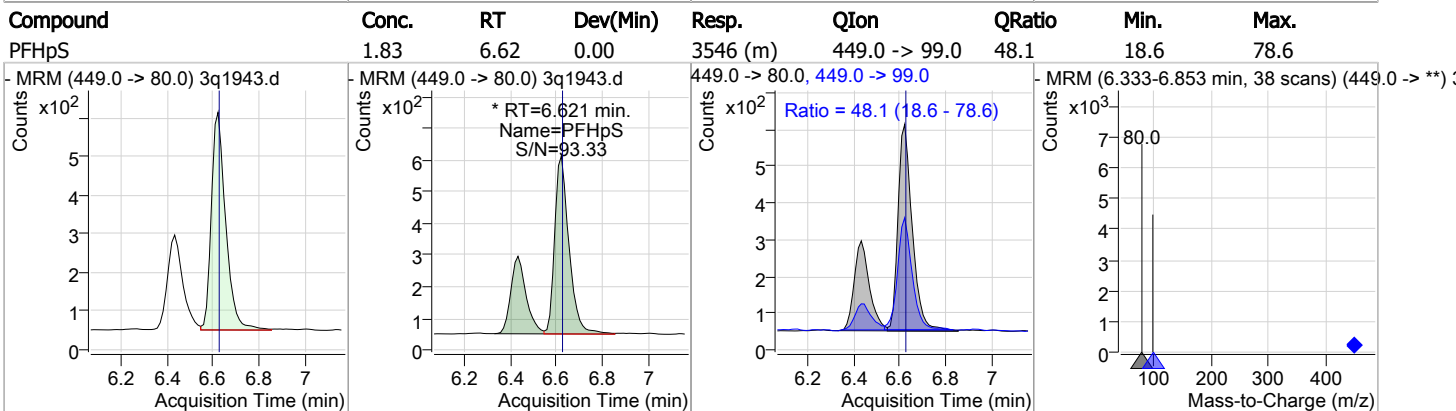
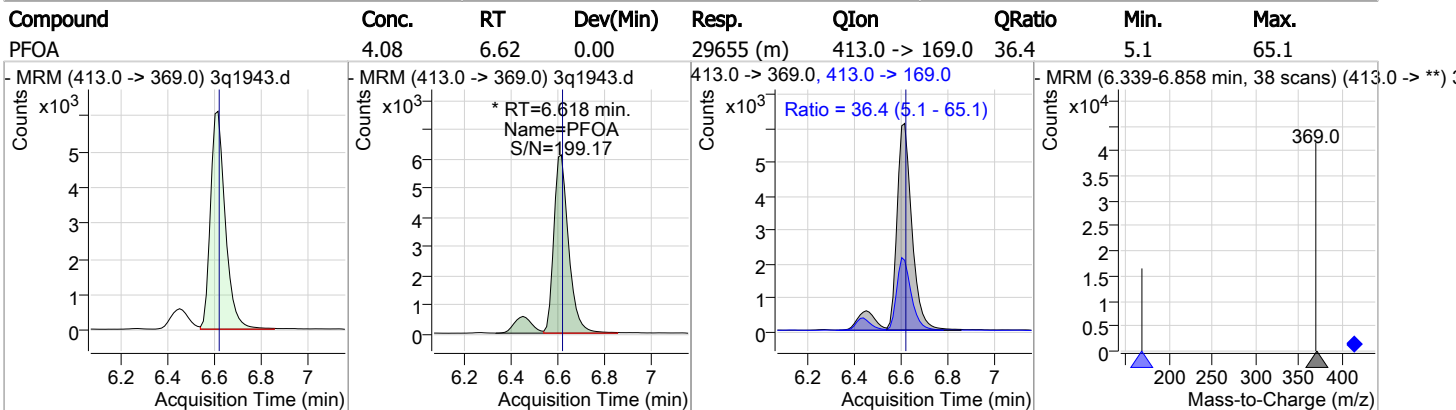
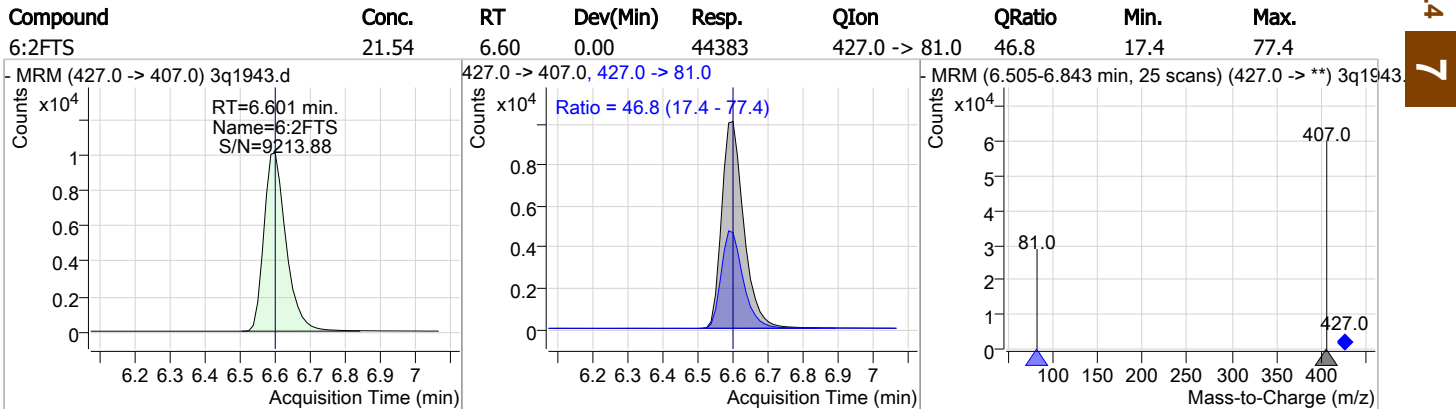
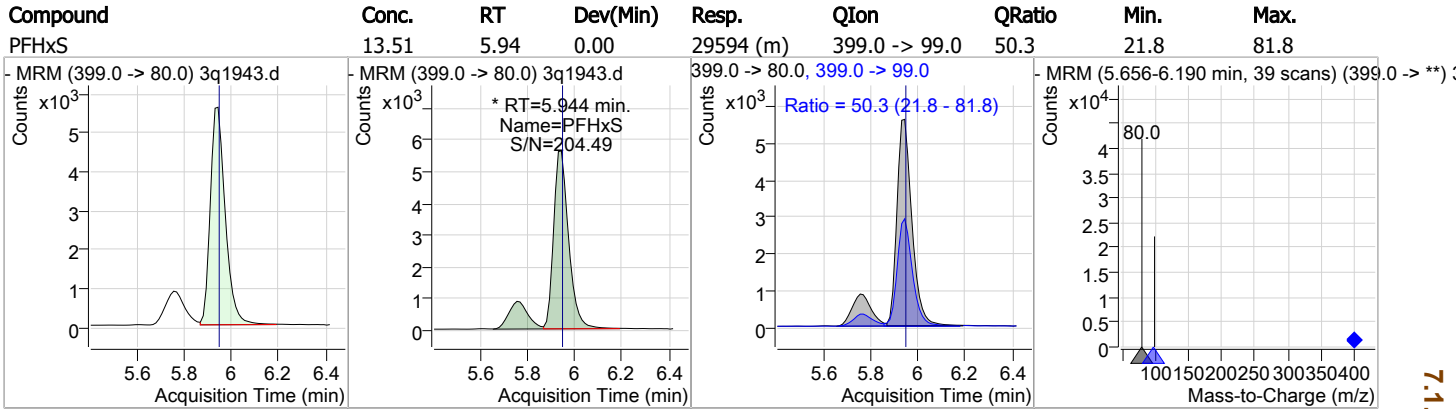
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



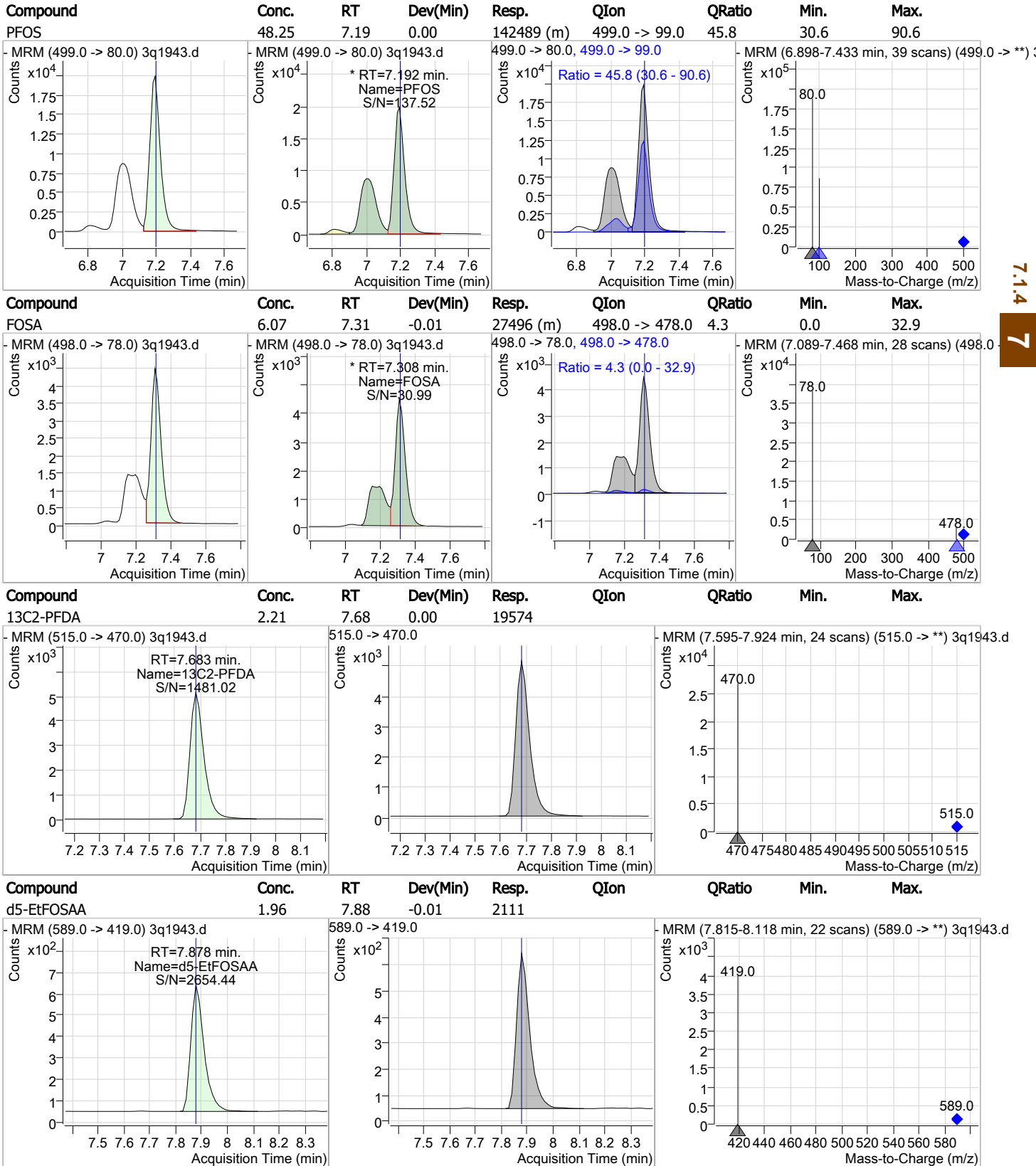
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



7.14
7

Manual Integration Approval Summary

Sample Number: FA62248-2 **Method:** EPA 537 MOD
Lab FileID: 3Q1943.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 13:00 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.09	Split peak
Perfluoroheptanoic acid	375-85-9		5.89	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanoic acid	335-67-1		6.62	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
PFOSA	754-91-6		7.31	Split peak

7.1.4.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1918.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 4:39:12 PM
 Sample Name : FA62248-3
 Vial : P1-B9
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74166,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.612	429.0 -> 409.0	39334	20.00 µg/L	0.013
13C2-PFDoDA	8.280	615.0 -> 570.0	219347	20.00 µg/L	-0.126
13C2-PFOA	6.629	415.0 -> 370.0	191660	20.00 µg/L	0.013
13C3-PFPeA	3.572	266.0 -> 222.0	135706	20.00 µg/L	0.013
13C4-PFOS	7.204	503.0 -> 80.0	56468	20.00 µg/L	0.013
d3-MeFOSAA	7.741	573.0 -> 419.0	22288	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.670	515.0 -> 470.0	238059	23.36 µg/L	-0.014
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 116.8%	
13C2-PFHxA	4.974	315.0 -> 270.0	209275	19.79 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 98.9%	
d5-EtFOSAA	7.878	589.0 -> 419.0	25546	19.84 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 99.2%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.15
7

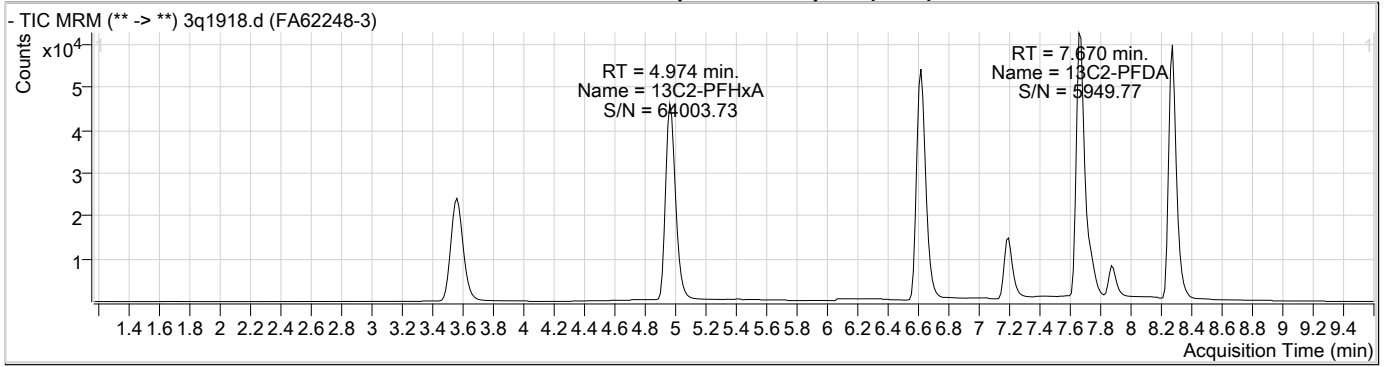


Perfluorinated Compounds by LC/MS/MS

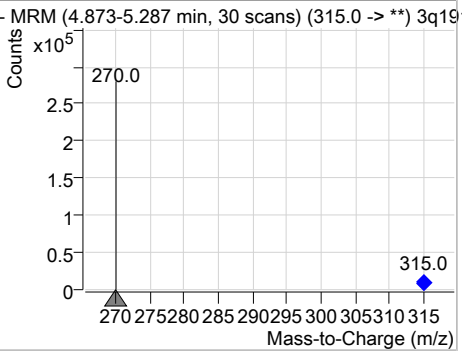
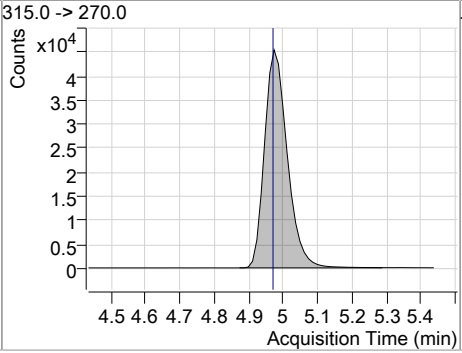
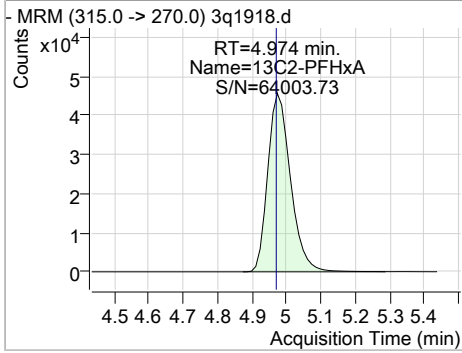
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

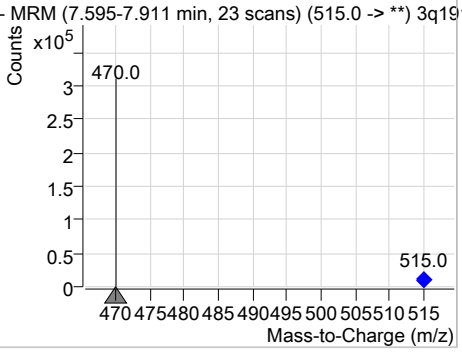
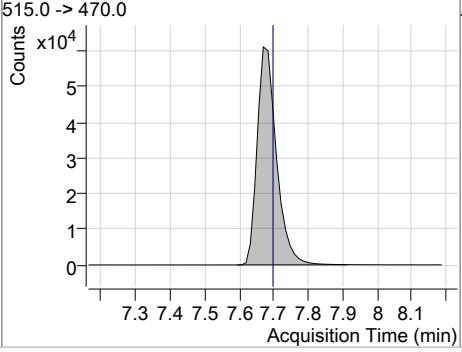
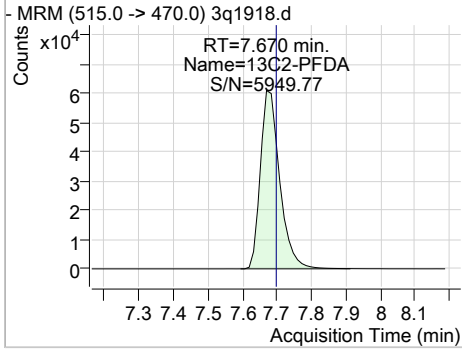
Perfluorinated Compounds by LC/MS/MS



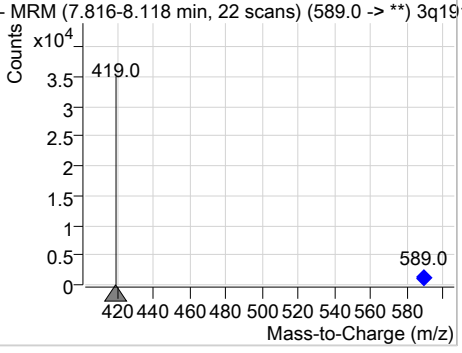
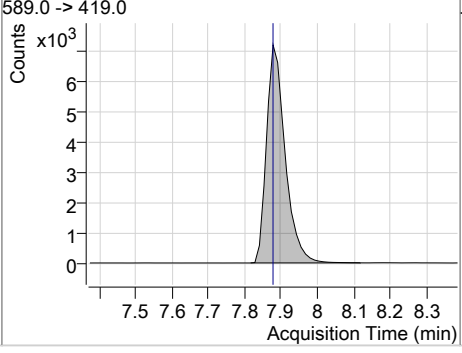
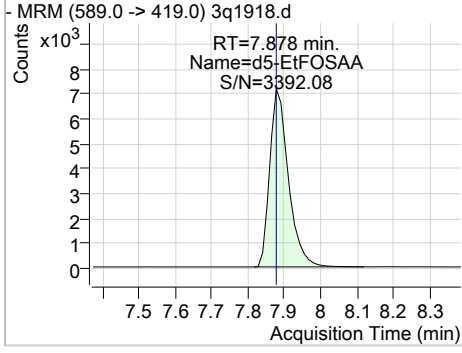
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.79	4.97	0.01	209275				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	23.36	7.67	-0.01	238059				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	19.84	7.88	-0.01	25546				



7.1.5
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1944.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 1:16:11 PM
 Sample Name : fa62248-4
 Vial : P1-D7
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	34174	20.00 µg/L	0.000
13C2-PFDoDA	8.318	615.0 -> 570.0	197299	20.00 µg/L	-0.089
13C2-PFOA	6.616	415.0 -> 370.0	167752	20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	116884	20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	50463	20.00 µg/L	0.000
d3-MeFOSAA	7.741	573.0 -> 419.0	18491	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.670	515.0 -> 470.0	203011	22.75 µg/L	-0.014
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 113.7%	
13C2-PFHxA	4.961	315.0 -> 270.0	182576	19.73 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 98.6%	
d5-EtFOSAA	7.865	589.0 -> 419.0	21526	20.15 µg/L	-0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.8%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
					QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.	
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	7.308	498.0 -> 78.0	1903	0.42 µg/L m	97
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.1.6
7



Perfluorinated Compounds by LC/MS/MS

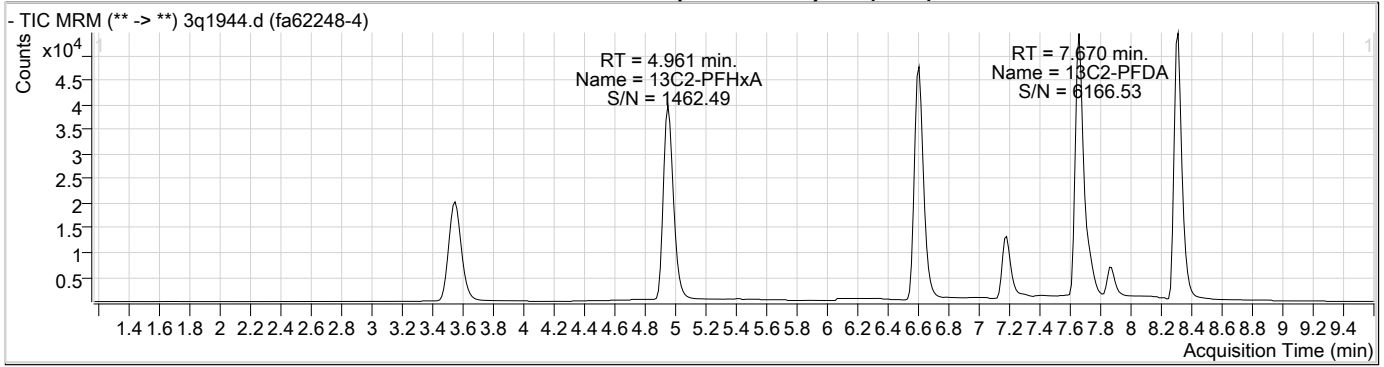
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

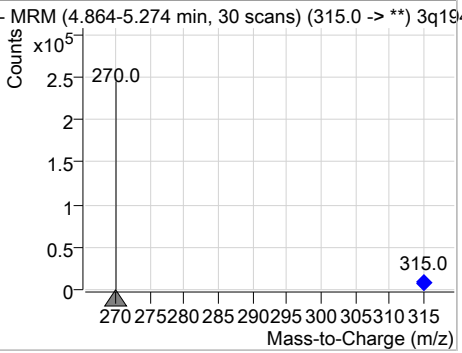
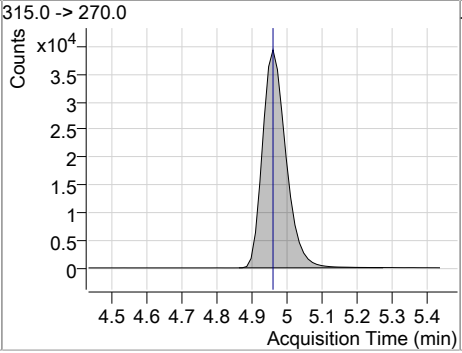
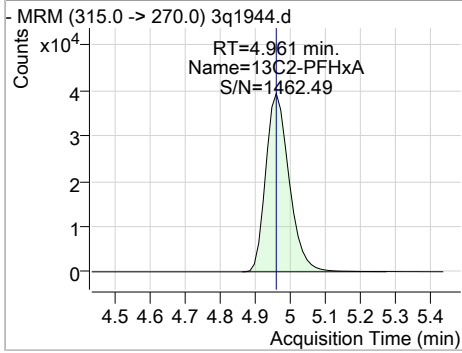
7.1.6

7

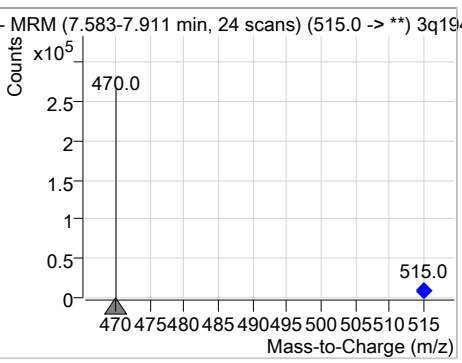
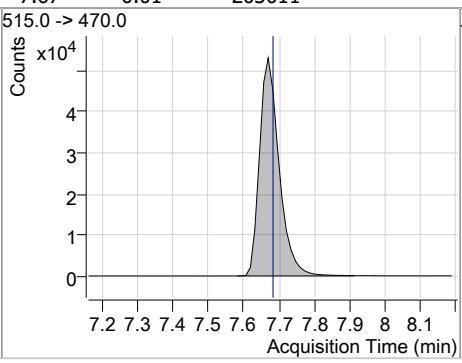
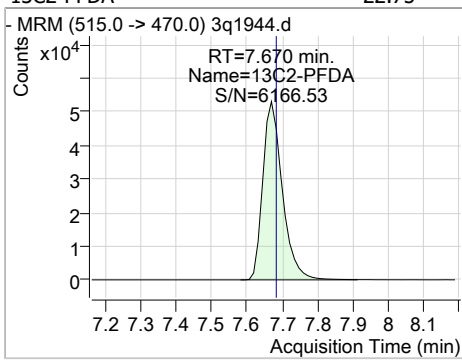
Perfluorinated Compounds by LC/MS/MS



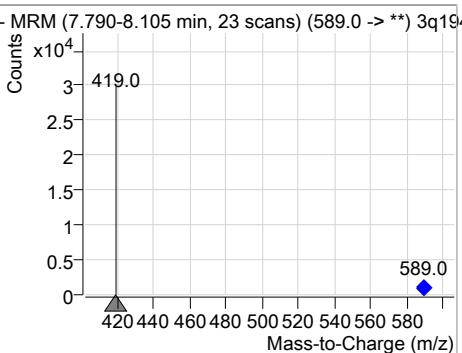
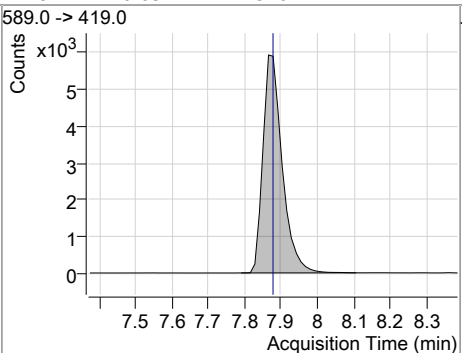
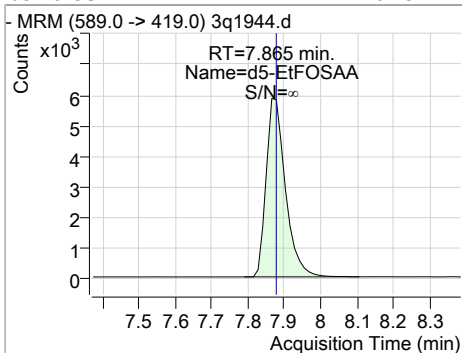
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.73	4.96	0.00	182576				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	22.75	7.67	-0.01	203011				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	20.15	7.87	-0.03	21526				



Manual Integration Approval Summary

Sample Number: FA62248-4 **Method:** EPA 537 MOD
Lab FileID: 3Q1944.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 13:16 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
PFOA	754-91-6		7.31	Split peak

7.1.6.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1923.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 5:55:52 PM
 Sample Name : FA62248-6
 Vial : P1-C3
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74166,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.624	429.0 -> 409.0	52398	20.00 µg/L	0.025
13C2-PFDoDA	8.419	615.0 -> 570.0	213865	20.00 µg/L	0.013
13C2-PFOA	6.641	415.0 -> 370.0	229654	20.00 µg/L	0.025
13C3-PFPeA	3.584	266.0 -> 222.0	145480	20.00 µg/L	0.025
13C4-PFOS	7.217	503.0 -> 80.0	59755	20.00 µg/L	0.026
d3-MeFOSAA	7.754	573.0 -> 419.0	26958	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.709	515.0 -> 470.0	230132	18.78 µg/L	0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 93.9%	
13C2-PFHxA	4.986	315.0 -> 270.0	236925	18.71 µg/L	0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 93.5%	
d5-EtFOSAA	7.890	589.0 -> 419.0	25928	16.65 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 83.2%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.17
7



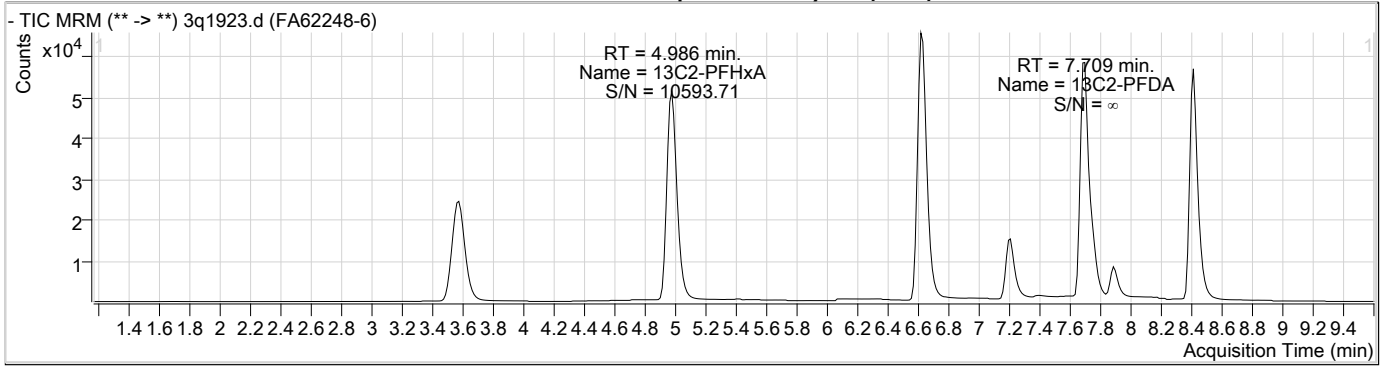
Perfluorinated Compounds by LC/MS/MS

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

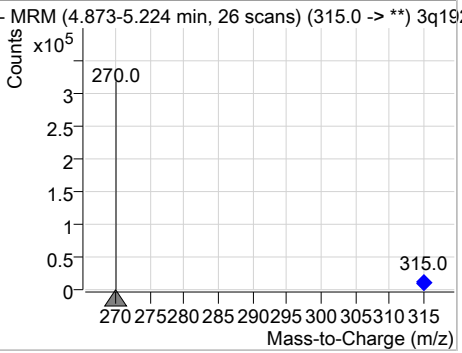
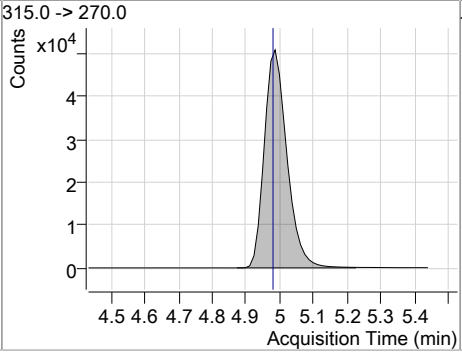
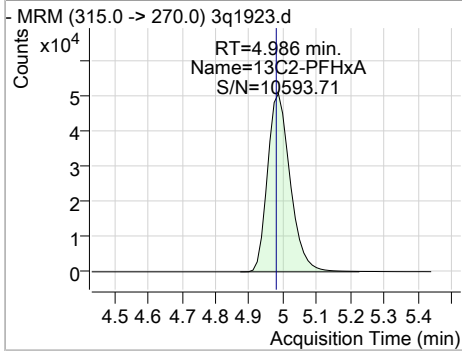
= Qualifier out of range, m = manually integrated, + = Area summed

7.1.7
7

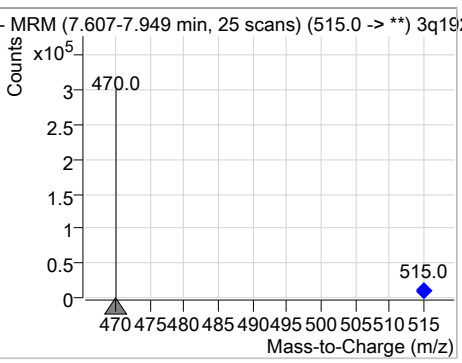
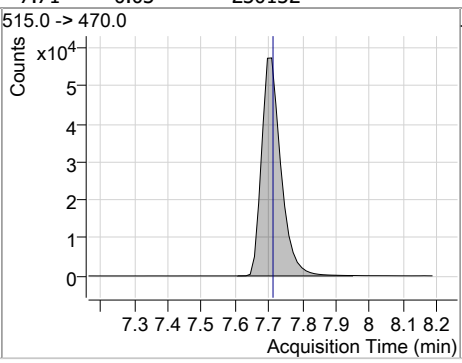
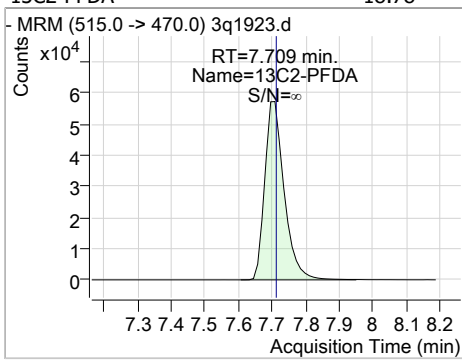
Perfluorinated Compounds by LC/MS/MS



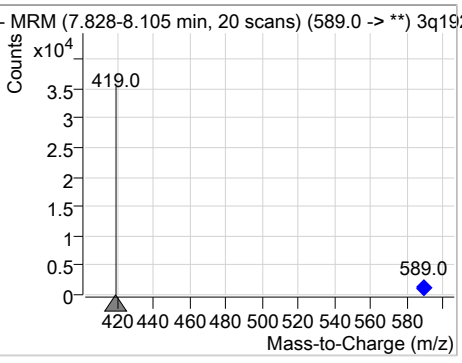
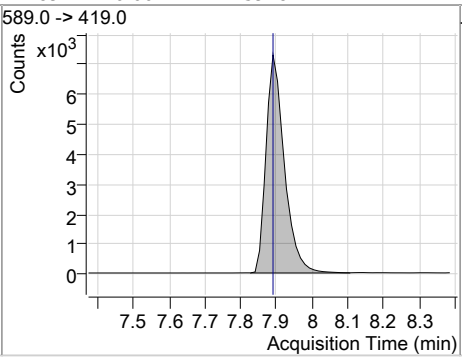
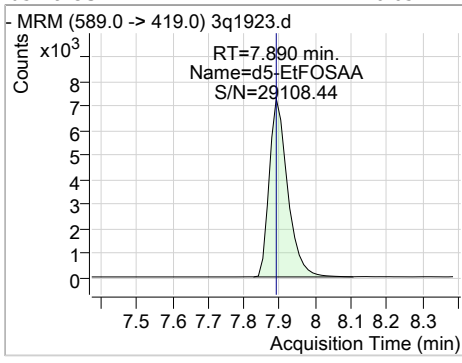
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	18.71	4.99	0.03	236925				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	18.78	7.71	0.03	230132				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	16.65	7.89	0.00	25928				



Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/18/19 16:06

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1945.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 1:31:32 PM
 Sample Name : fa62248-7
 Vial : P1-D8
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,100,,,1.0,5,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)	QValue
Internal Standards						
13C2-6:2FTS	6.587	429.0 -> 409.0	51832	20.00 µg/L	-0.013	
13C2-PFDoDA	8.407	615.0 -> 570.0	157572	20.00 µg/L	0.000	
13C2-PFOA	6.604	415.0 -> 370.0	165193	20.00 µg/L	-0.013	
13C3-PFPeA	3.559	266.0 -> 222.0	120283	20.00 µg/L	0.000	
13C4-PFOS	7.191	503.0 -> 80.0	43661	20.00 µg/L	0.000	
d3-MeFOSAA	7.741	573.0 -> 419.0	20649	20.00 µg/L	-0.013	
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	39660	4.45 µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 22.2%		
13C2-PFHxA	4.961	315.0 -> 270.0	34538	3.82 µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 19.1%		
d5-EtFOSAA	7.878	589.0 -> 419.0	4211	3.53 µg/L	-0.013	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 17.7%		
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%		
Target Compounds						
4:2FTS	4.858	327.0 -> 307.0	1489	0.46 µg/L		95
6:2FTS	6.588	427.0 -> 407.0	303204	111.67 µg/L		99
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	-	584.0 -> 419.0	-	N.D.		
FOSA	7.308	498.0 -> 78.0	111614	22.79 µg/L	m	96
MeFOSAA	-	570.0 -> 419.0	-	N.D.		
PFBA	1.689	213.0 -> 169.0	29092	9.77 µg/L		100
PFBS	3.866	299.0 -> 80.0	31207	11.83 µg/L		98
PFDA	-	513.0 -> 469.0	-	N.D.		
PFDoDA	-	613.0 -> 569.0	-	N.D.		
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	5.889	363.0 -> 319.0	203940	16.43 µg/L	m	100
PFHpS	6.621	449.0 -> 80.0	22165	12.76 µg/L	m	97
PFHxA	4.962	313.0 -> 269.0	206473	46.21 µg/L		98
PFHxS	5.932	399.0 -> 80.0	202848	103.08 µg/L	m	97
PFNA	7.208	463.0 -> 419.0	4477	0.57 µg/L	m	95
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.605	413.0 -> 369.0	197879	27.09 µg/L	m	98
PFOS	7.180	499.0 -> 80.0	794934	299.71 µg/L	m	78
PFPeA	3.550	263.0 -> 219.0	374842	44.37 µg/L		100
PFPeS	5.093	349.0 -> 80.0	21685	12.82 µg/L	m	96
PFTeDA	-	713.0 -> 669.0	-	N.D.		
PFTrDA	-	663.0 -> 619.0	-	N.D.		
PFUnDA	-	563.0 -> 519.0	-	N.D.		
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.1.8
7

Perfluorinated Compounds by LC/MS/MS

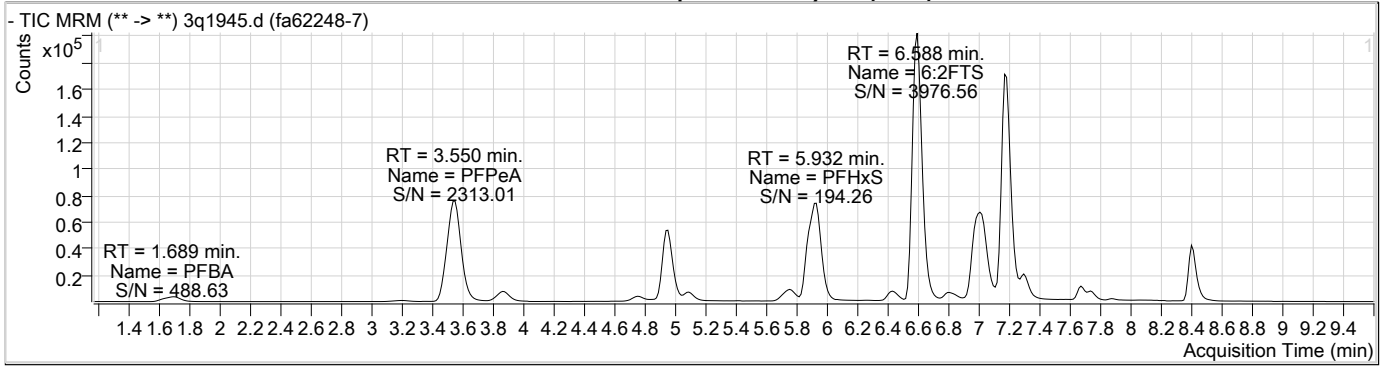
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

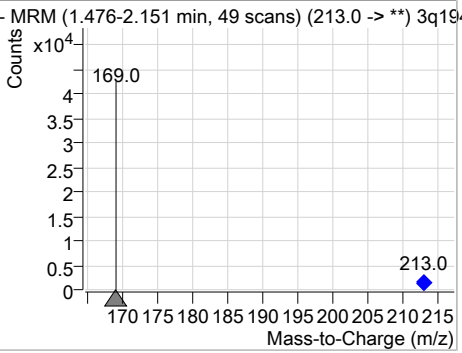
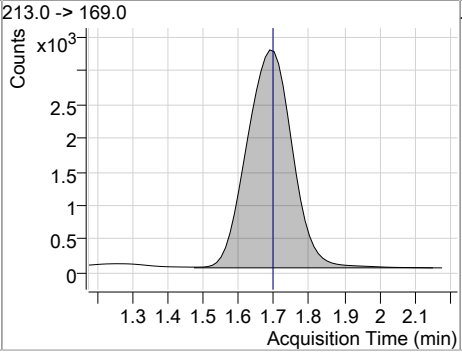
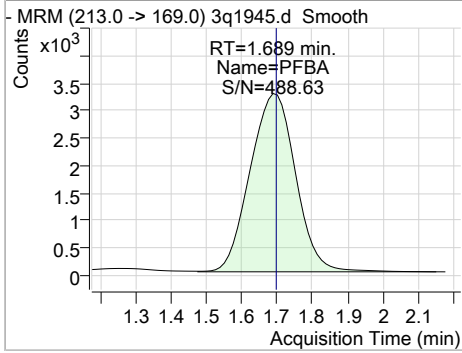
7.1.8
7



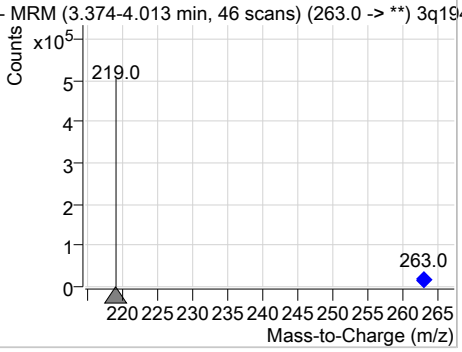
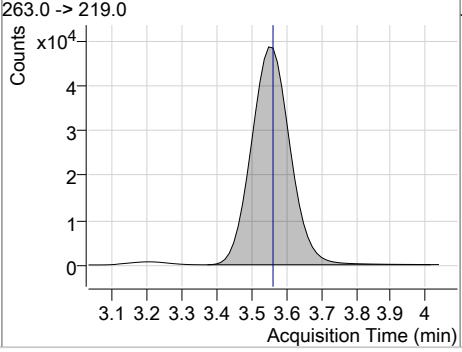
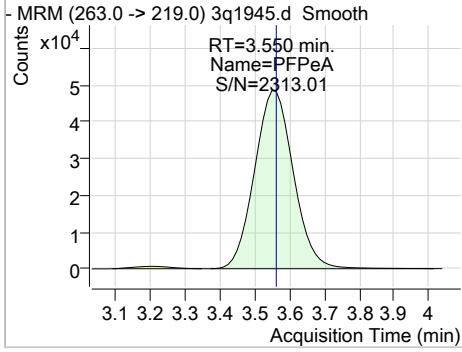
Perfluorinated Compounds by LC/MS/MS



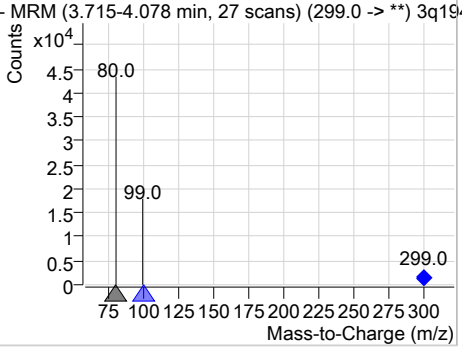
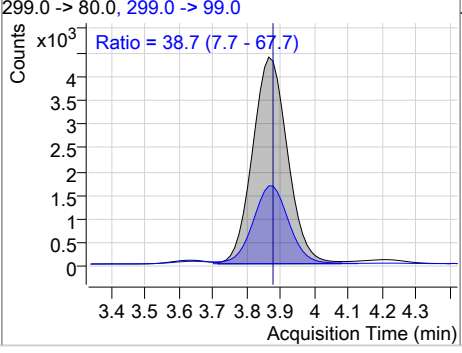
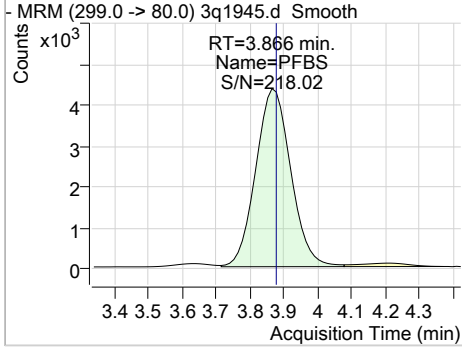
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	9.77	1.69	-0.01	29092				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	44.37	3.55	-0.01	374842				

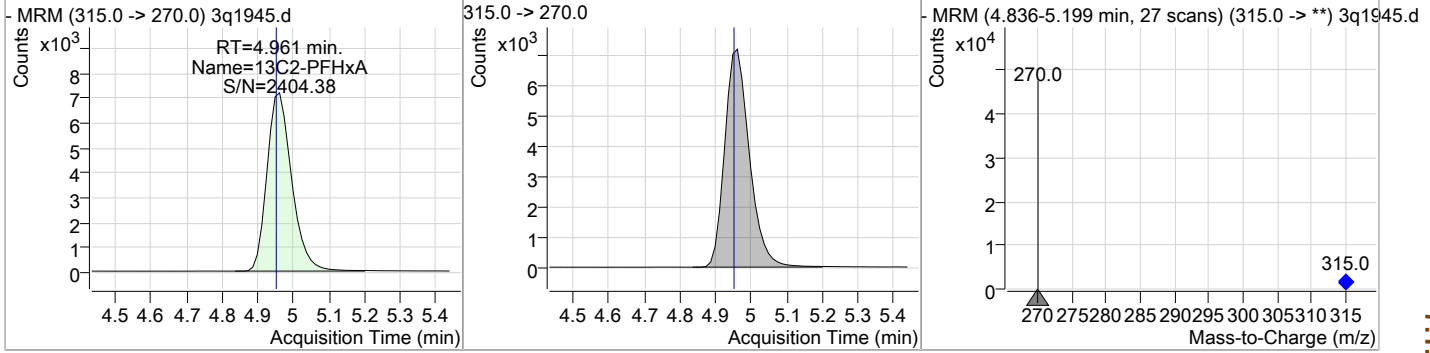


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	11.83	3.87	-0.01	31207	299.0 -> 99.0	38.7	7.7	67.7

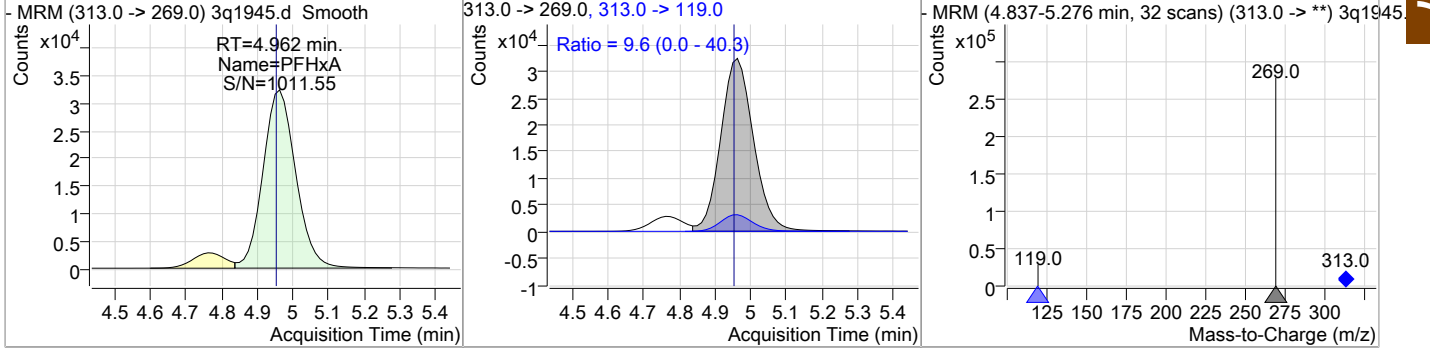


Perfluorinated Compounds by LC/MS/MS

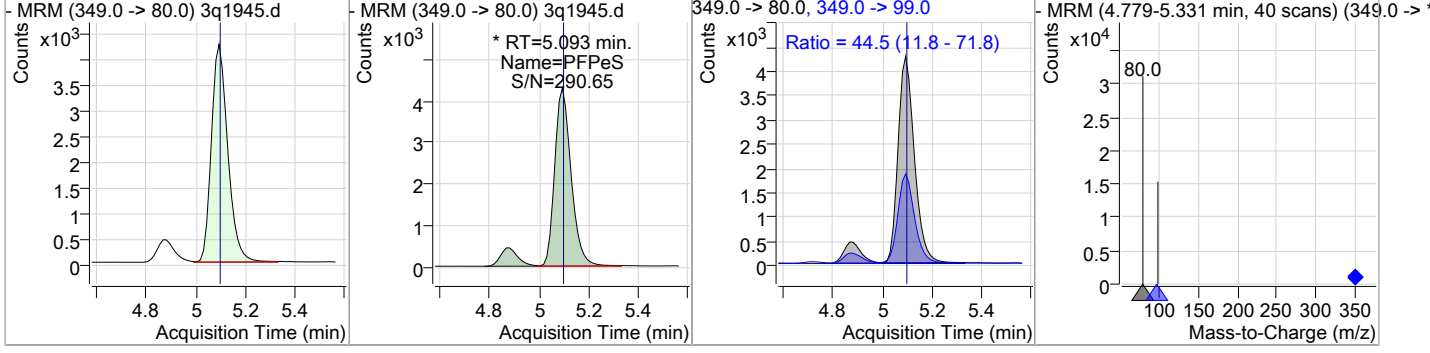
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



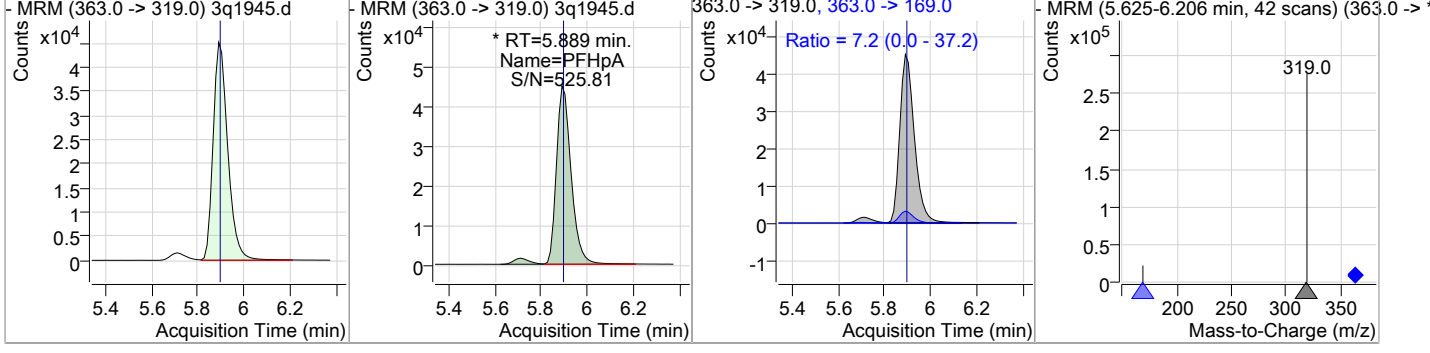
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



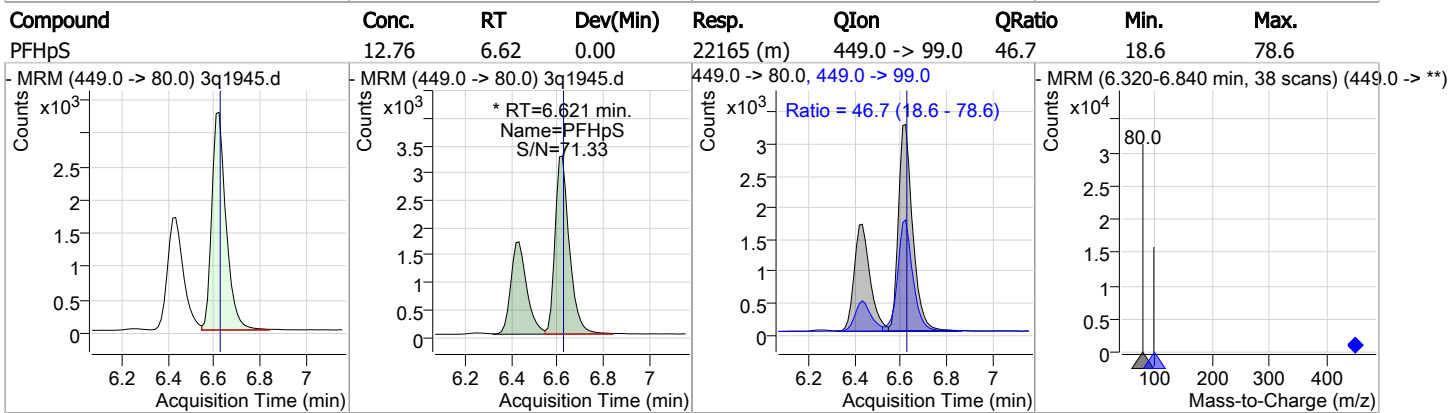
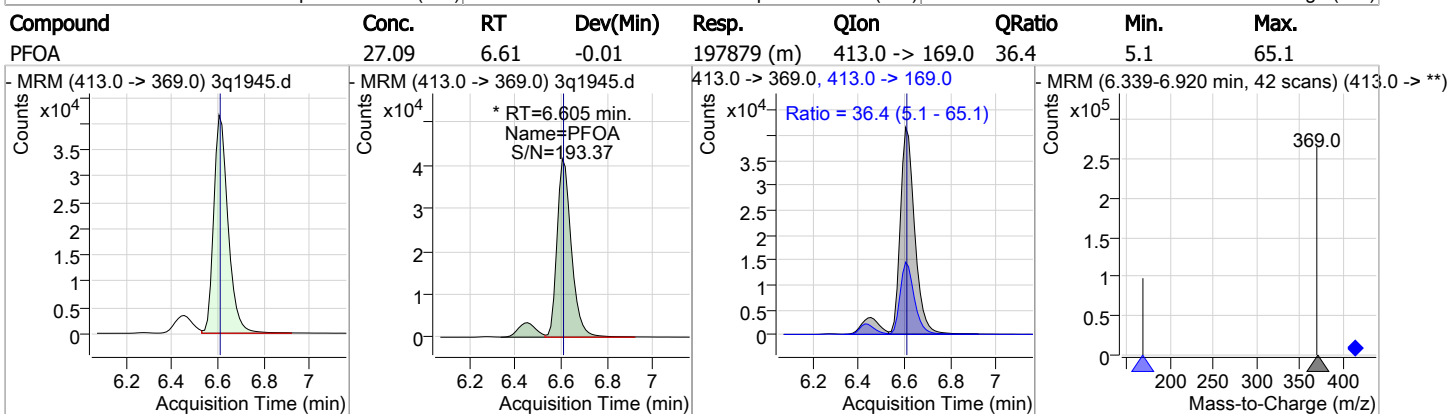
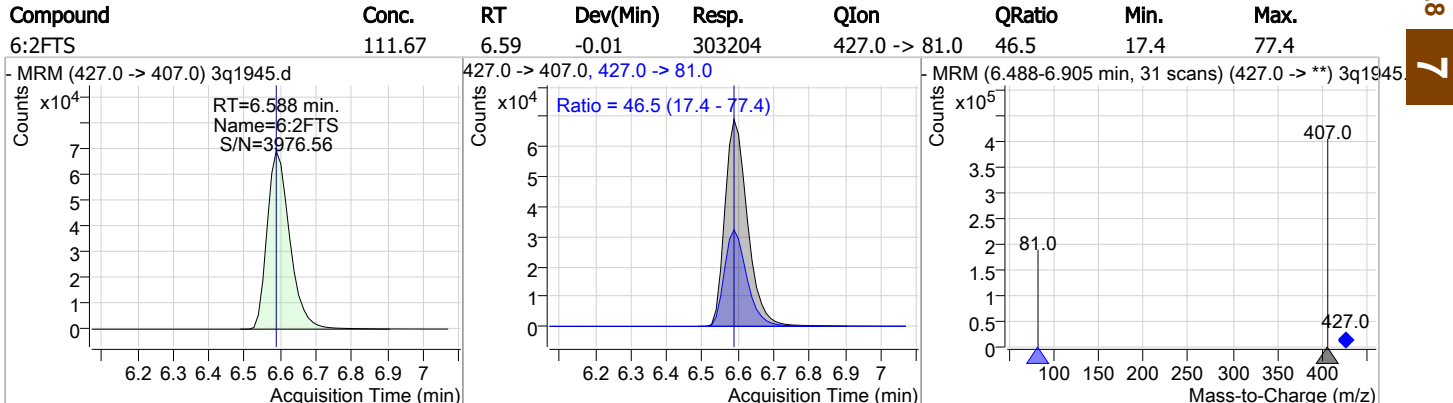
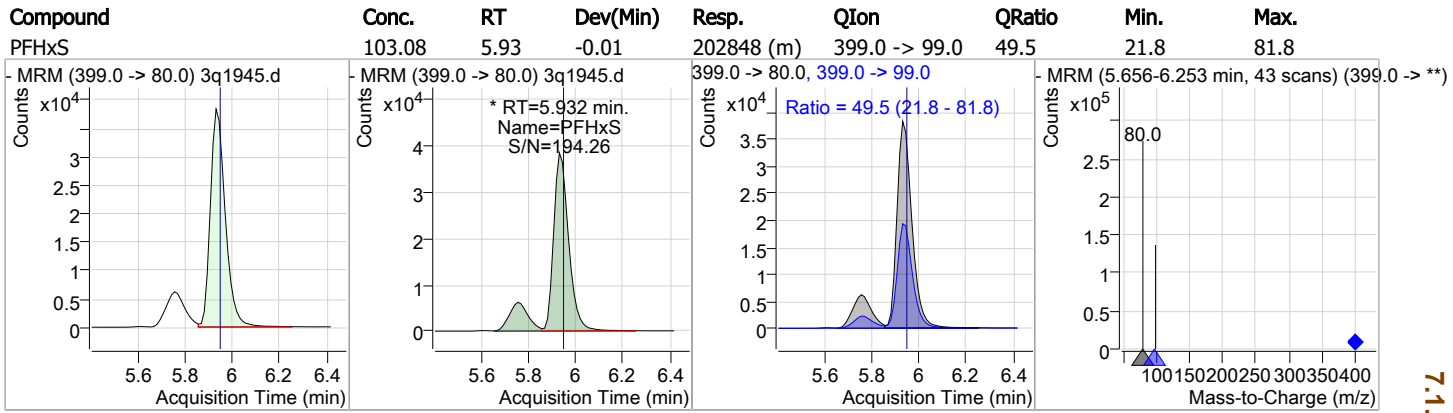
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



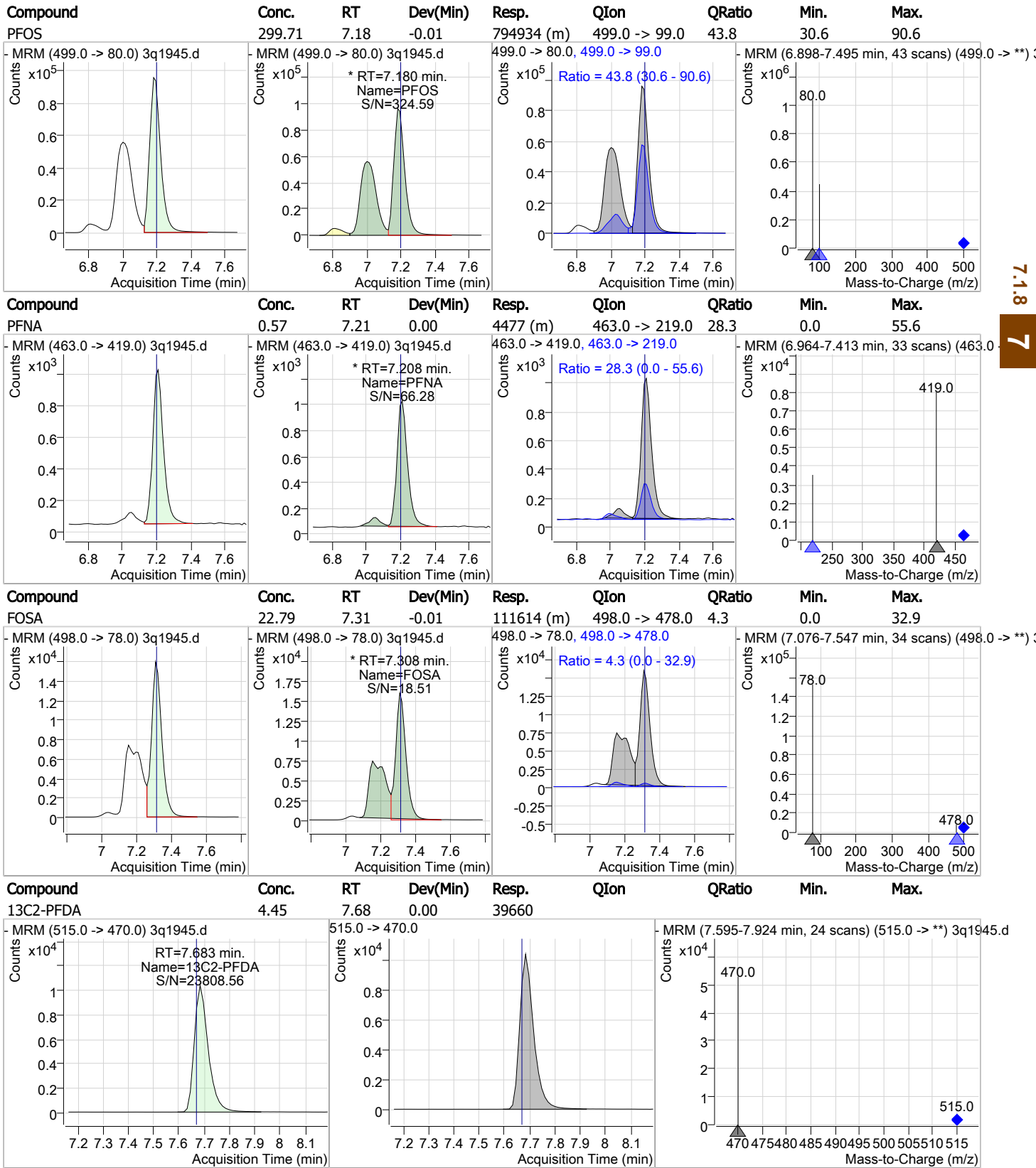
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

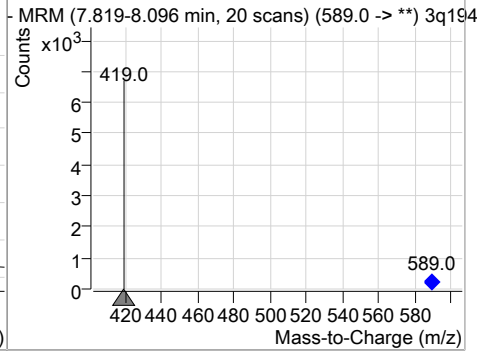
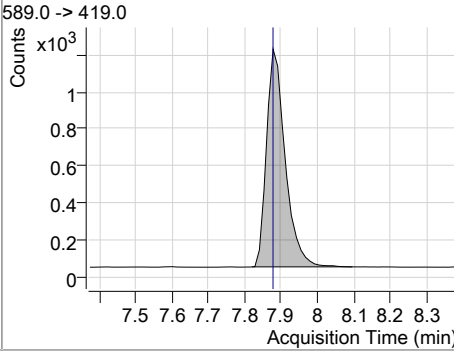
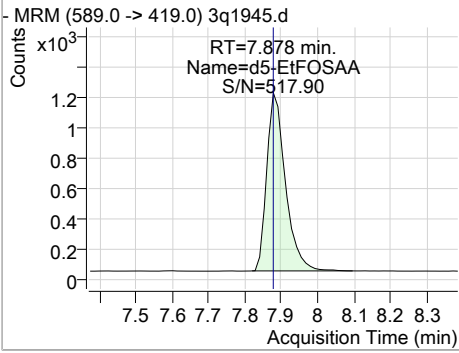


7.18



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	3.53	7.88	-0.01	4211				



7.1.8
7



Manual Integration Approval Summary

Sample Number: FA62248-7 **Method:** EPA 537 MOD
Lab FileID: 3Q1945.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 13:31 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.09	Split peak
Perfluoroheptanoic acid	375-85-9		5.89	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanoic acid	335-67-1		6.61	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak
Perfluorononanoic acid	375-95-1		7.21	Split peak
PFOSA	754-91-6		7.31	Split peak

7.18.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1946.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 1:46:52 PM
 Sample Name : fa62248-7
 Vial : P1-D9
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,100,,,1.0,25,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	41144	20.00	µg/L	0.000
13C2-PFDoDA	8.419	615.0 -> 570.0	163418	20.00	µg/L	0.013
13C2-PFOA	6.616	415.0 -> 370.0	177901	20.00	µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	127739	20.00	µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	51805	20.00	µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	20009	20.00	µg/L	0.000
System Monitoring Compounds						
13C2-PFDA	7.696	515.0 -> 470.0	0	0.00	µg/L	m 0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C2-PFHxA	4.961	315.0 -> 270.0	0	0.00	µg/L	m 0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
d5-EtFOSAA	7.890	589.0 -> 419.0	0	0.00	µg/L	m 0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%			
Target Compounds						
4:2FTS	-	327.0 -> 307.0	-	N.D.		QValue
6:2FTS	6.601	427.0 -> 407.0	57832	26.83	µg/L	100
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	-	584.0 -> 419.0	-	N.D.		
FOSA	7.321	498.0 -> 78.0	22037	4.53	µg/L	m 95
MeFOSAA	-	570.0 -> 419.0	-	N.D.		
PFBA	1.701	213.0 -> 169.0	5732	1.79	µg/L	100
PFBS	3.878	299.0 -> 80.0	6306	2.01	µg/L	97
PFDA	-	513.0 -> 469.0	-	N.D.		
PFDoDA	-	613.0 -> 569.0	-	N.D.		
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	5.902	363.0 -> 319.0	40406	3.02	µg/L	m 100
PFHpS	6.621	449.0 -> 80.0	4463	2.16	µg/L	m 100
PFHxA	4.962	313.0 -> 269.0	41040	8.53	µg/L	98
PFHxS	5.944	399.0 -> 80.0	40881	17.51	µg/L	m 98
PFNA	-	463.0 -> 419.0	-	N.D.		
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.618	413.0 -> 369.0	39435	5.01	µg/L	m 98
PFOS	7.192	499.0 -> 80.0	164262	52.20	µg/L	m 70
PFPeA	3.562	263.0 -> 219.0	71963	8.02	µg/L	100
PFPeS	5.093	349.0 -> 80.0	4300	2.39	µg/L	m 98
PFTeDA	-	713.0 -> 669.0	-	N.D.		
PFTrDA	-	663.0 -> 619.0	-	N.D.		
PFUnDA	-	563.0 -> 519.0	-	N.D.		
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.1.9

7

Perfluorinated Compounds by LC/MS/MS

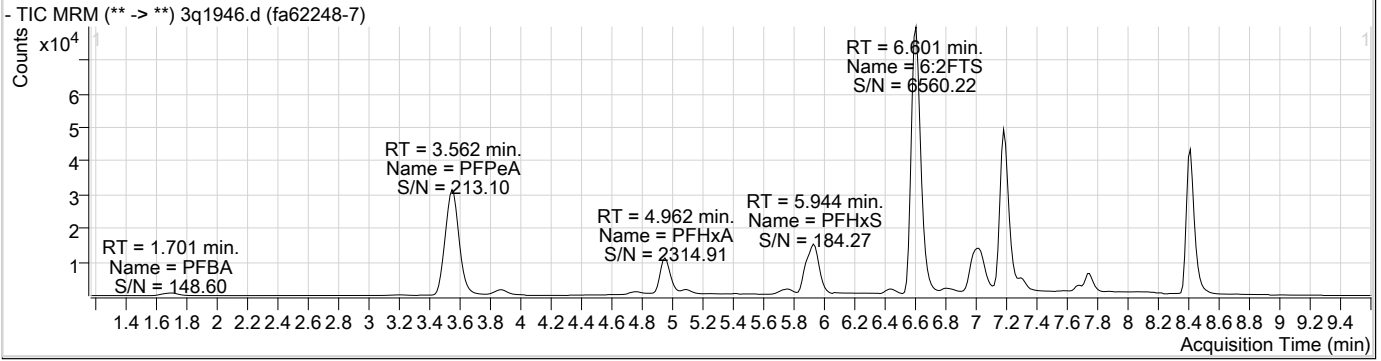
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

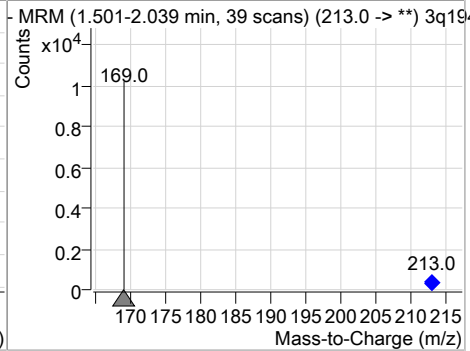
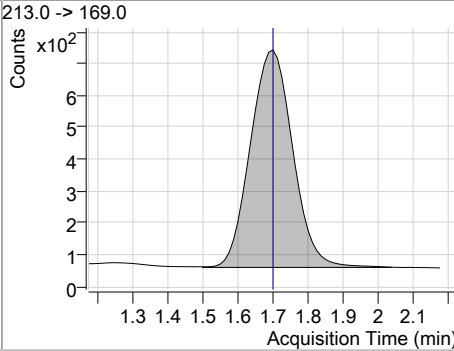
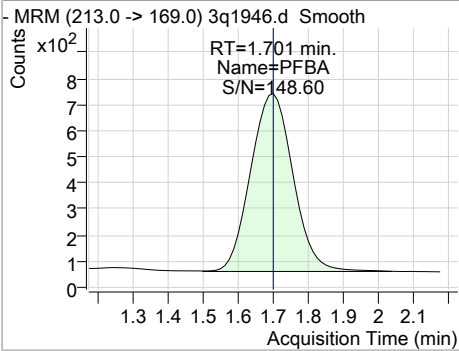
7.1.9
7



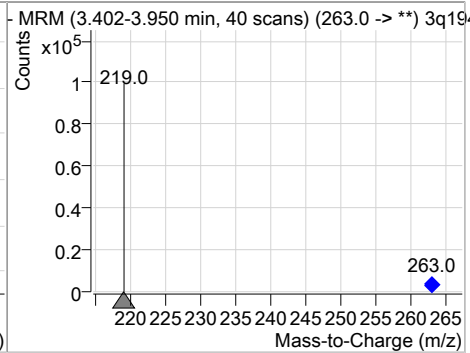
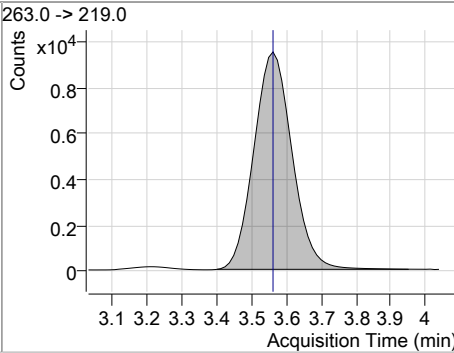
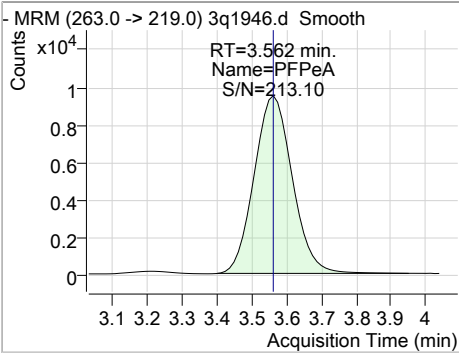
Perfluorinated Compounds by LC/MS/MS



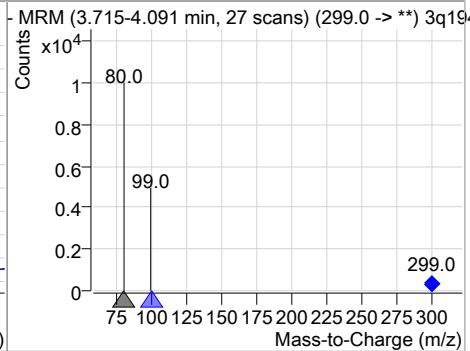
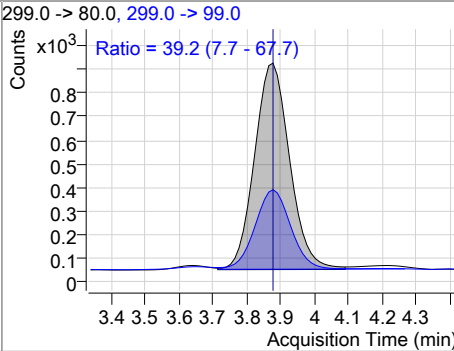
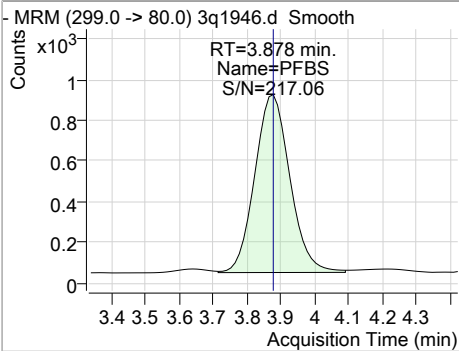
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	1.79	1.70	0.00	5732				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	8.02	3.56	0.00	71963				

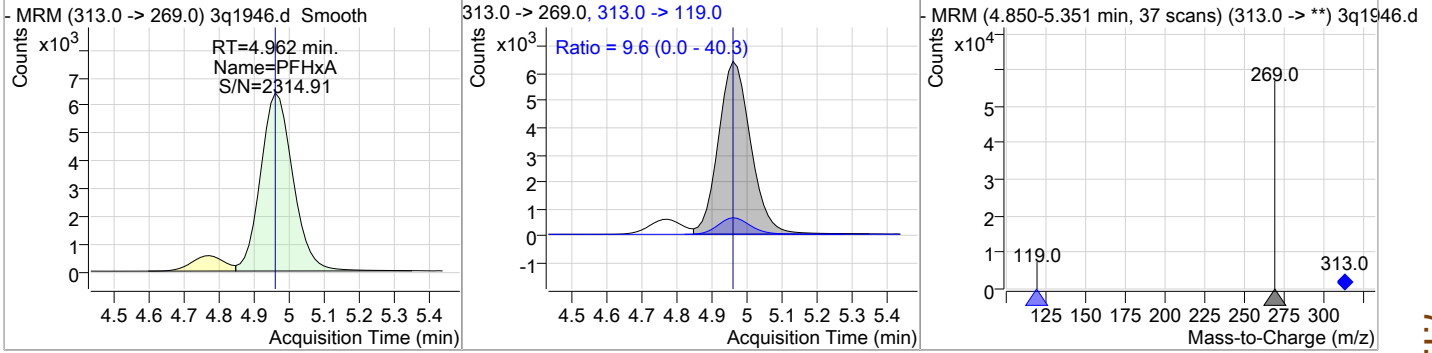


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	2.01	3.88	0.00	6306	299.0 -> 99.0	39.2	7.7	67.7

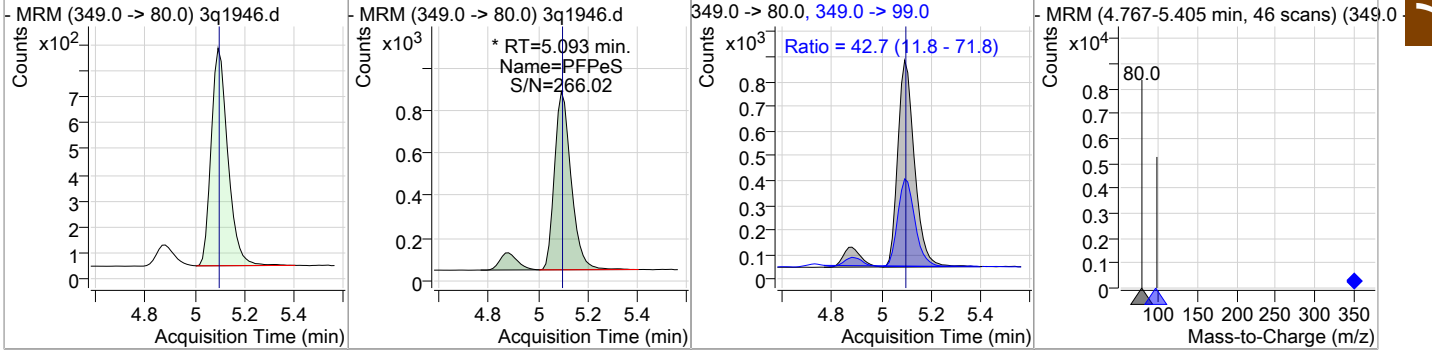


Perfluorinated Compounds by LC/MS/MS

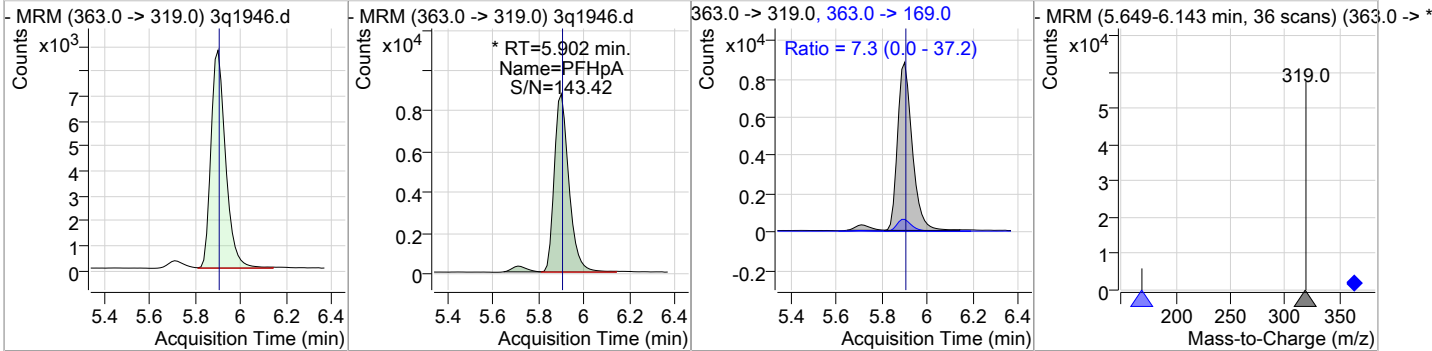
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	8.53	4.96	0.00	41040	313.0 -> 119.0	9.6	0.0	40.3



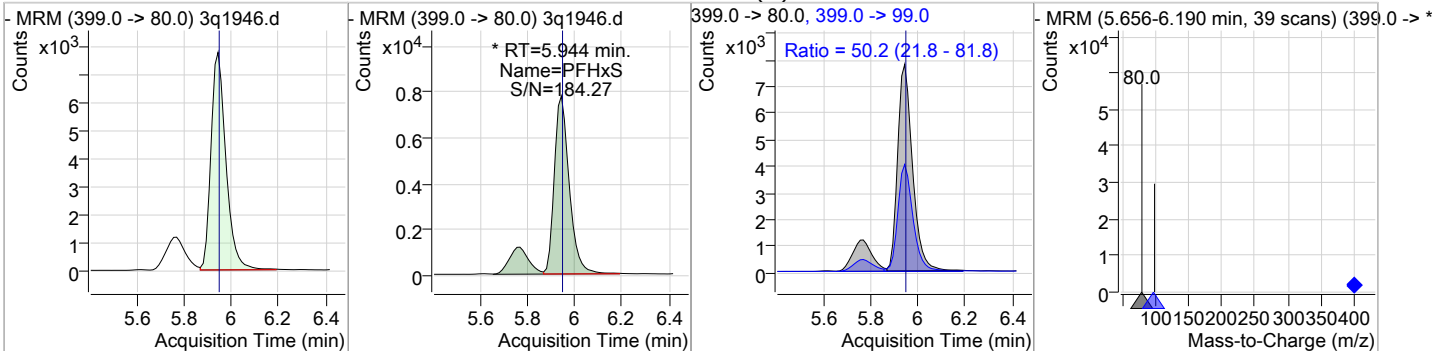
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	2.39	5.09	0.00	4300 (m)	349.0 -> 99.0	42.7	11.8	71.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	3.02	5.90	0.00	40406 (m)	363.0 -> 169.0	7.3	0.0	37.2

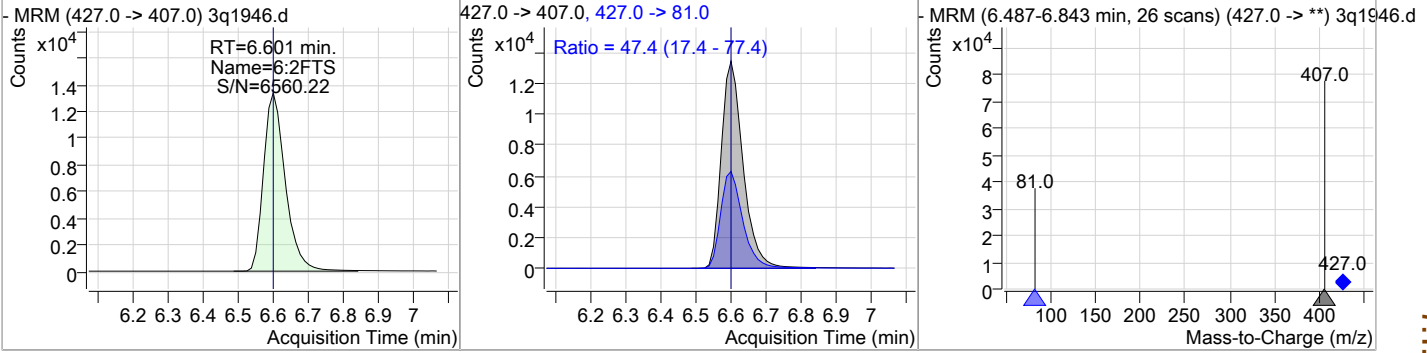


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	17.51	5.94	0.00	40881 (m)	399.0 -> 99.0	50.2	21.8	81.8

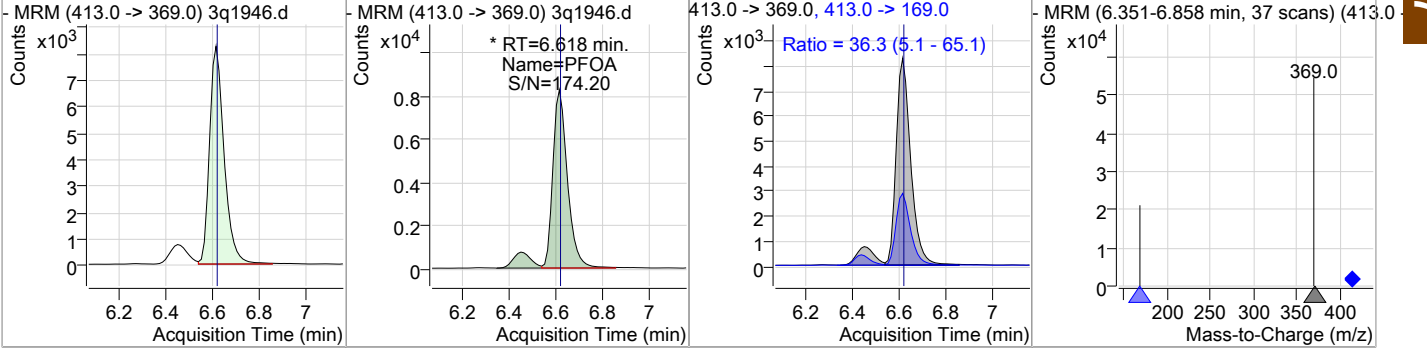


Perfluorinated Compounds by LC/MS/MS

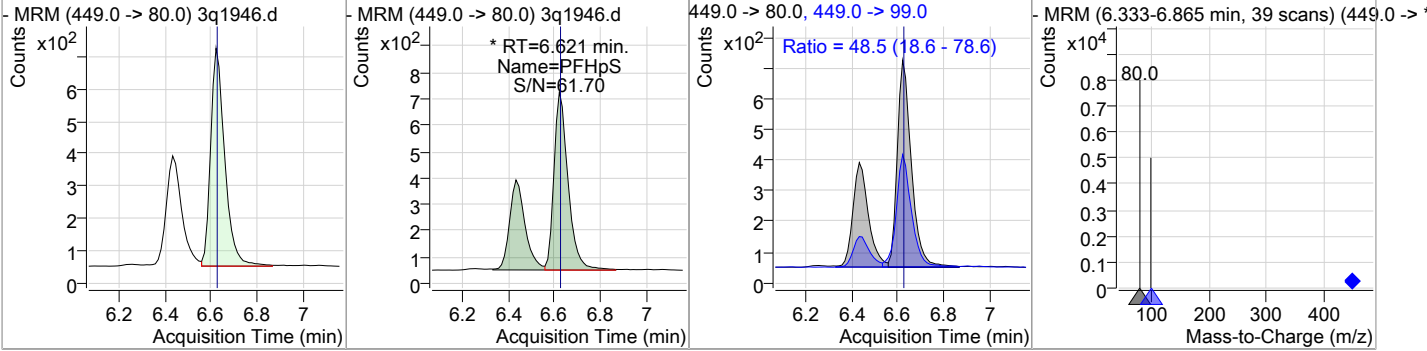
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	26.83	6.60	0.00	57832	427.0 -> 81.0	47.4	17.4	77.4



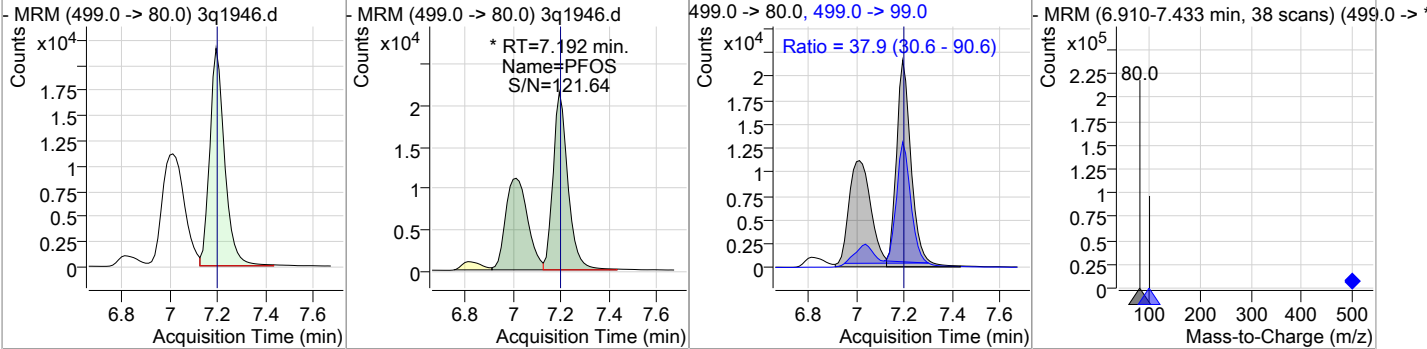
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	5.01	6.62	0.00	39435 (m)	413.0 -> 169.0	36.3	5.1	65.1



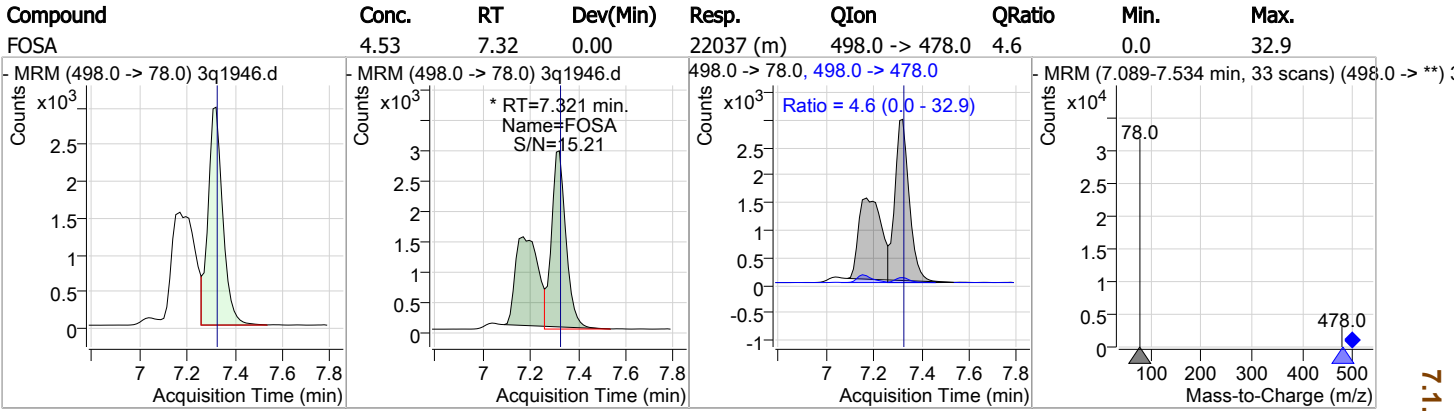
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	2.16	6.62	0.00	4463 (m)	449.0 -> 99.0	48.5	18.6	78.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	52.20	7.19	0.00	164262 (m)	499.0 -> 99.0	37.9	30.6	90.6



Perfluorinated Compounds by LC/MS/MS



7.1.9

7

Manual Integration Approval Summary

Sample Number: FA62248-7
Lab FileID: 3Q1946.D
Injection Time: 03/18/19 13:46

Method: EPA 537 MOD
Analyst approved: 03/18/19 15:25 Nancy Saunders
Supervisor approved: 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.09	Split peak
Perfluoroheptanoic acid	375-85-9		5.90	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanoic acid	335-67-1		6.62	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
PFOSA	754-91-6		7.32	Split peak

7.19.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1914.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 3:37:50 PM
 Sample Name : OP74166-MB
 Vial : P1-B5
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74166,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.612	429.0 -> 409.0	40334	20.00 µg/L	0.013
13C2-PFDoDA	8.419	615.0 -> 570.0	206087	20.00 µg/L	0.013
13C2-PFOA	6.629	415.0 -> 370.0	196999	20.00 µg/L	0.013
13C3-PFPeA	3.572	266.0 -> 222.0	147784	20.00 µg/L	0.013
13C4-PFOS	7.204	503.0 -> 80.0	59253	20.00 µg/L	0.013
d3-MeFOSAA	7.754	573.0 -> 419.0	22577	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.696	515.0 -> 470.0	233191	22.24 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 111.2%	
13C2-PFHxA	4.974	315.0 -> 270.0	228654	21.02 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 105.1%	
d5-EtFOSAA	7.890	589.0 -> 419.0	24258	18.60 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 93.0%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.2.1
7

Perfluorinated Compounds by LC/MS/MS

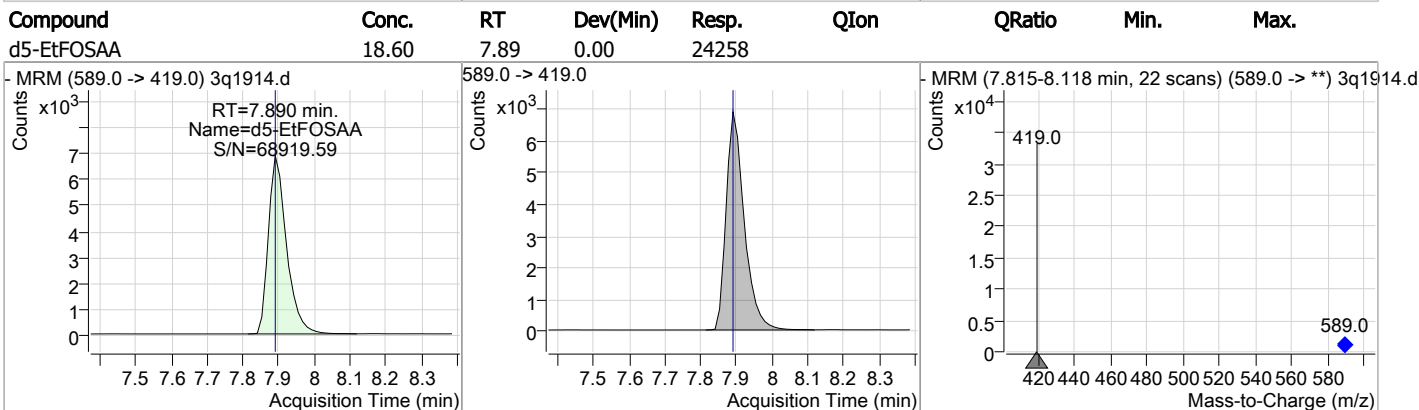
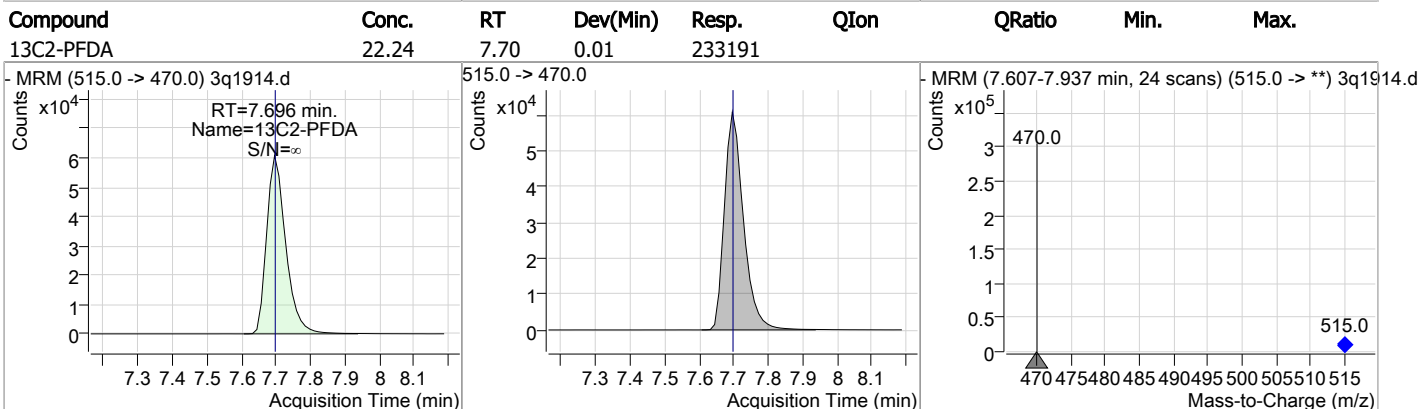
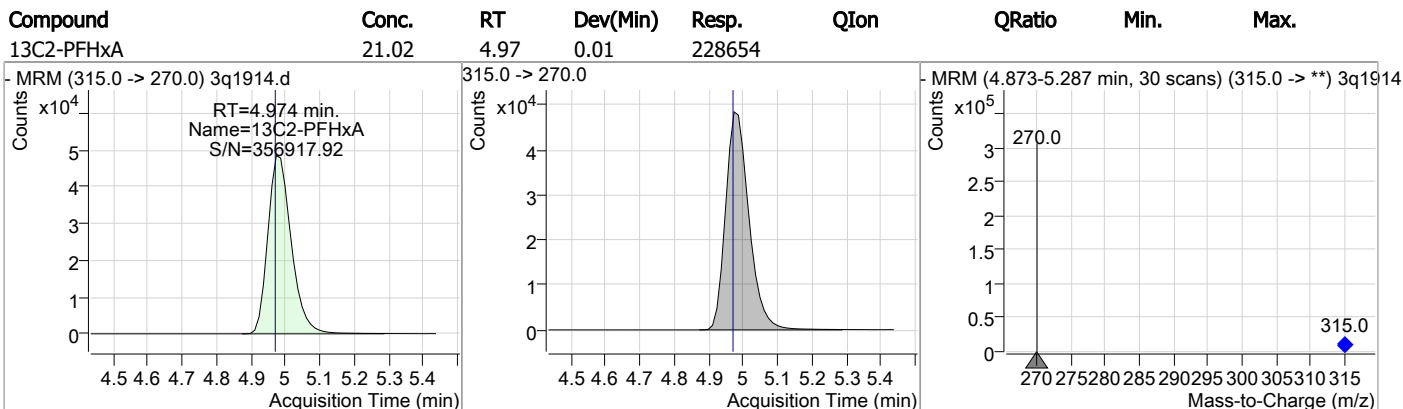
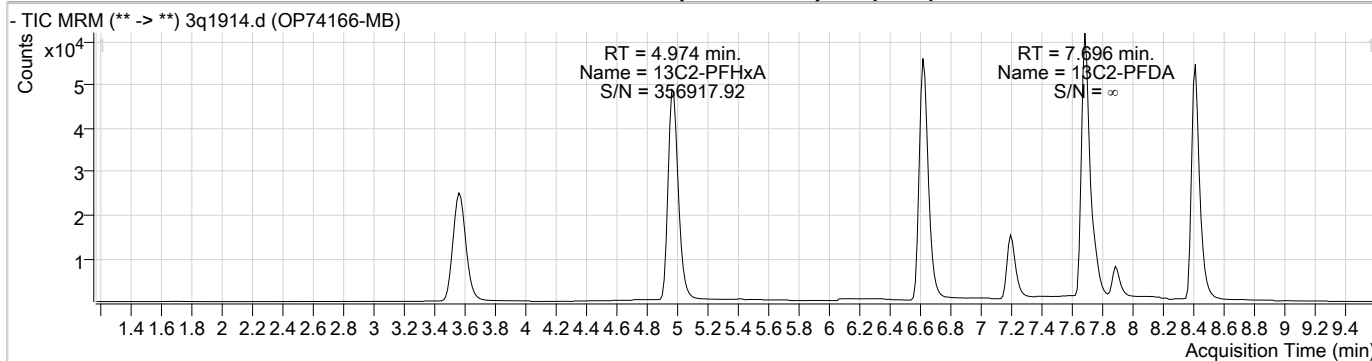
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.2.1

7

Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

Data File : 3q1913.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 3:22:30 PM
 Sample Name : OP74166-BS
 Vial : P1-B4
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74166,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.612	429.0 -> 409.0	40793	20.00 µg/L	0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	194809	20.00 µg/L	0.000
13C2-PFOA	6.629	415.0 -> 370.0	183696	20.00 µg/L	0.013
13C3-PFPeA	3.572	266.0 -> 222.0	144141	20.00 µg/L	0.013
13C4-PFOS	7.204	503.0 -> 80.0	57763	20.00 µg/L	0.013
d3-MeFOSAA	7.754	573.0 -> 419.0	21653	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.696	515.0 -> 470.0	224174	22.94 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 114.7%	
13C2-PFHxA	4.974	315.0 -> 270.0	230302	22.69 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 113.4%	
d5-EtFOSAA	7.890	589.0 -> 419.0	22920	18.32 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 91.6%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.871	327.0 -> 307.0	51332	20.04 µg/L	QValue 98
6:2FTS	6.613	427.0 -> 407.0	43258	20.24 µg/L	99
8:2FTS	7.720	527.0 -> 507.0	26997	20.03 µg/L	92
EtFOSAA	7.891	584.0 -> 419.0	16067	15.92 µg/L	98
FOSA	7.321	498.0 -> 78.0	93365	18.06 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	21300	17.22 µg/L	100
PFBA	1.701	213.0 -> 169.0	62834	18.98 µg/L	100
PFBS	3.891	299.0 -> 80.0	66986	19.19 µg/L	98
PFDA	7.684	513.0 -> 469.0	151324	21.80 µg/L	98
PFDoDA	8.408	613.0 -> 569.0	147582	15.79 µg/L	99
PFDS	8.041	599.0 -> 80.0	7638	15.43 µg/L	95
PFHpA	5.914	363.0 -> 319.0	266830	19.33 µg/L	99
PFHpS	6.634	449.0 -> 80.0	45992	20.01 µg/L	97
PFHxA	4.975	313.0 -> 269.0	93980	18.91 µg/L	98
PFHxS	5.957	399.0 -> 80.0	51775	19.89 µg/L	m 97
PFNA	7.208	463.0 -> 419.0	174841	20.08 µg/L	99
PFNS	7.667	549.0 -> 80.0	34378	17.72 µg/L	99
PFOA	6.630	413.0 -> 369.0	165077	20.32 µg/L	98
PFOS	7.192	499.0 -> 80.0	65161	18.57 µg/L	m 84
PFPeA	3.575	263.0 -> 219.0	201605	19.91 µg/L	100
PFPeS	5.105	349.0 -> 80.0	39515	19.49 µg/L	99
PFTeDA	9.016	713.0 -> 669.0	224780	18.41 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	198908	19.40 µg/L	99
PFUnDA	8.084	563.0 -> 519.0	145649	17.21 µg/L	99
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.3.1
7

Perfluorinated Compounds by LC/MS/MS

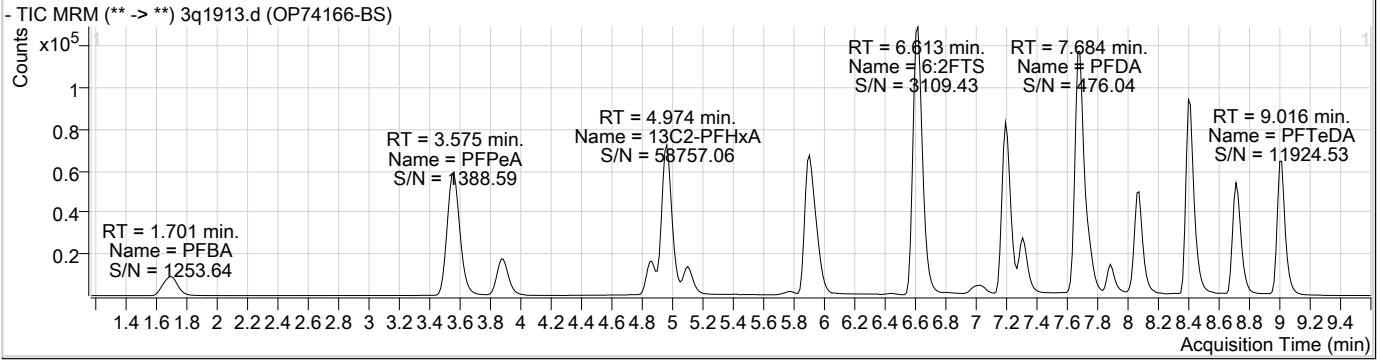
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

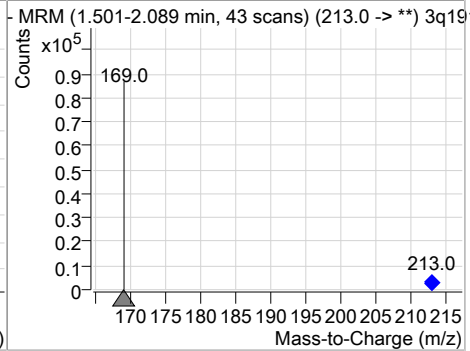
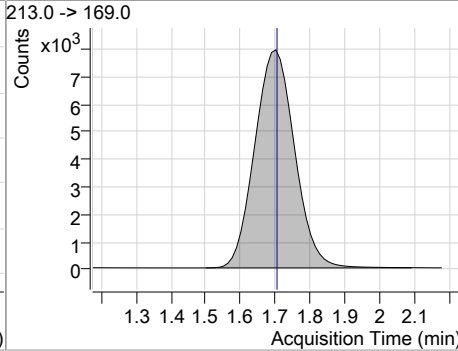
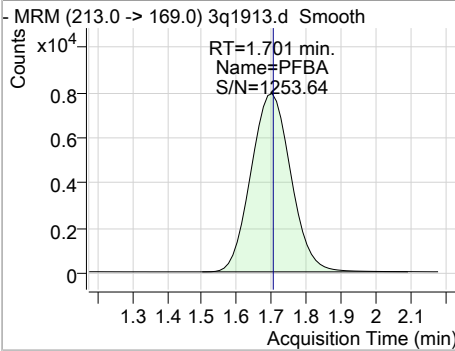
7.3.1

7

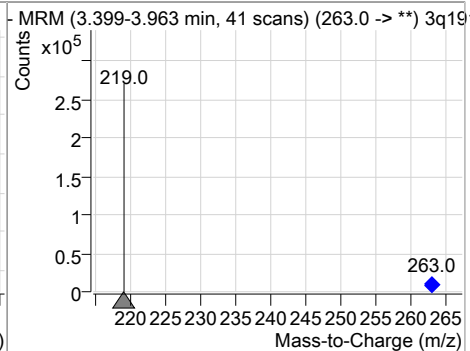
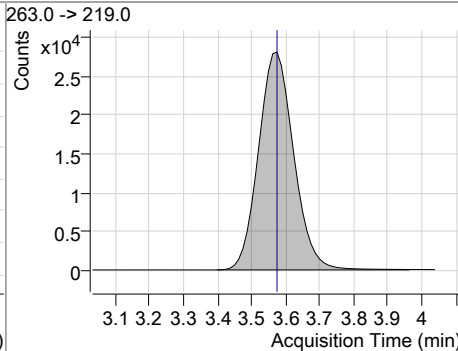
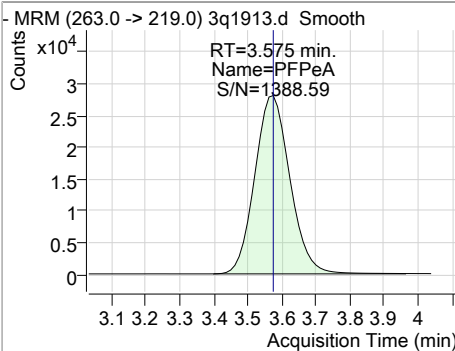
Perfluorinated Compounds by LC/MS/MS



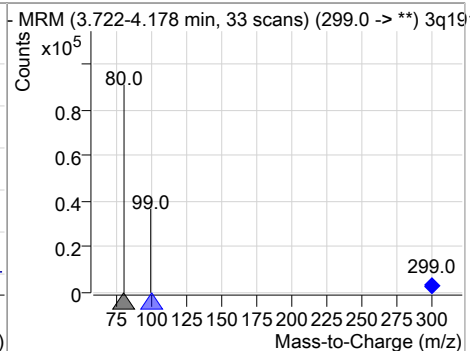
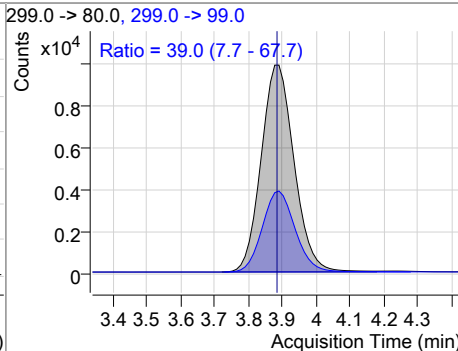
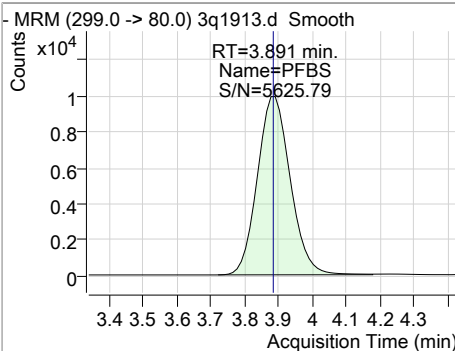
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	18.98	1.70	0.00	62834				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	19.91	3.57	0.01	201605				

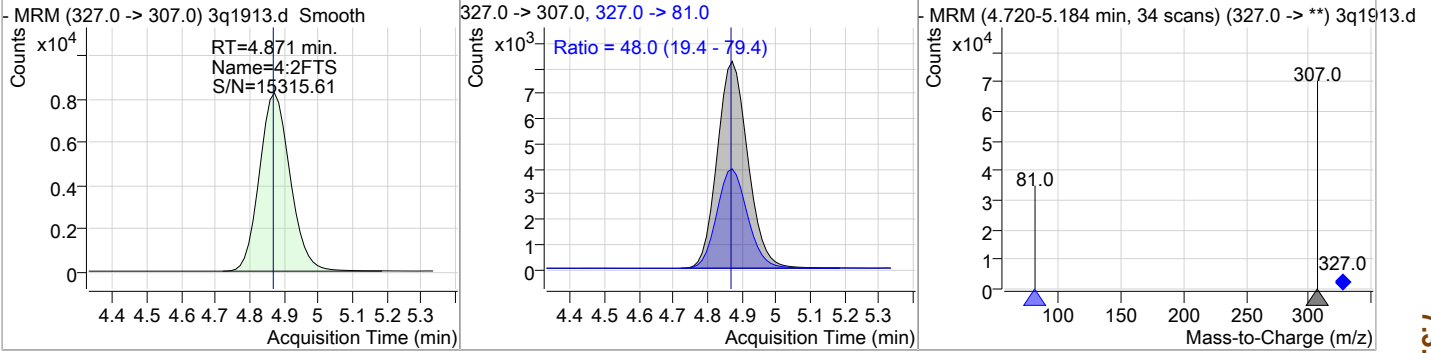


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	19.19	3.89	0.01	66986	299.0 -> 99.0	39.0	7.7	67.7

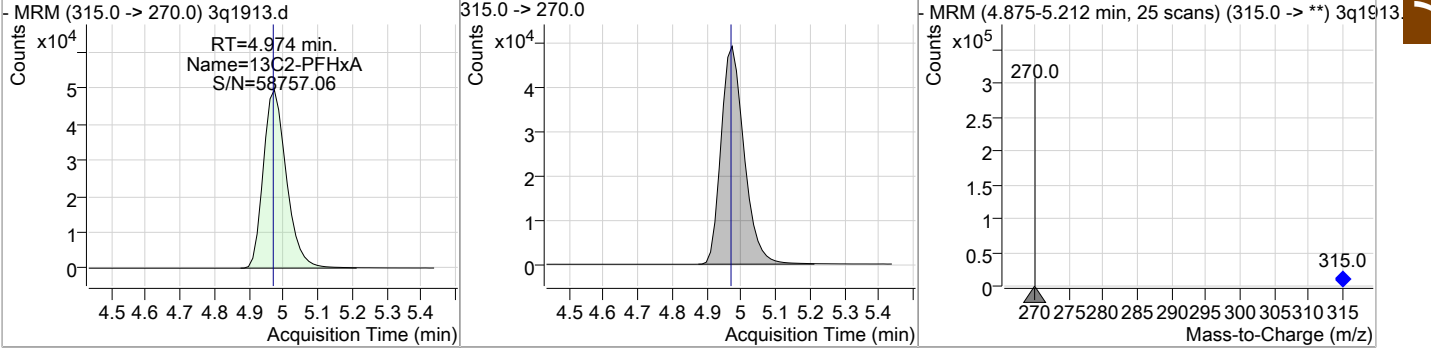


Perfluorinated Compounds by LC/MS/MS

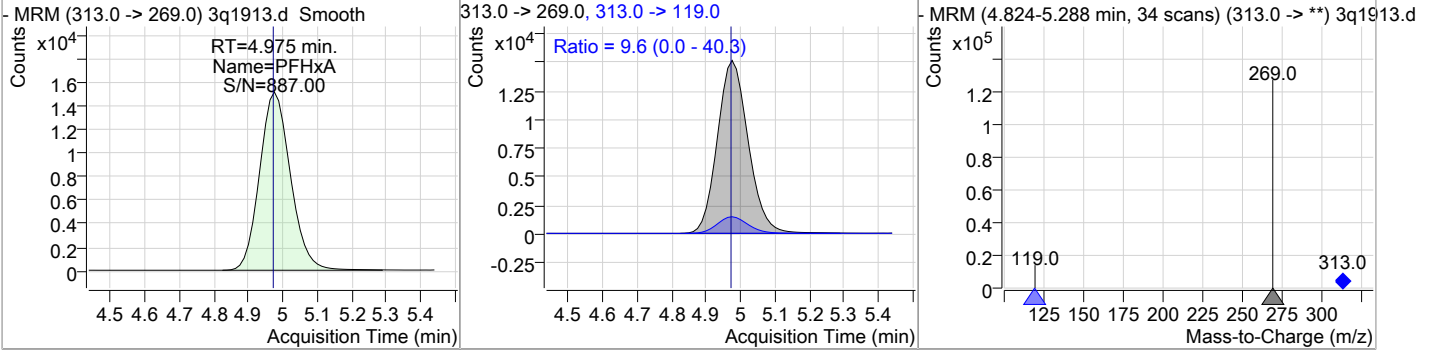
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	20.04	4.87	0.01	51332	327.0 -> 81.0	48.0	19.4	79.4



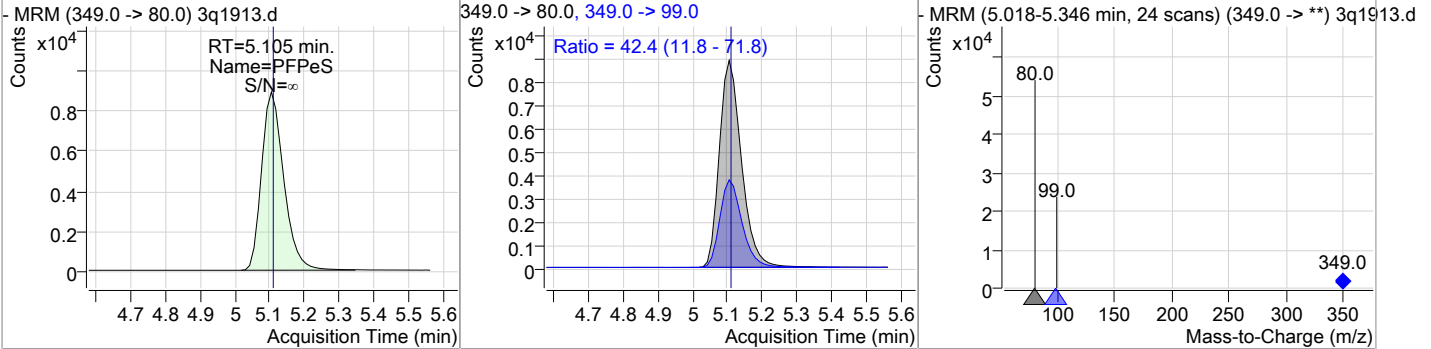
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	22.69	4.97	0.01	230302				



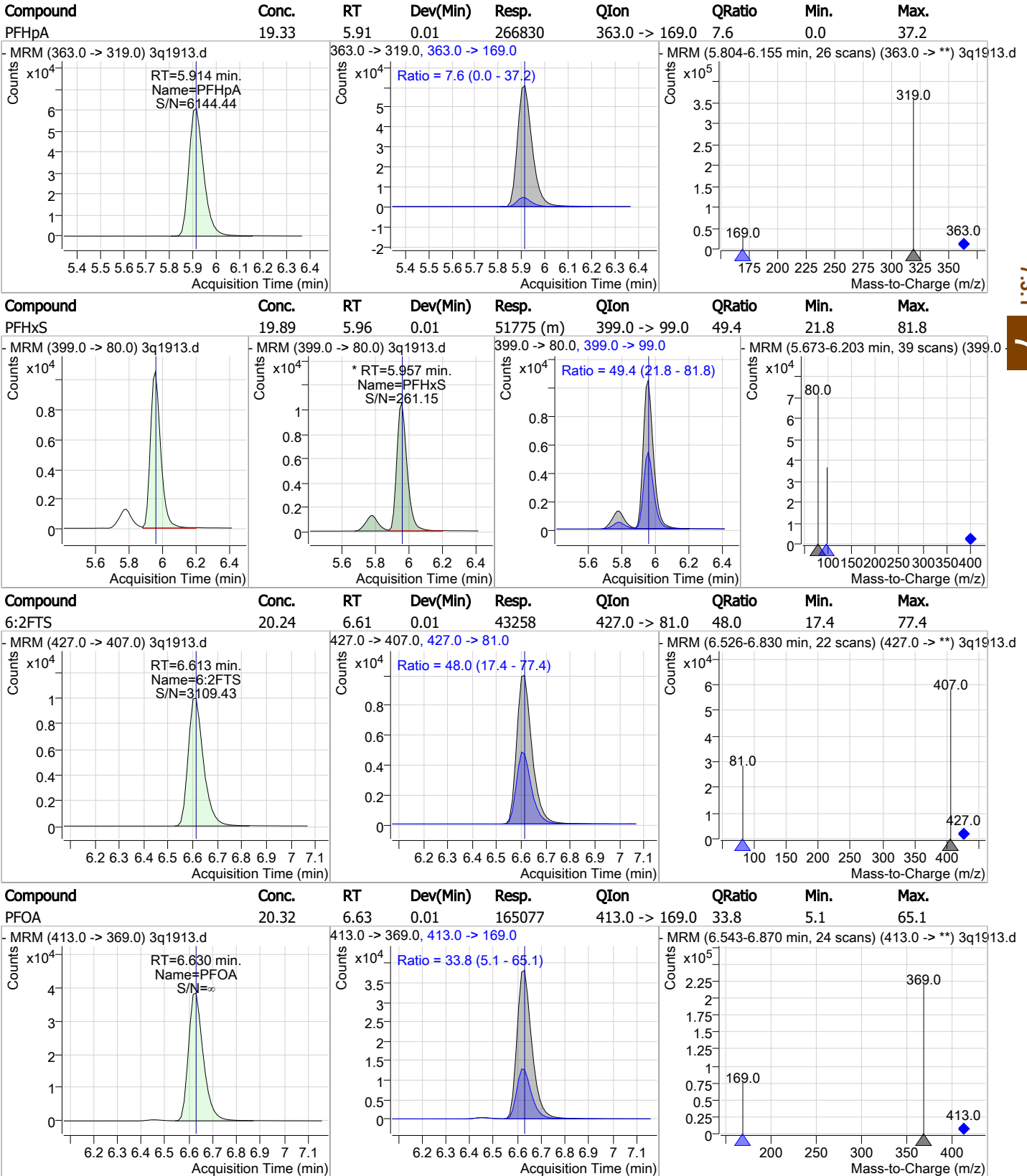
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.91	4.97	0.01	93980	313.0 -> 119.0	9.6	0.0	40.3



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.49	5.11	0.01	39515	349.0 -> 99.0	42.4	11.8	71.8



Perfluorinated Compounds by LC/MS/MS

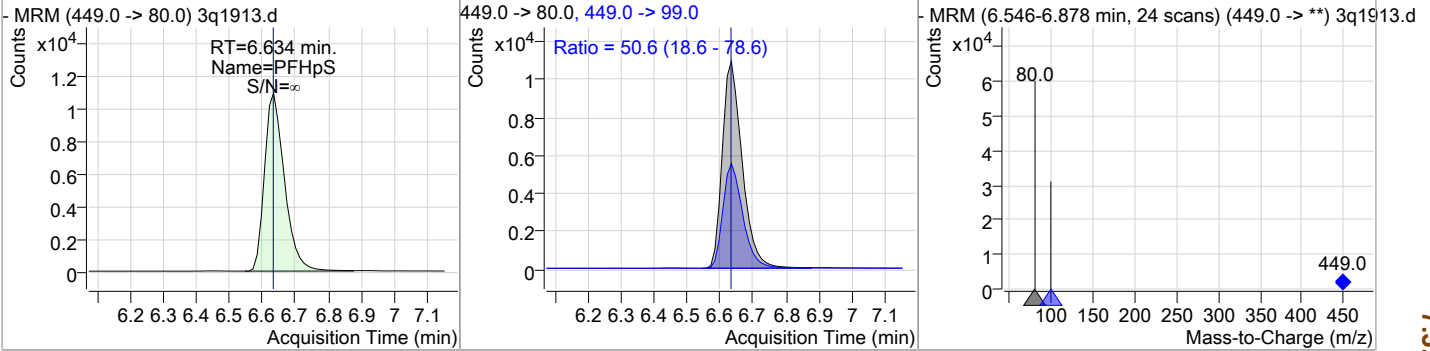


7.3.1
7

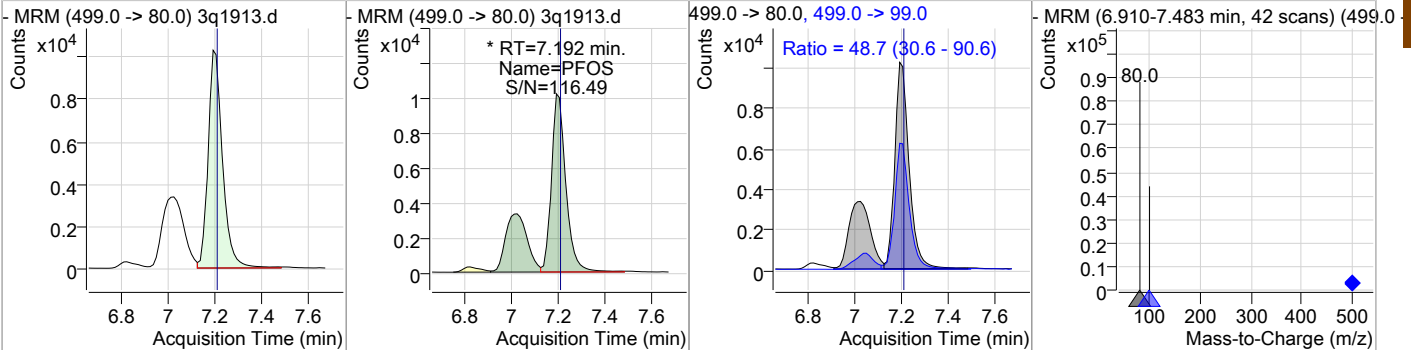


Perfluorinated Compounds by LC/MS/MS

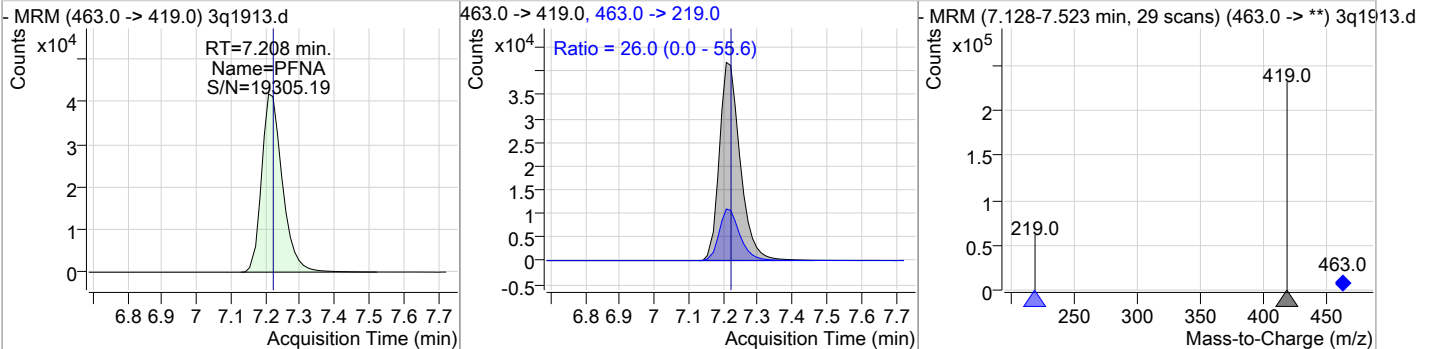
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	20.01	6.63	0.01	45992	449.0 -> 99.0	50.6	18.6	78.6



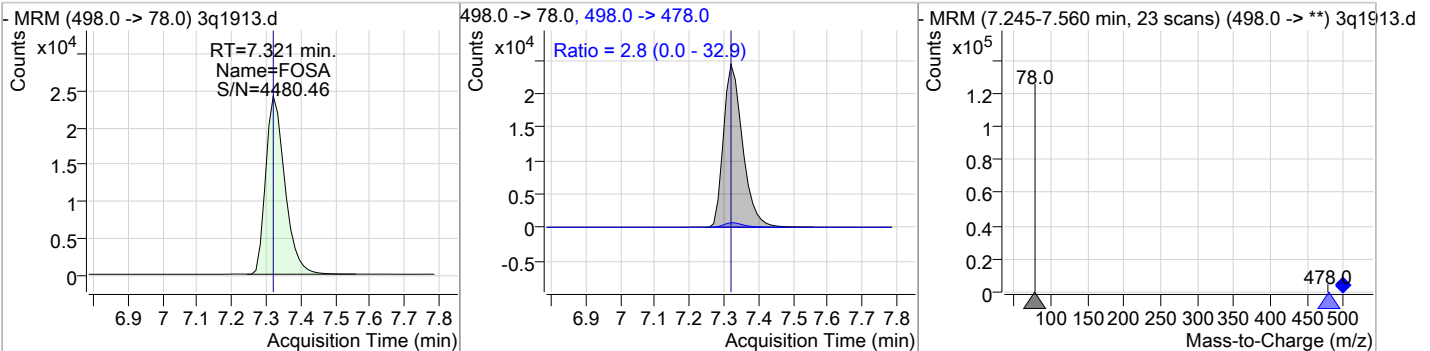
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	18.57	7.19	0.00	65161 (m)	499.0 -> 99.0	48.7	30.6	90.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	20.08	7.21	0.00	174841	463.0 -> 219.0	26.0	0.0	55.6

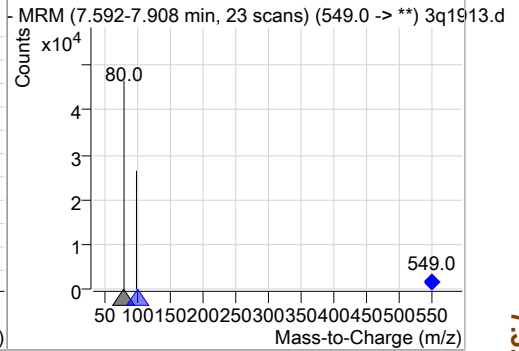
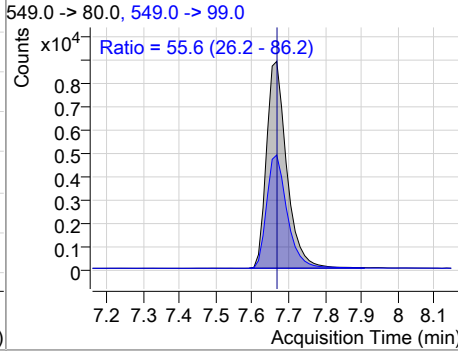
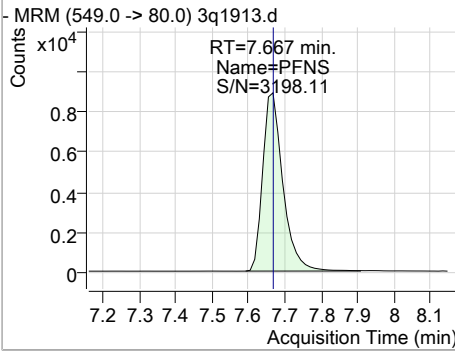


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
FOSA	18.06	7.32	0.00	93365	498.0 -> 478.0	2.8	0.0	32.9

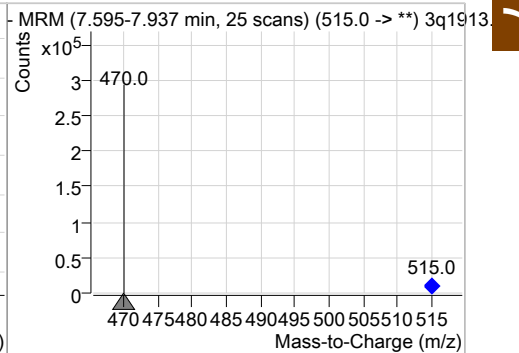
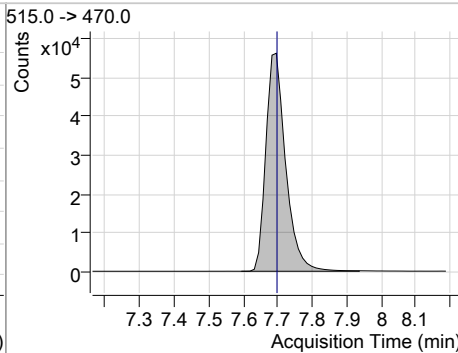
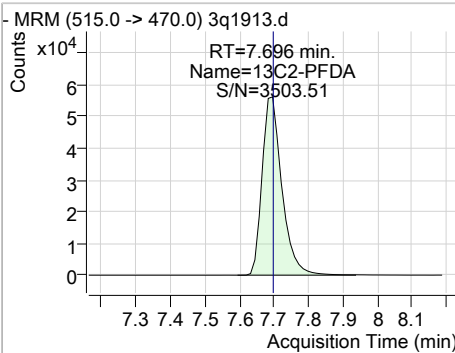


Perfluorinated Compounds by LC/MS/MS

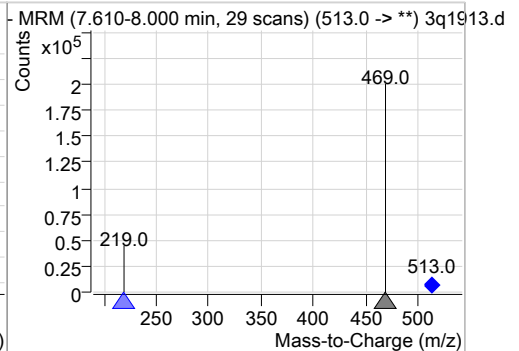
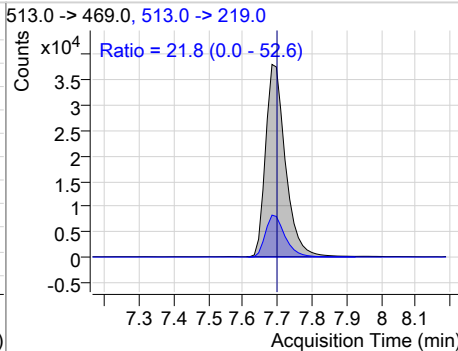
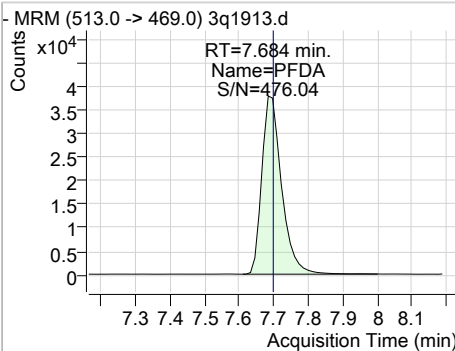
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	17.72	7.67	0.01	34378	549.0 -> 99.0	55.6	26.2	86.2



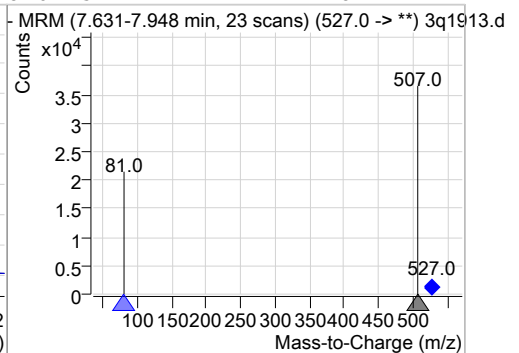
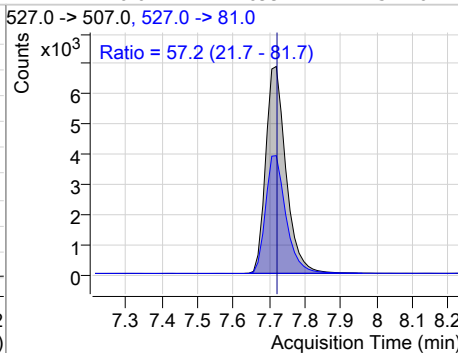
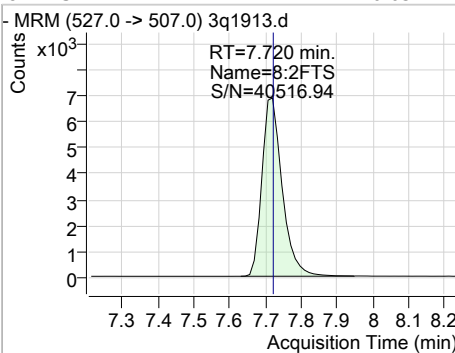
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	22.94	7.70	0.01	224174	515.0 -> 470.0	515.0 -> 470.0	470.0	515.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	21.80	7.68	0.00	151324	513.0 -> 219.0	21.8	0.0	52.6

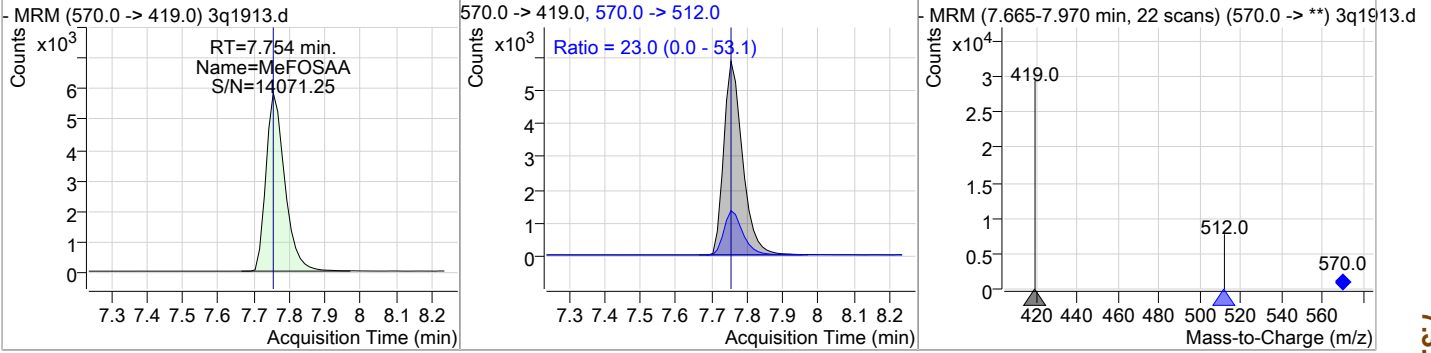


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	20.03	7.72	0.01	26997	527.0 -> 81.0	57.2	21.7	81.7

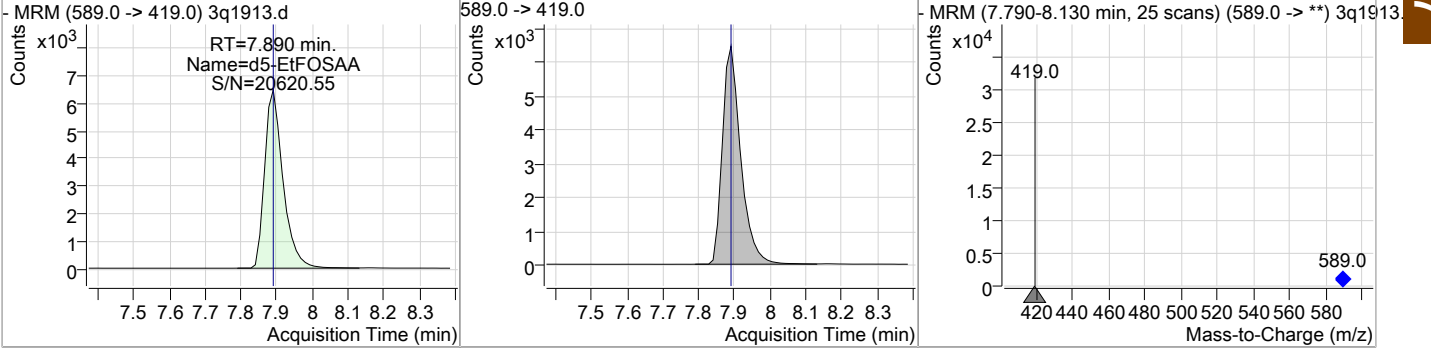


Perfluorinated Compounds by LC/MS/MS

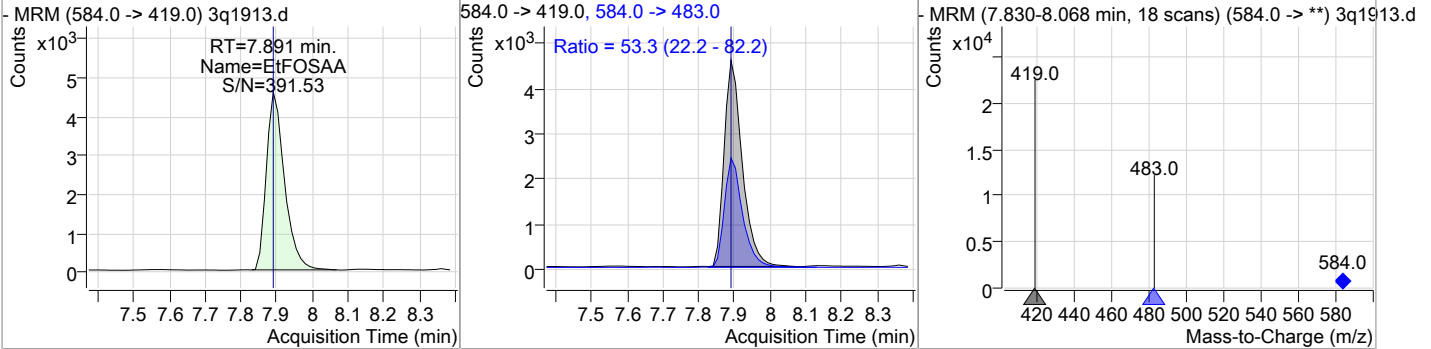
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	17.22	7.75	0.00	21300	570.0 -> 512.0	23.0	0.0	53.1



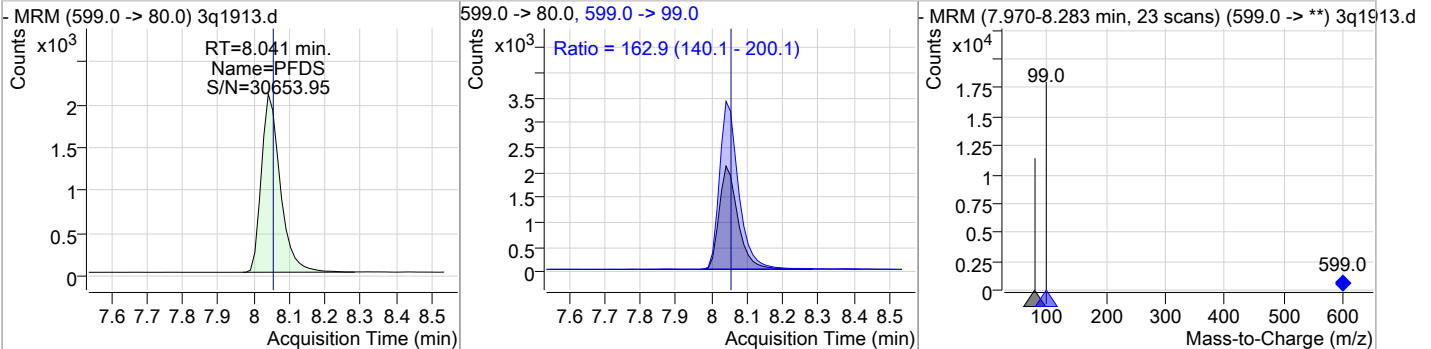
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	18.32	7.89	0.00	22920				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	15.92	7.89	0.00	16067	584.0 -> 483.0	53.3	22.2	82.2

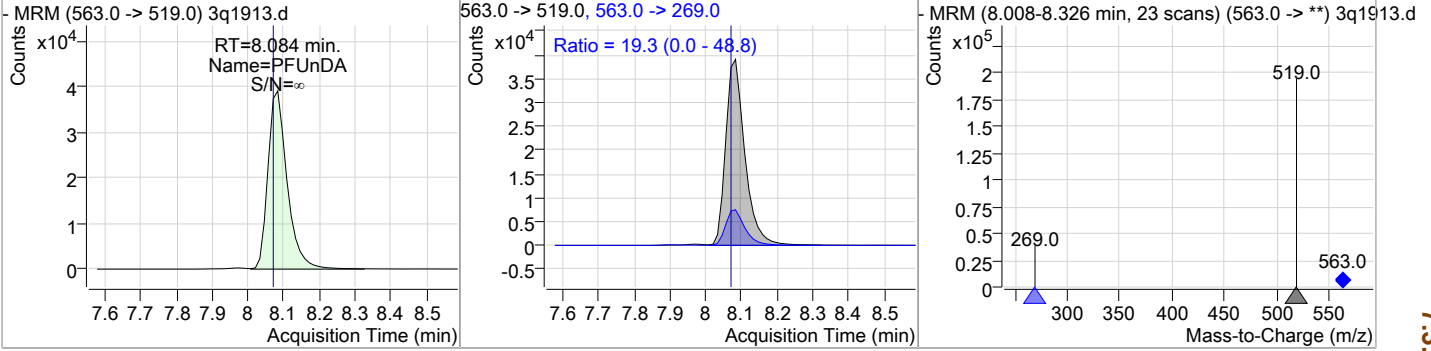


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	15.43	8.04	0.00	7638	599.0 -> 99.0	162.9	140.1	200.1

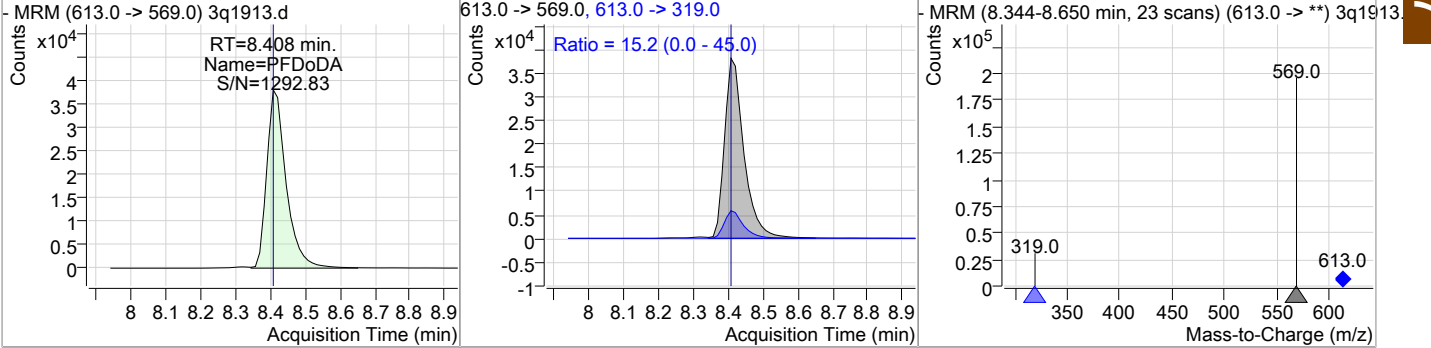


Perfluorinated Compounds by LC/MS/MS

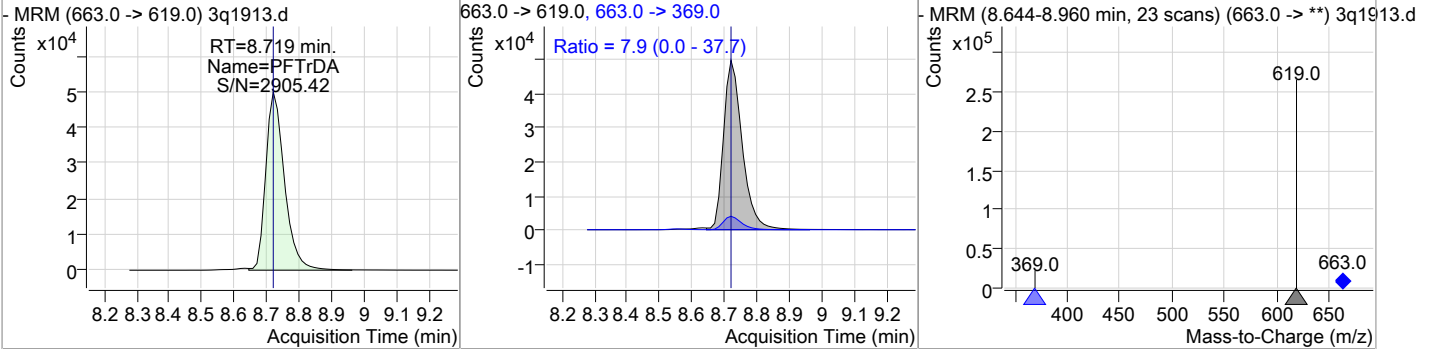
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	17.21	8.08	0.01	145649	563.0 -> 269.0	19.3	0.0	48.8



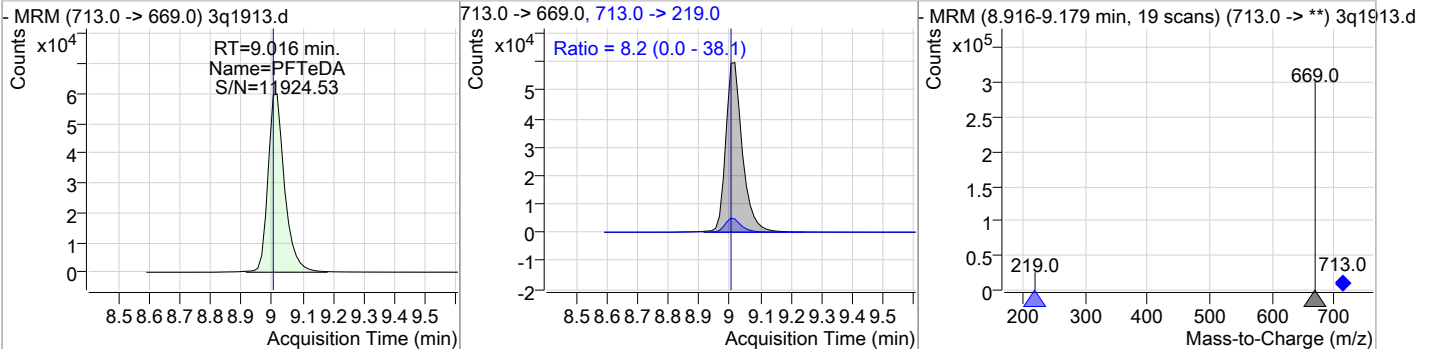
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	15.79	8.41	0.00	147582	613.0 -> 319.0	15.2	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	19.40	8.72	0.00	198908	663.0 -> 369.0	7.9	0.0	37.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	18.41	9.02	0.01	224780	713.0 -> 219.0	8.2	0.0	38.1



Manual Integration Approval Summary

Sample Number: OP74166-BS **Method:** EPA 537 MOD
Lab FileID: 3Q1913.D **Analyst approved:** 03/18/19 11:20 Nancy Saunders
Injection Time: 03/15/19 15:22 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.96	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.3.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1941.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 12:30:11 PM
 Sample Name : op74166-ms
 Vial : P1-D4
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,115,,1.0,25,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	38123	20.00	µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	147818	20.00	µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	165397	20.00	µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	120879	20.00	µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	49981	20.00	µg/L	0.000
d3-MeFOSAA	7.741	573.0 -> 419.0	17552	20.00	µg/L	-0.013
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	0	0.00	µg/L	m 0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C2-PFHxA	4.961	315.0 -> 270.0	0	0.00	µg/L	m 0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
d5-EtFOSAA	7.878	589.0 -> 419.0	0	0.00	µg/L	m -0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%			
Target Compounds						
4:2FTS	4.858	327.0 -> 307.0	1984	0.83	µg/L	QValue 99
6:2FTS	6.601	427.0 -> 407.0	61562	30.83	µg/L	99
8:2FTS	7.707	527.0 -> 507.0	1034	0.82	µg/L	95
EtFOSAA	7.891	584.0 -> 419.0	582	0.71	µg/L	91
FOSA	7.308	498.0 -> 78.0	29043	6.83	µg/L	m 96
MeFOSAA	7.742	570.0 -> 419.0	729	0.73	µg/L	86
PFBA	1.701	213.0 -> 169.0	7659	2.57	µg/L	100
PFBS	3.878	299.0 -> 80.0	9038	2.99	µg/L	98
PFDA	7.684	513.0 -> 469.0	4716	0.75	µg/L	95
PFDoDA	8.408	613.0 -> 569.0	4354	0.61	µg/L	99
PFDS	8.041	599.0 -> 80.0	259	0.60	µg/L	94
PFHpA	5.902	363.0 -> 319.0	49474	3.98	µg/L	100
PFHpS	6.621	449.0 -> 80.0	6349	3.19	µg/L	m 97
PFHxA	4.962	313.0 -> 269.0	46242	10.34	µg/L	99
PFHxS	5.944	399.0 -> 80.0	45700	20.29	µg/L	m 97
PFNA	7.208	463.0 -> 419.0	6766	0.86	µg/L	99
PFNS	7.655	549.0 -> 80.0	1273	0.76	µg/L	93
PFOA	6.618	413.0 -> 369.0	45378	6.20	µg/L	m 96
PFOS	7.192	499.0 -> 80.0	188048	61.93	µg/L	m 78
PFPeA	3.562	263.0 -> 219.0	83073	9.78	µg/L	100
PFPeS	5.093	349.0 -> 80.0	5830	3.43	µg/L	m 94
PFTeDA	9.016	713.0 -> 669.0	5615	0.61	µg/L	99
PFTrDA	8.719	663.0 -> 619.0	4709	0.61	µg/L	97
PFUnDA	8.071	563.0 -> 519.0	5139	0.80	µg/L	99
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.4.1
7



Perfluorinated Compounds by LC/MS/MS

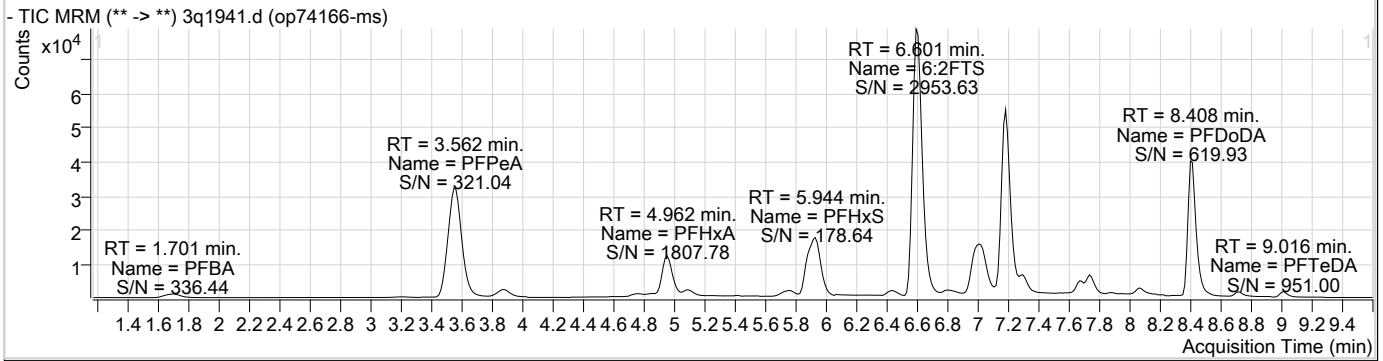
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

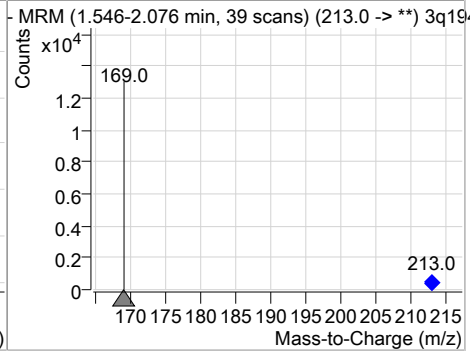
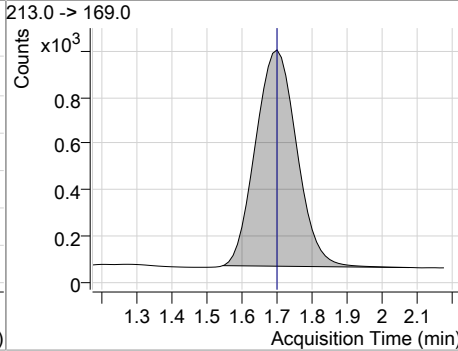
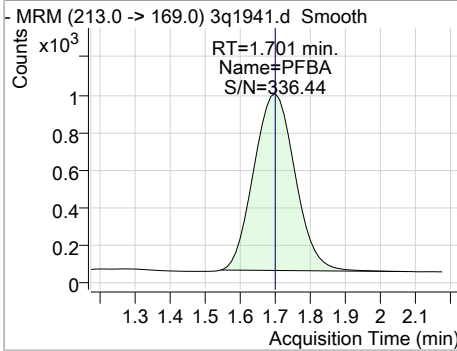
7.4.1

7

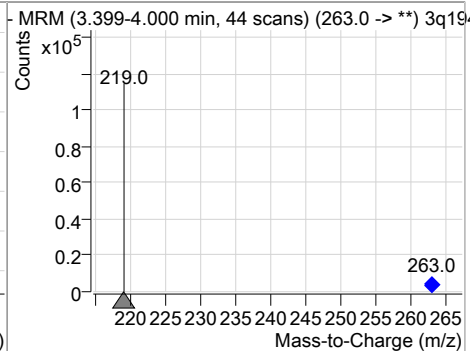
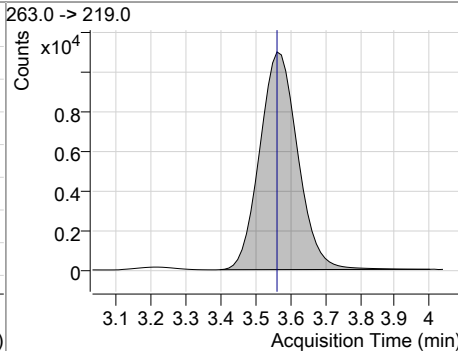
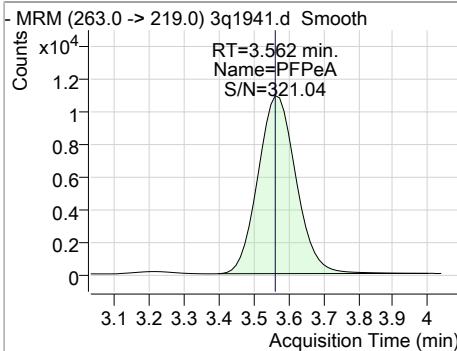
Perfluorinated Compounds by LC/MS/MS



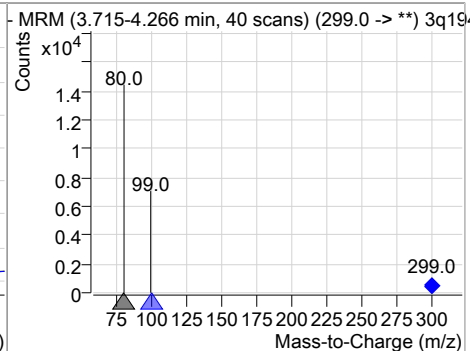
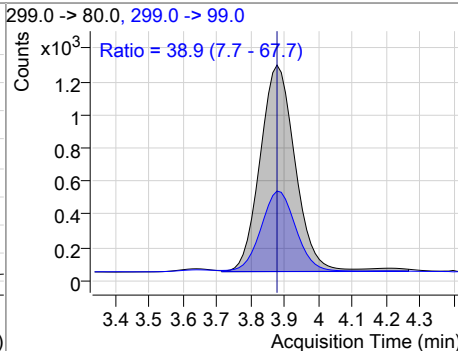
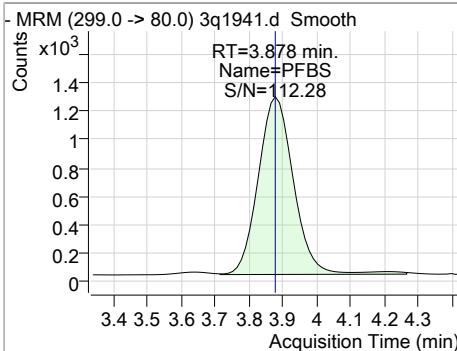
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	2.57	1.70	0.00	7659				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	9.78	3.56	0.00	83073				

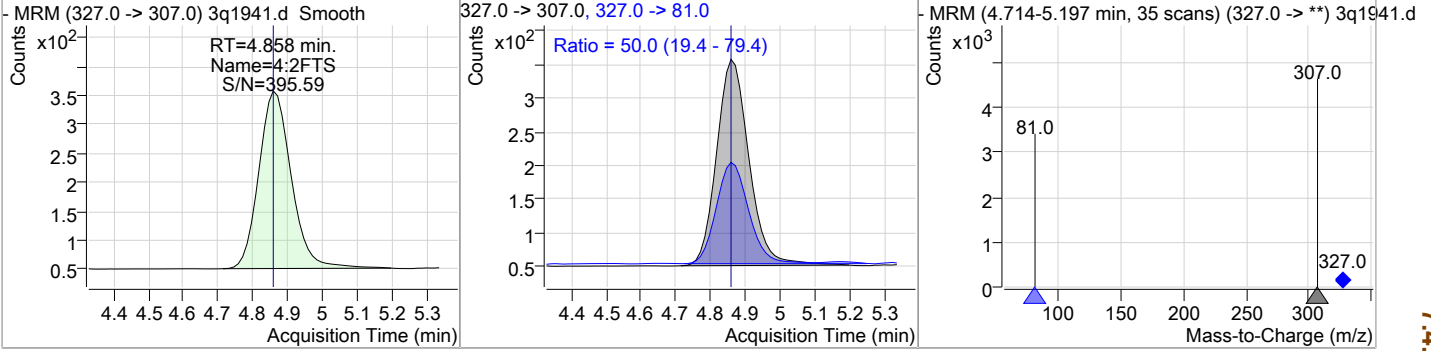


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	2.99	3.88	0.00	9038	299.0 -> 99.0	38.9	7.7	67.7

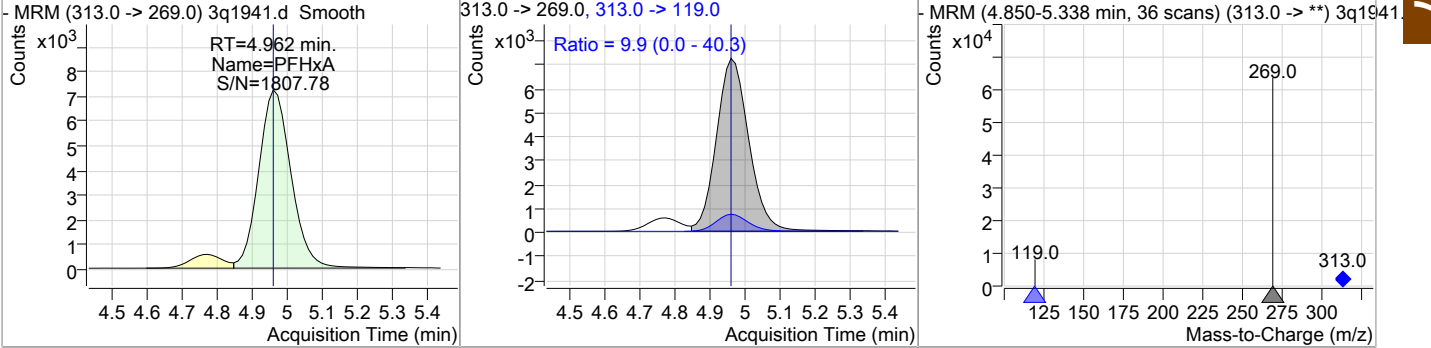


Perfluorinated Compounds by LC/MS/MS

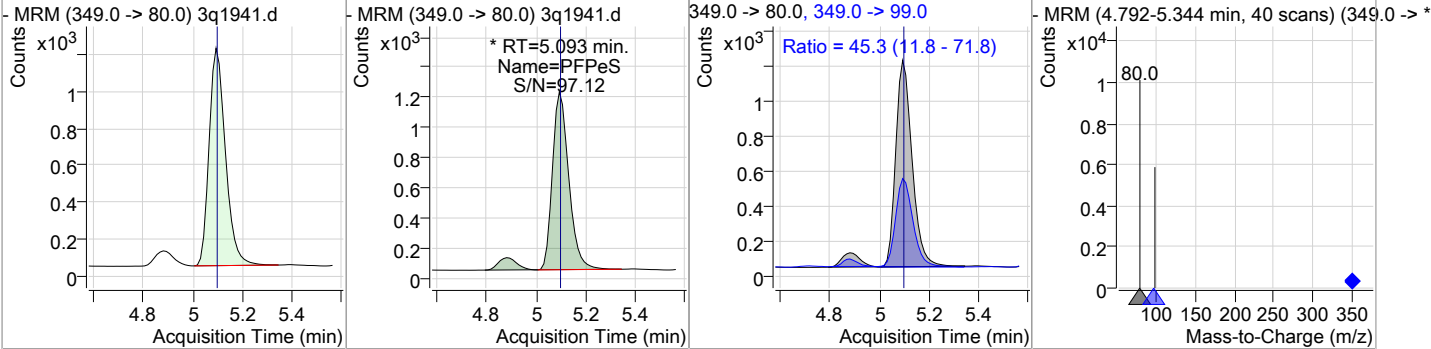
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	0.83	4.86	0.00	1984	327.0 -> 81.0	50.0	19.4	79.4



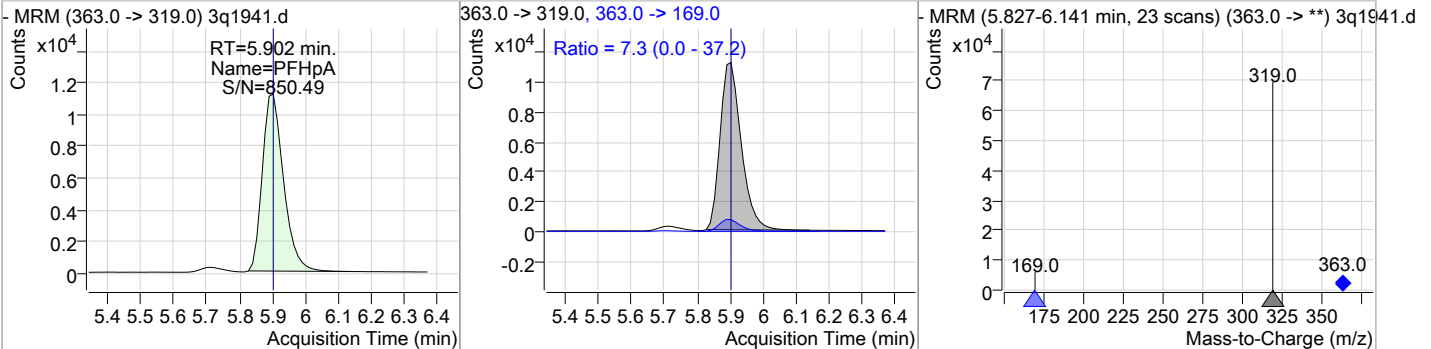
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	10.34	4.96	0.00	46242	313.0 -> 119.0	9.9	0.0	40.3



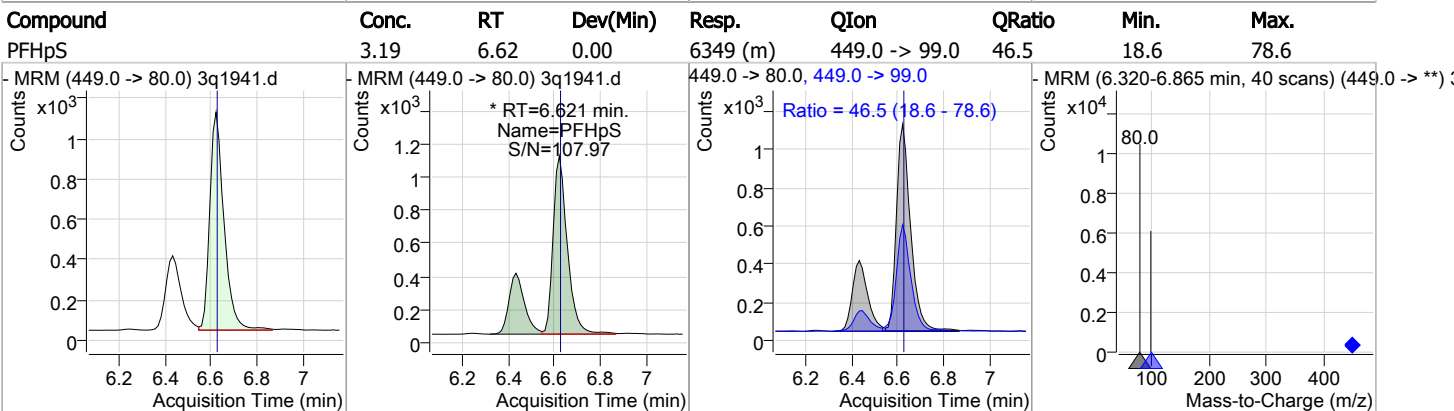
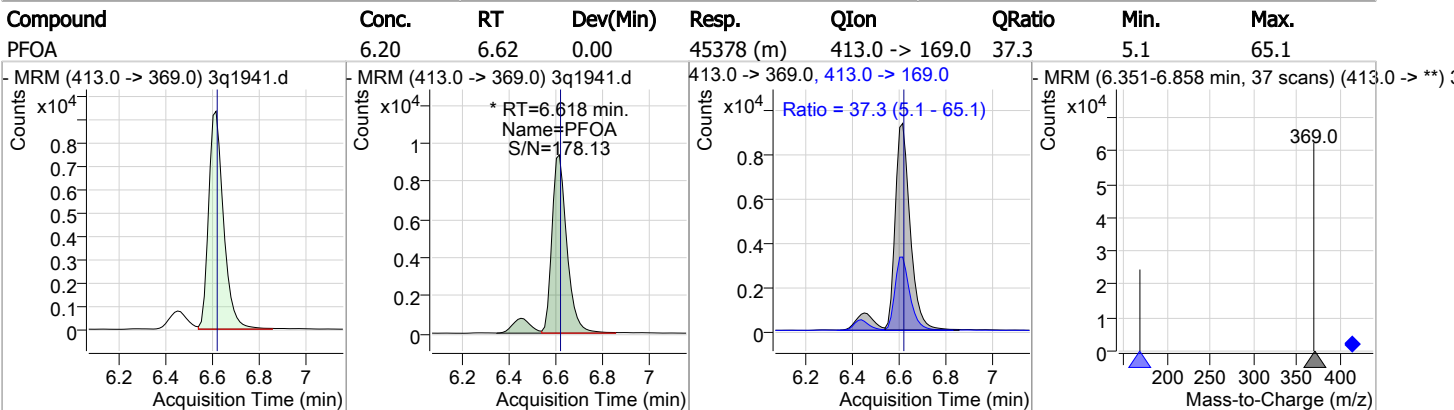
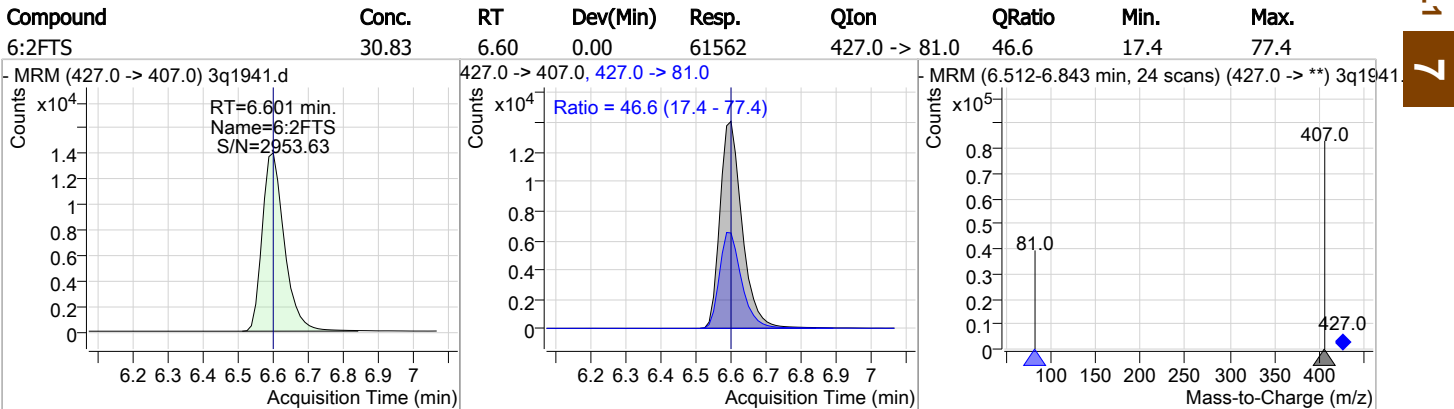
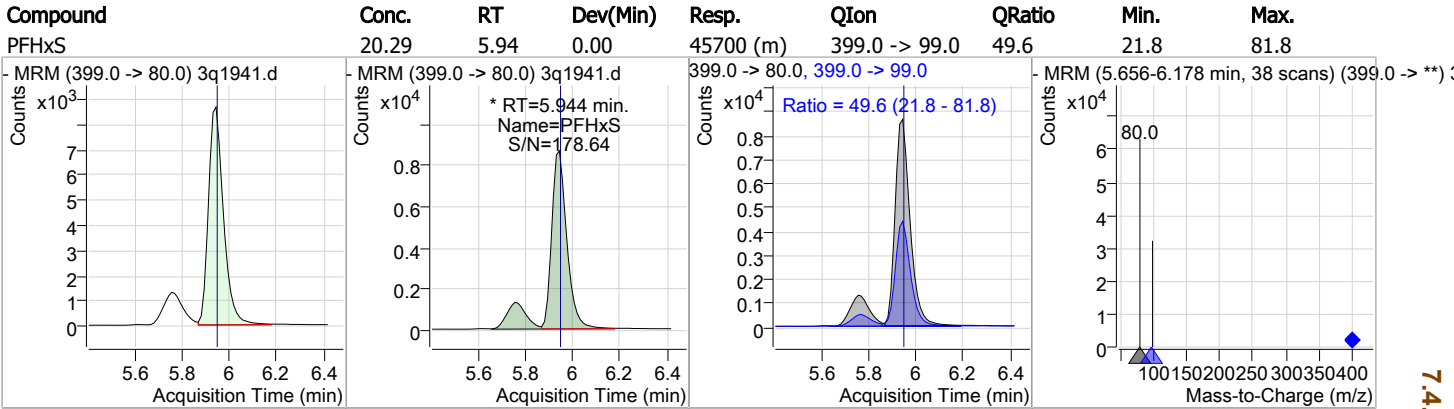
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	3.43	5.09	0.00	5830 (m)	349.0 -> 99.0	45.3	11.8	71.8



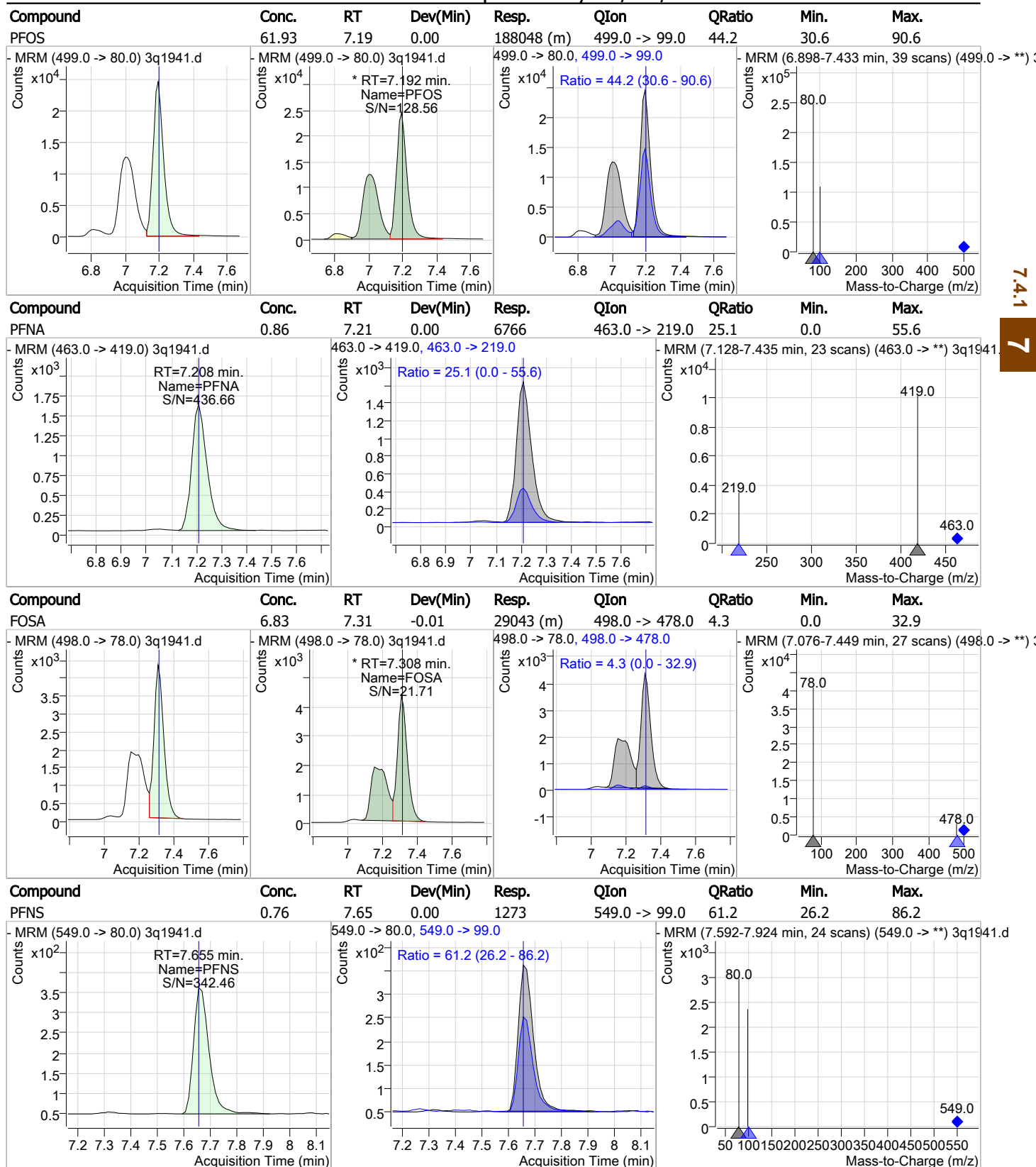
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	3.98	5.90	0.00	49474	363.0 -> 169.0	7.3	0.0	37.2



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

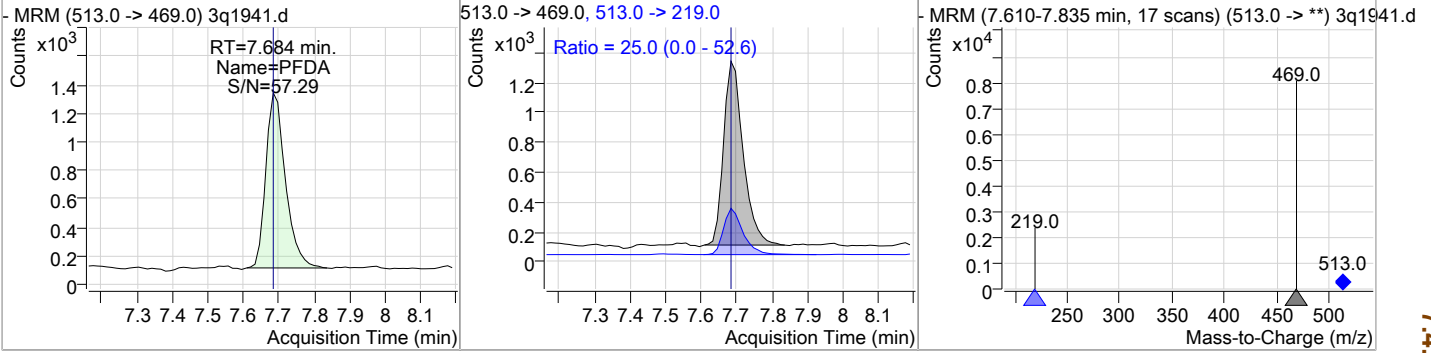


7.4.1
7

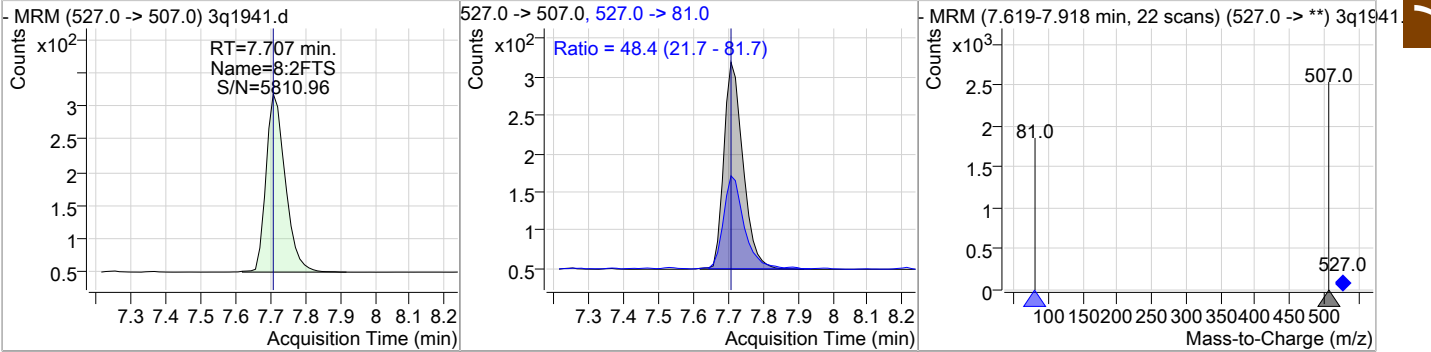


Perfluorinated Compounds by LC/MS/MS

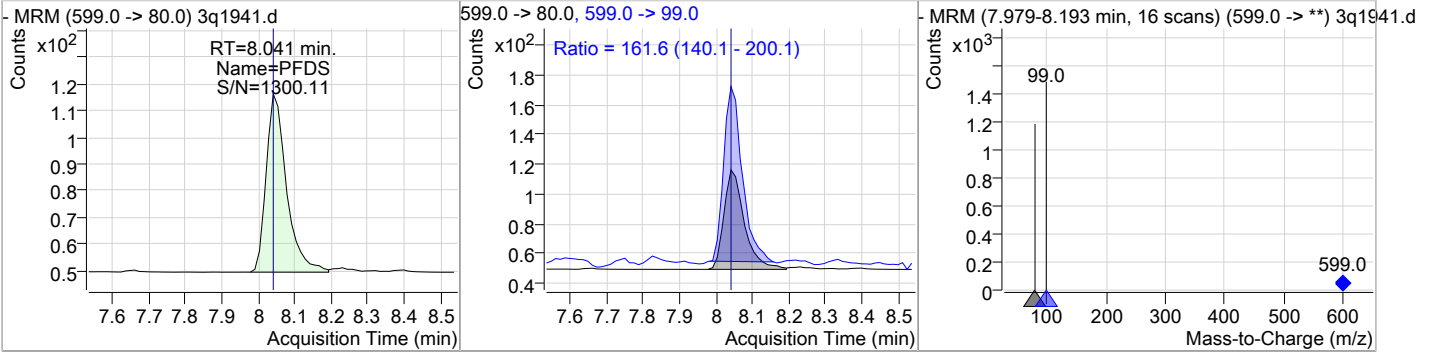
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	0.75	7.68	0.00	4716	513.0 -> 219.0	25.0	0.0	52.6



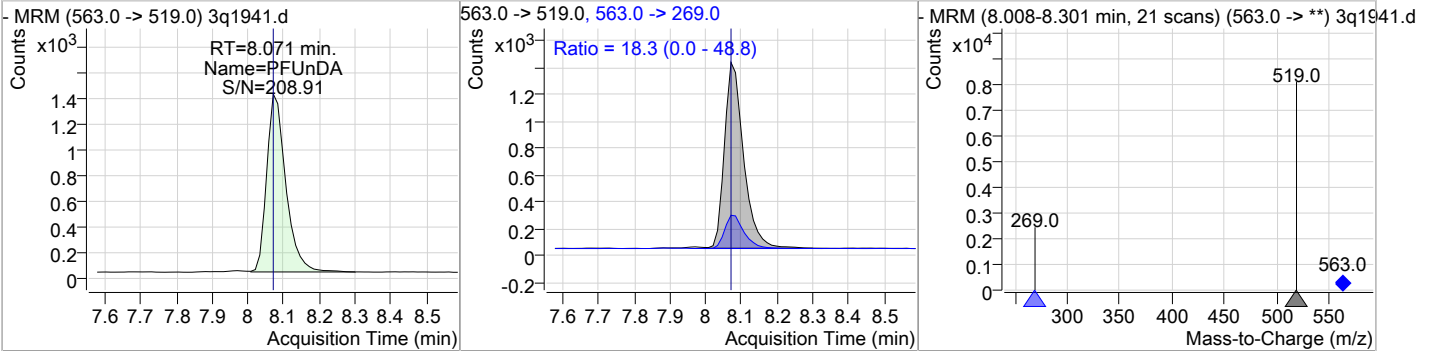
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	0.82	7.71	0.00	1034	527.0 -> 81.0	48.4	21.7	81.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	0.60	8.04	0.00	259	599.0 -> 99.0	161.6	140.1	200.1

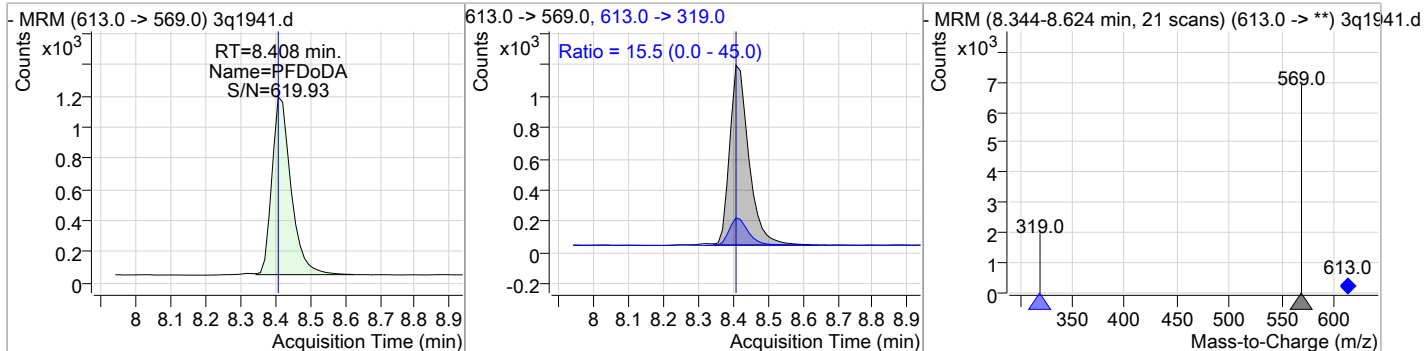


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	0.80	8.07	0.00	5139	563.0 -> 269.0	18.3	0.0	48.8

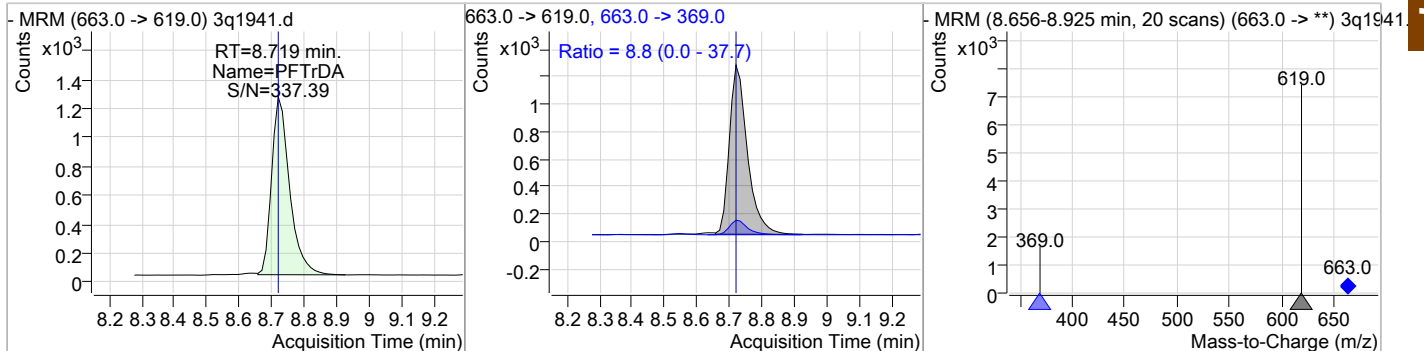


Perfluorinated Compounds by LC/MS/MS

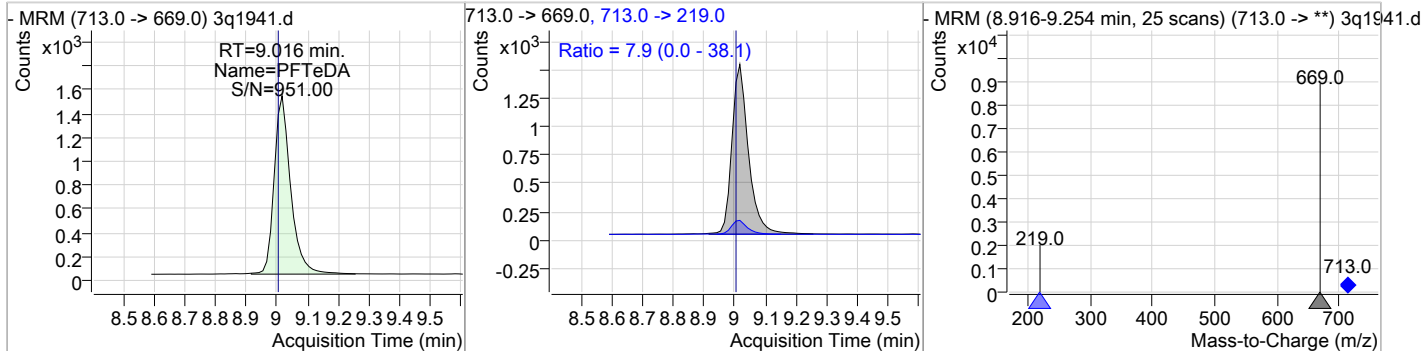
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	0.61	8.41	0.00	4354	613.0 -> 319.0	15.5	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	0.61	8.72	0.00	4709	663.0 -> 369.0	8.8	0.0	37.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	0.61	9.02	0.01	5615	713.0 -> 219.0	7.9	0.0	38.1



Manual Integration Approval Summary

Sample Number: OP74166-MS **Method:** EPA 537 MOD
Lab FileID: 3Q1941.D **Analyst approved:** 03/18/19 15:25 Nancy Saunders
Injection Time: 03/18/19 12:30 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.09	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanoic acid	335-67-1		6.62	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
PFOSA	754-91-6		7.31	Split peak

7.4.1.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1947.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 2:05:36 PM
 Sample Name : op74166-dup
 Vial : P1-E1
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74166,S3Q53,115,,1.0,25,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)	QValue
Internal Standards							
13C2-6:2FTS	6.599	429.0 -> 409.0	39027	20.00	µg/L	0.000	
13C2-PFDoDA	8.419	615.0 -> 570.0	162325	20.00	µg/L	0.013	
13C2-PFOA	6.616	415.0 -> 370.0	169129	20.00	µg/L	0.000	
13C3-PFPeA	3.559	266.0 -> 222.0	122643	20.00	µg/L	0.000	
13C4-PFOS	7.191	503.0 -> 80.0	50284	20.00	µg/L	0.000	
d3-MeFOSAA	7.754	573.0 -> 419.0	18979	20.00	µg/L	0.000	
System Monitoring Compounds							
13C2-PFDA	7.683	515.0 -> 470.0	0	0.00	µg/L	m	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%				
13C2-PFHxA	4.961	315.0 -> 270.0	0	0.00	µg/L	m	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%				
d5-EtFOSAA	7.878	589.0 -> 419.0	0	0.00	µg/L	m	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%				
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.			
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%				
Target Compounds							
4:2FTS	-	327.0 -> 307.0	-	N.D.			
6:2FTS	6.601	427.0 -> 407.0	60031	29.36	µg/L		99
8:2FTS	-	527.0 -> 507.0	-	N.D.			
EtFOSAA	-	584.0 -> 419.0	-	N.D.			
FOSA	7.308	498.0 -> 78.0	28582	6.21	µg/L	m	96
MeFOSAA	-	570.0 -> 419.0	-	N.D.			
PFBA	1.689	213.0 -> 169.0	5899	1.94	µg/L		100
PFBS	3.866	299.0 -> 80.0	6908	2.27	µg/L		96
PFDA	-	513.0 -> 469.0	-	N.D.			
PFDoDA	-	613.0 -> 569.0	-	N.D.			
PFDS	-	599.0 -> 80.0	-	N.D.			
PFHpA	5.902	363.0 -> 319.0	43687	3.44	µg/L	m	100
PFHpS	6.621	449.0 -> 80.0	4931	2.46	µg/L	m	91
PFHxA	4.962	313.0 -> 269.0	42996	9.40	µg/L		99
PFHxS	5.944	399.0 -> 80.0	44731	19.74	µg/L	m	97
PFNA	-	463.0 -> 419.0	-	N.D.			
PFNS	-	549.0 -> 80.0	-	N.D.			
PFOA	6.618	413.0 -> 369.0	41948	5.61	µg/L	m	98
PFOS	7.192	499.0 -> 80.0	178581	58.46	µg/L	m	79
PFPeA	3.562	263.0 -> 219.0	77478	8.99	µg/L		100
PFPeS	5.093	349.0 -> 80.0	4598	2.67	µg/L	m	88
PFTeDA	-	713.0 -> 669.0	-	N.D.			
PFTrDA	-	663.0 -> 619.0	-	N.D.			
PFUnDA	-	563.0 -> 519.0	-	N.D.			
ADONA	-	377.0 -> 251.0	-	N.D.			
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.			
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.			
HFPO-DA	-	329.0 -> 169.0	-	N.D.			

7.5.1
7

Perfluorinated Compounds by LC/MS/MS

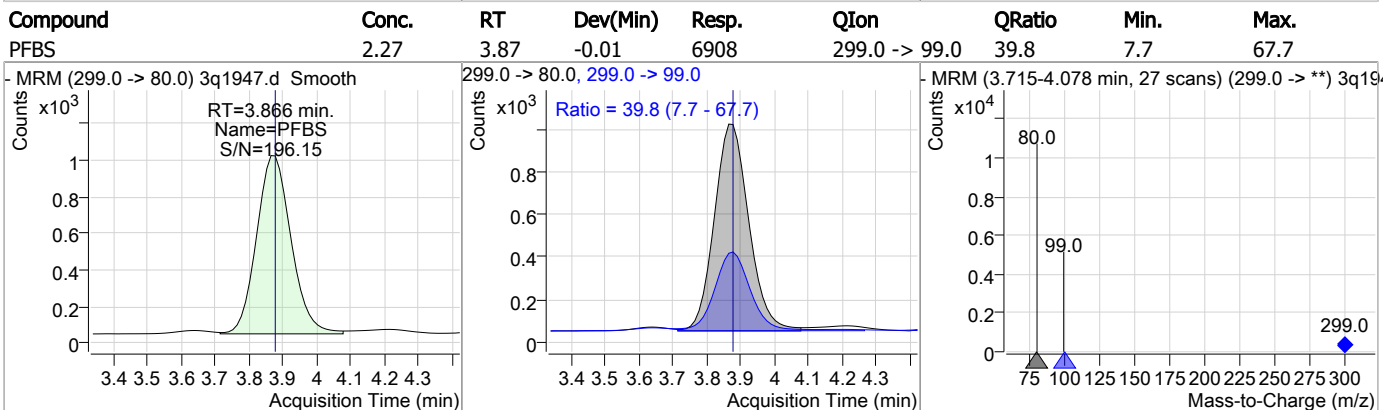
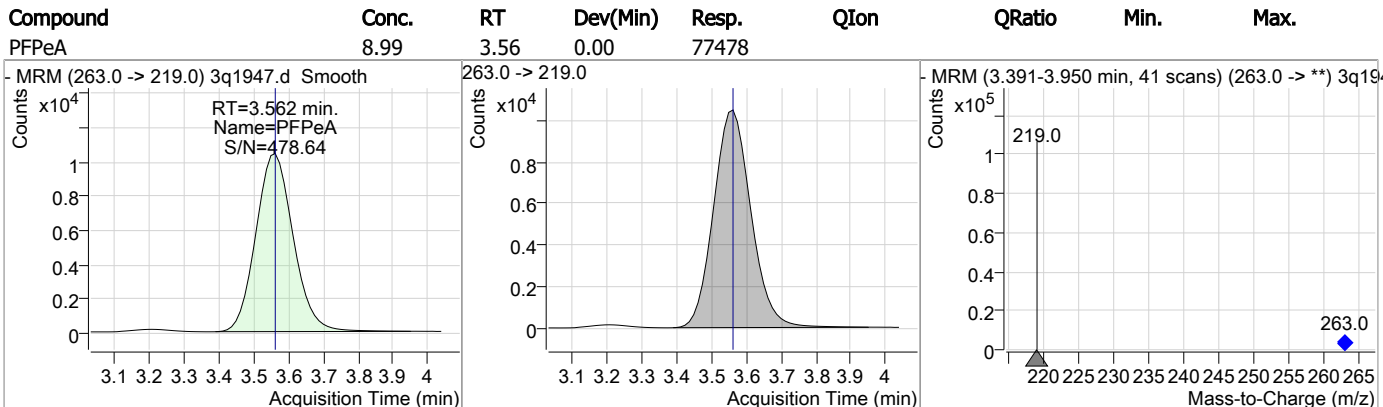
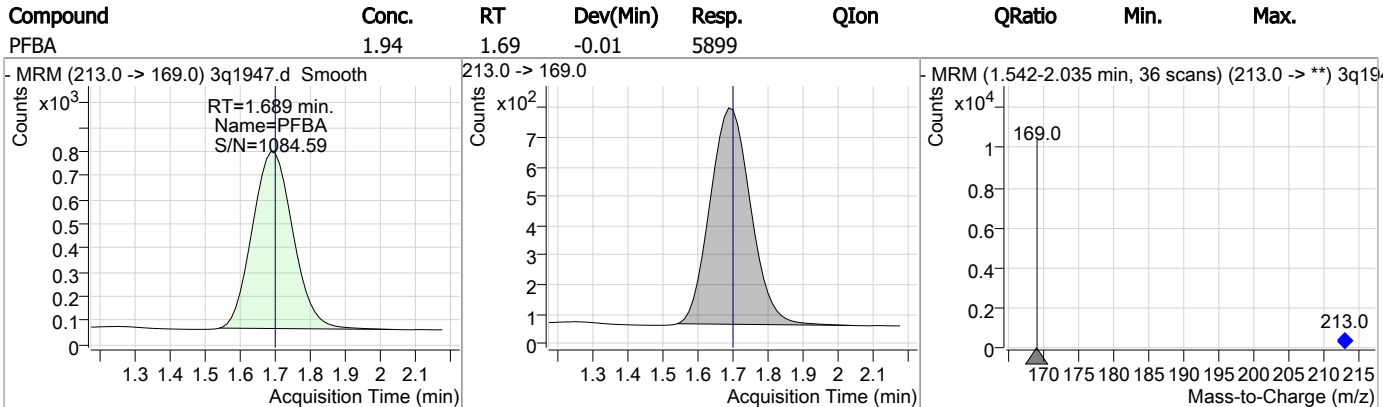
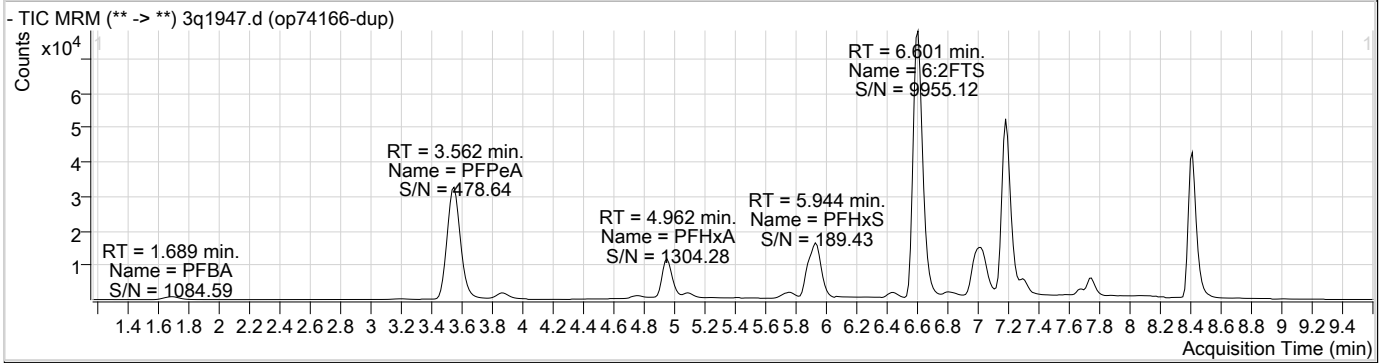
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.5.1

7

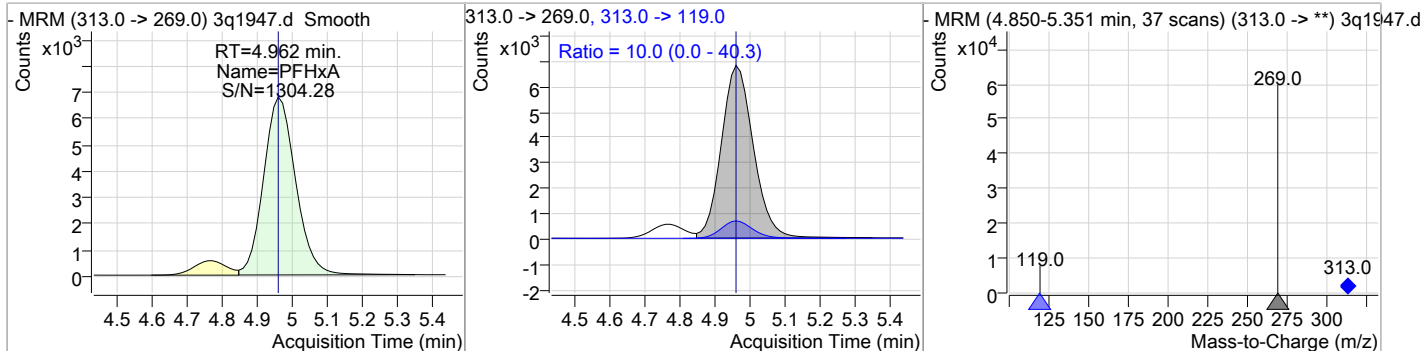
Perfluorinated Compounds by LC/MS/MS



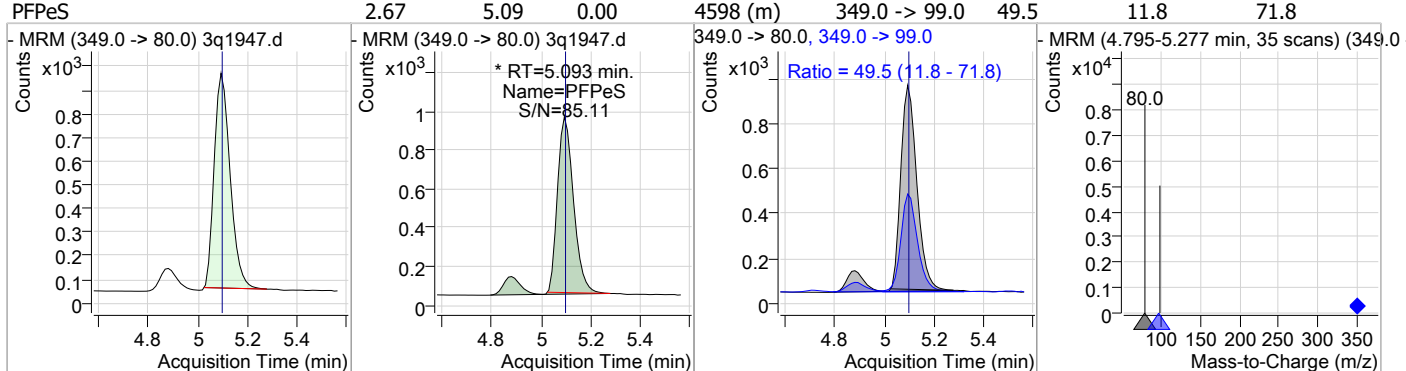
7.5.1
7

Perfluorinated Compounds by LC/MS/MS

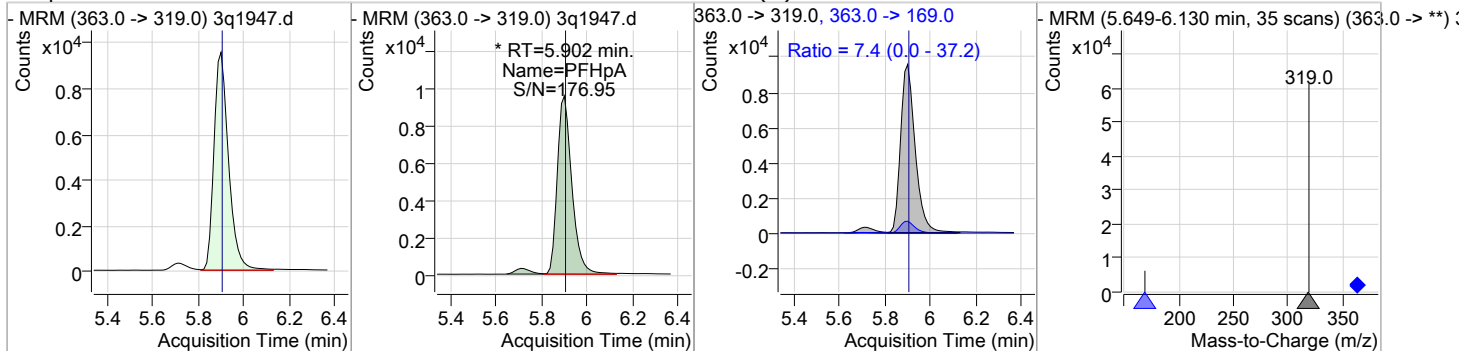
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	9.40	4.96	0.00	42996	313.0 -> 119.0	10.0	0.0	40.3



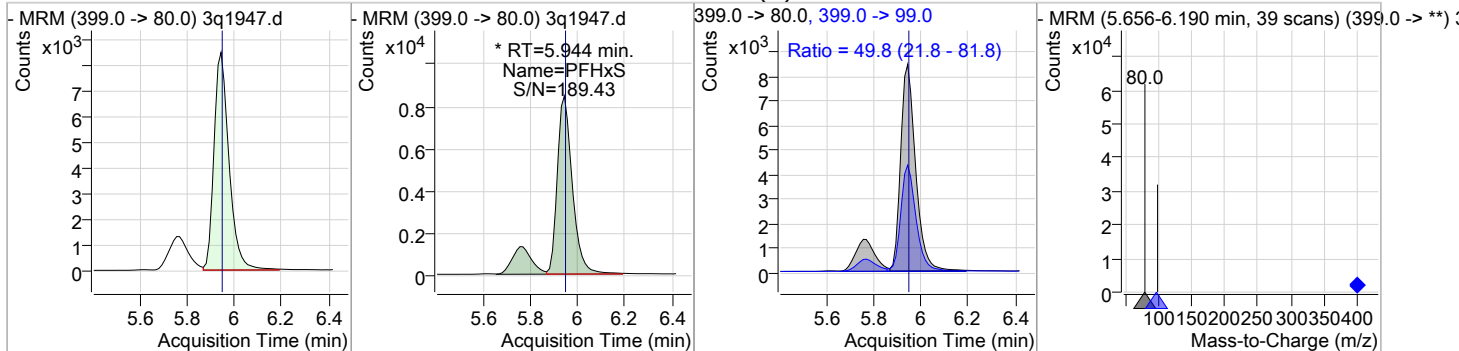
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	2.67	5.09	0.00	4598 (m)	349.0 -> 99.0	49.5	11.8	71.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	3.44	5.90	0.00	43687 (m)	363.0 -> 169.0	7.4	0.0	37.2

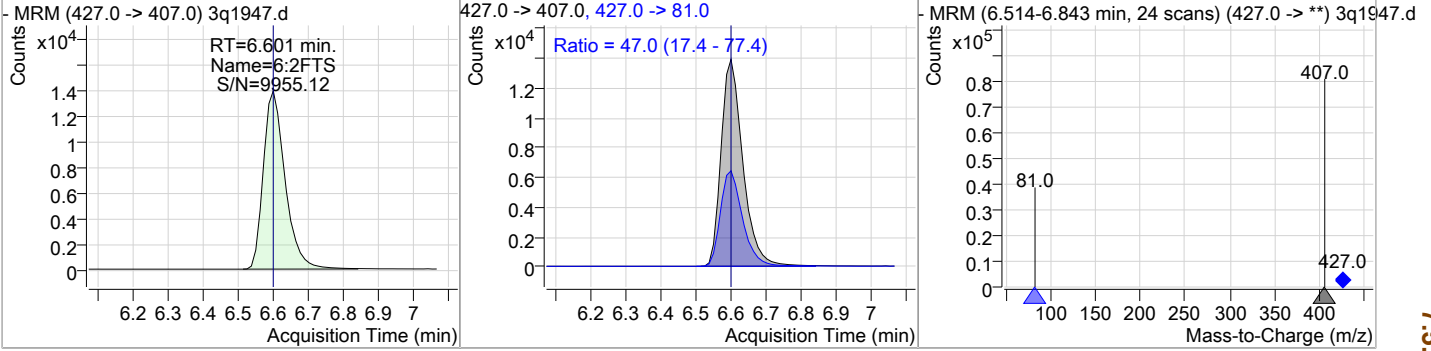


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	19.74	5.94	0.00	44731 (m)	399.0 -> 99.0	49.8	21.8	81.8

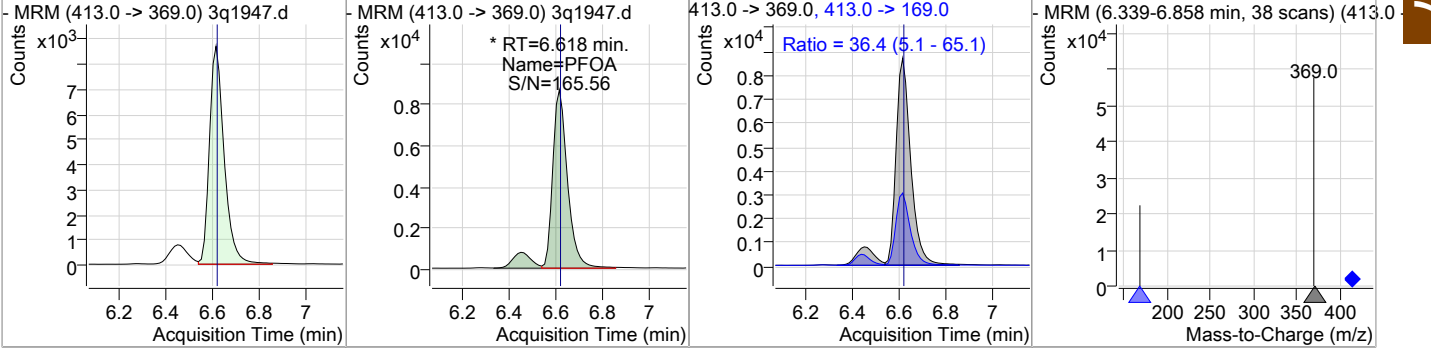


Perfluorinated Compounds by LC/MS/MS

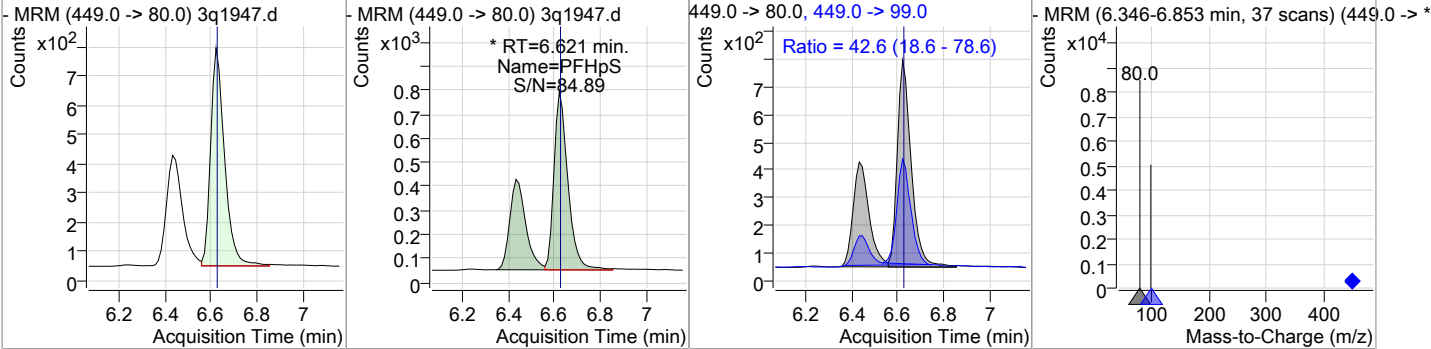
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	29.36	6.60	0.00	60031	427.0 -> 81.0	47.0	17.4	77.4



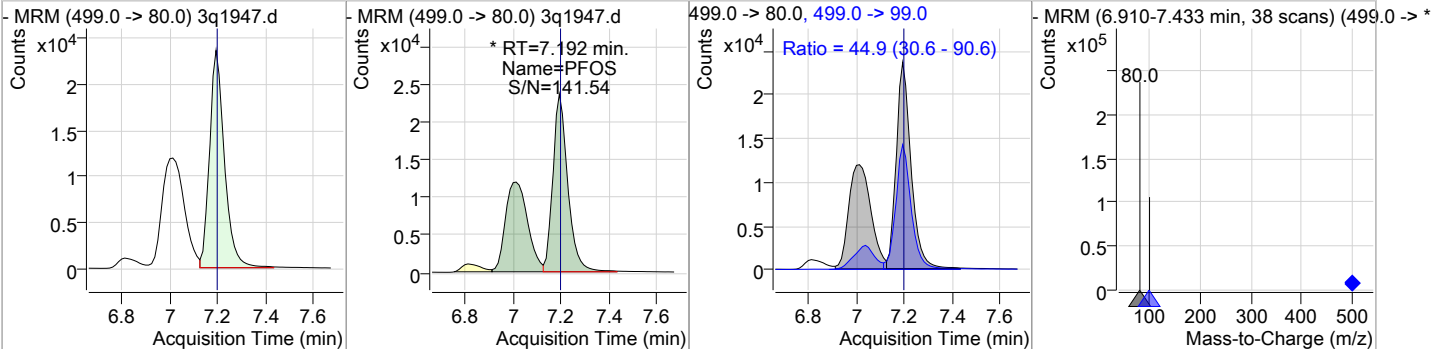
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	5.61	6.62	0.00	41948 (m)	413.0 -> 169.0	36.4	5.1	65.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	2.46	6.62	0.00	4931 (m)	449.0 -> 99.0	42.6	18.6	78.6

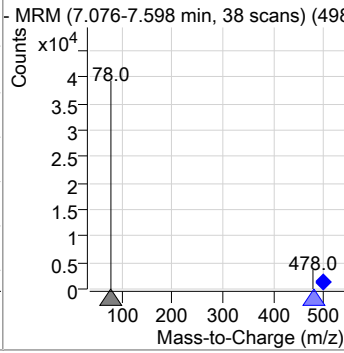
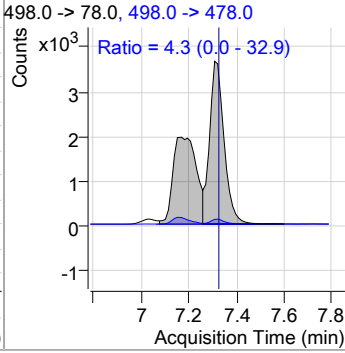
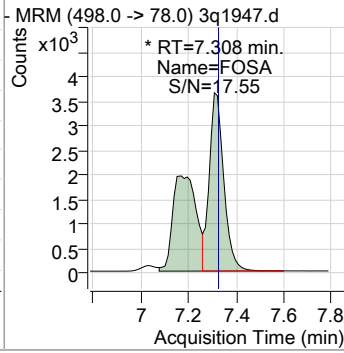
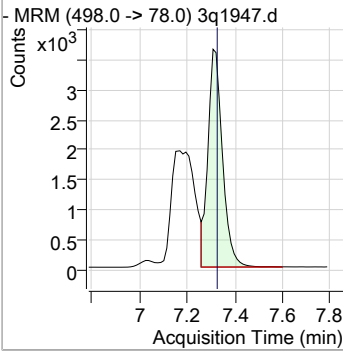


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	58.46	7.19	0.00	178581 (m)	499.0 -> 99.0	44.9	30.6	90.6



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
FOSA	6.21	7.31	-0.01	28582 (m)	498.0 -> 478.0	4.3	0.0	32.9



7.5.1

7

Manual Integration Approval Summary

Sample Number: OP74166-DUP
Lab FileID: 3Q1947.D
Injection Time: 03/18/19 14:05

Method: EPA 537 MOD
Analyst approved: 03/18/19 15:25 Nancy Saunders
Supervisor approved: 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluoropentanesulfonic acid	2706-91-4		5.09	Split peak
Perfluoroheptanoic acid	375-85-9		5.90	Split peak
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanoic acid	335-67-1		6.62	Split peak
Perfluoroheptanesulfonic acid	375-92-8		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
PFOSA	754-91-6		7.31	Split peak

7.5.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1902.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 12:33:15 PM
 Sample Name : IC52-0.5
 Vial : P1-A2
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.574	429.0 -> 409.0	37627	20.00 µg/L	-0.025
13C2-PFDoDA	8.394	615.0 -> 570.0	164578	20.00 µg/L	-0.013
13C2-PFOA	6.591	415.0 -> 370.0	187741	20.00 µg/L	-0.025
13C3-PFPeA	3.546	266.0 -> 222.0	147027	20.00 µg/L	-0.013
13C4-PFOS	7.166	503.0 -> 80.0	58268	20.00 µg/L	-0.025
d3-MeFOSAA	7.729	573.0 -> 419.0	19386	20.00 µg/L	-0.025
System Monitoring Compounds					
13C2-PFDA	7.670	515.0 -> 470.0	4783	0.47 µg/L	-0.014
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 2.4%		
13C2-PFHxA	4.936	315.0 -> 270.0	5155	0.50 µg/L	-0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 2.5%		
d5-EtFOSAA	7.865	589.0 -> 419.0	641	0.57 µg/L	-0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 2.9%		
13C3-HFPO-DA	5.240	287.0 -> 169.0	2133	2.77 µg/L	-0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = 2.8%		
Target Compounds					
4:2FTS	4.846	327.0 -> 307.0	1269	0.54 µg/L	QValue 99
6:2FTS	6.576	427.0 -> 407.0	1175	0.60 µg/L	95
8:2FTS	7.682	527.0 -> 507.0	663	0.53 µg/L	87
EtFOSAA	7.866	584.0 -> 419.0	541	0.60 µg/L	93
FOSA	7.295	498.0 -> 78.0	2485	0.52 µg/L	99
MeFOSAA	7.729	570.0 -> 419.0	688	0.62 µg/L	95
PFBA	1.701	213.0 -> 169.0	1598	0.47 µg/L	100
PFBS	3.866	299.0 -> 80.0	1743	0.50 µg/L	97
PFDA	7.658	513.0 -> 469.0	3545	0.50 µg/L	97
PFDoDA	8.395	613.0 -> 569.0	3943	0.50 µg/L	98
PFDS	8.029	599.0 -> 80.0	240	0.48 µg/L	92
PFHpA	5.877	363.0 -> 319.0	6921	0.49 µg/L	100
PFHpS	6.596	449.0 -> 80.0	1172	0.51 µg/L	87
PFHxA	4.950	313.0 -> 269.0	2417	0.48 µg/L	98
PFHxS	5.919	399.0 -> 80.0	1362	0.52 µg/L	m 99
PFNA	7.183	463.0 -> 419.0	4208	0.47 µg/L	96
PFNS	7.642	549.0 -> 80.0	1045	0.53 µg/L	94
PFOA	6.593	413.0 -> 369.0	4069	0.49 µg/L	97
PFOS	7.167	499.0 -> 80.0	1733	0.49 µg/L	m 91
PFPeA	3.550	263.0 -> 219.0	5261	0.51 µg/L	100
PFPeS	5.068	349.0 -> 80.0	1127	0.54 µg/L	94
PFTeDA	8.991	713.0 -> 669.0	5289	0.51 µg/L	99
PFTrDA	8.707	663.0 -> 619.0	4538	0.52 µg/L	99
PFUnDA	8.059	563.0 -> 519.0	3852	0.54 µg/L	95
ADONA	5.974	377.0 -> 251.0	9404	0.47 µg/L	100
9Cl-PF3ONS	7.429	531.0 -> 351.0	935	0.47 µg/L	100
11Cl-PF3OUdS	8.190	631.0 -> 451.0	3801	0.49 µg/L	100
HFPO-DA	5.245	329.0 -> 169.0	6404	2.59 µg/L	98

7.6.1
7

Perfluorinated Compounds by LC/MS/MS

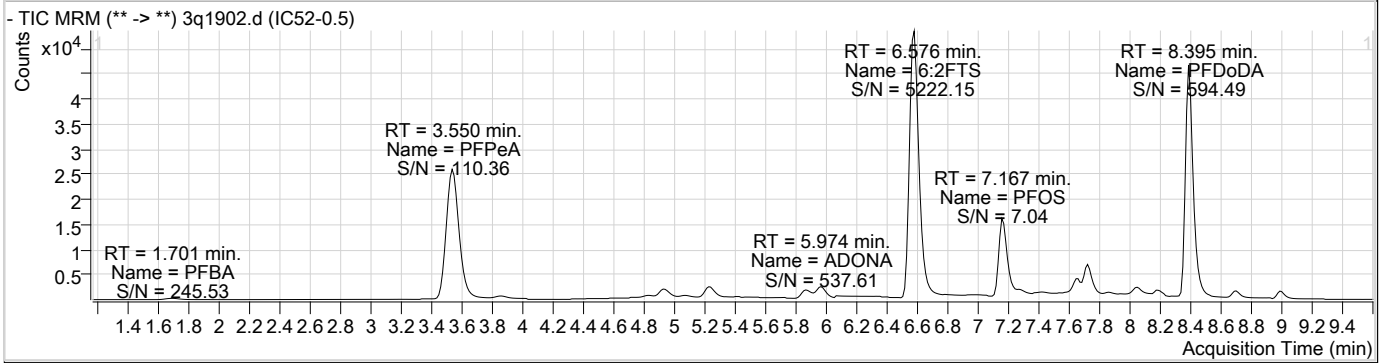
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

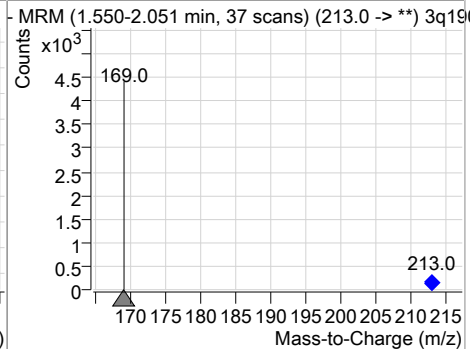
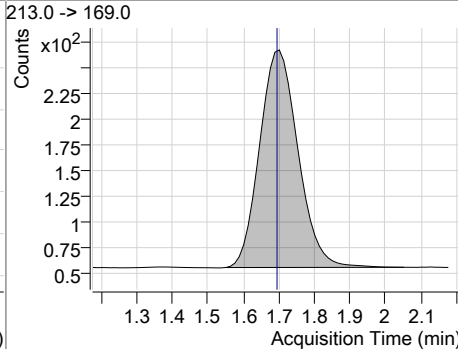
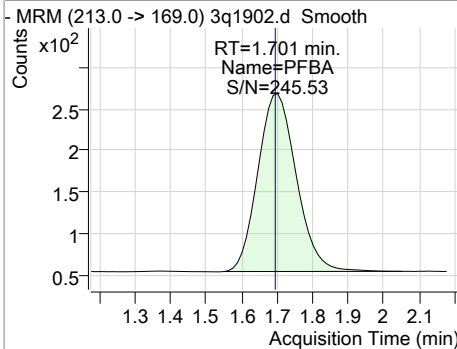
7.6.1

7

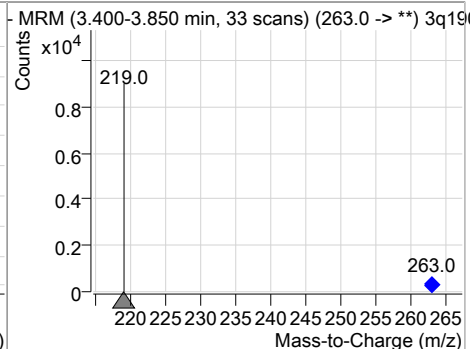
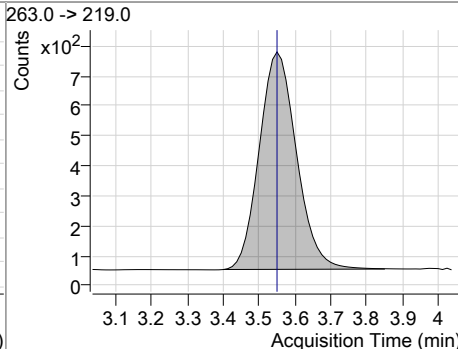
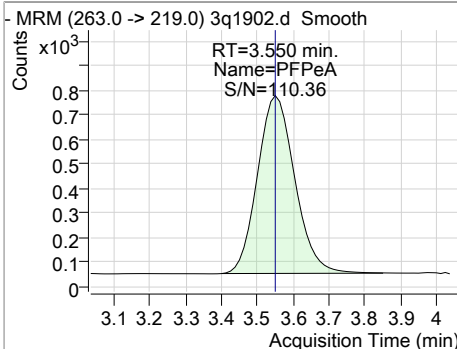
Perfluorinated Compounds by LC/MS/MS



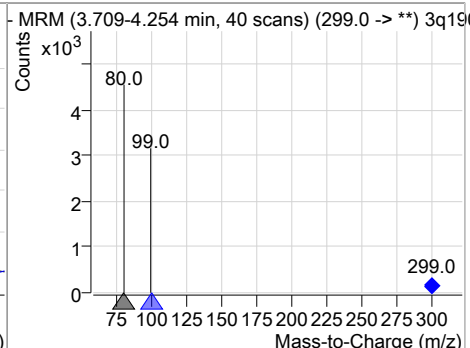
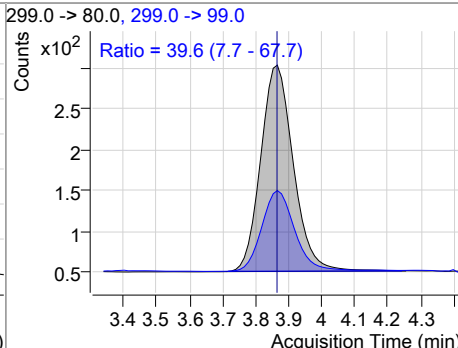
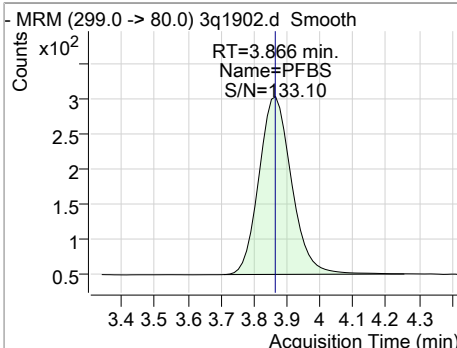
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.47	1.70	0.00	1598				



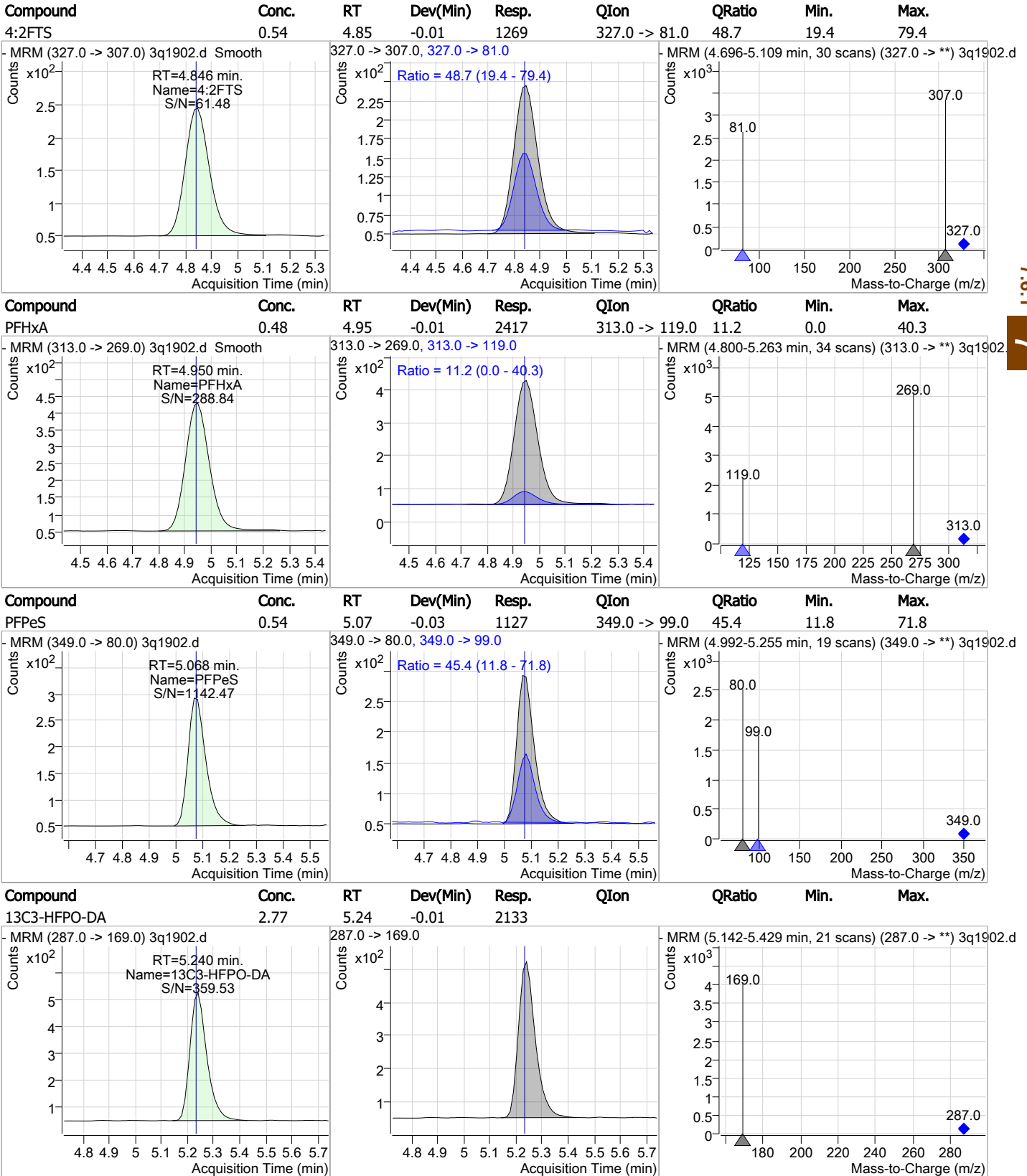
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	0.51	3.55	-0.01	5261				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	0.50	3.87	-0.01	1743	299.0 -> 99.0	39.6	7.7	67.7

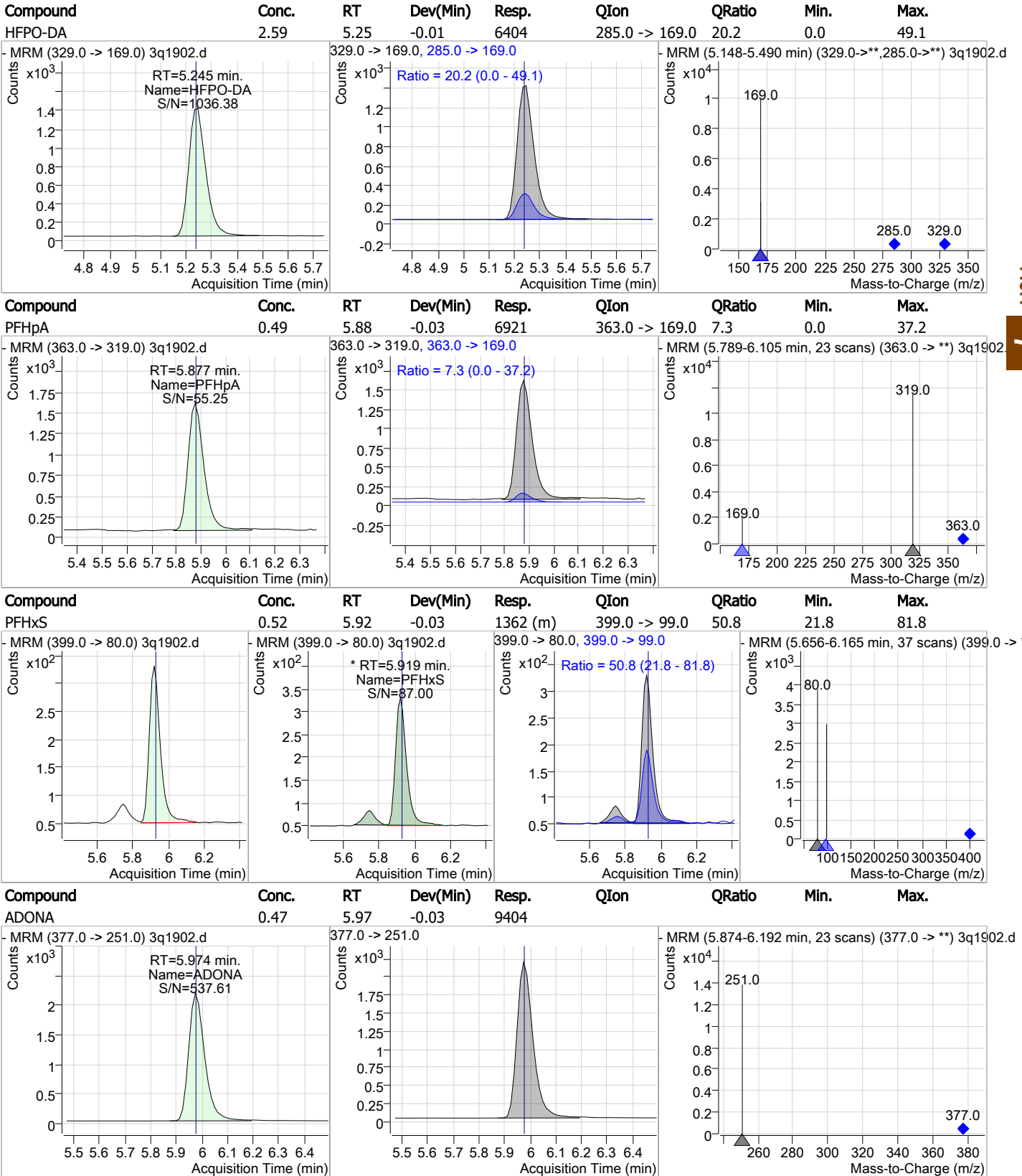


Perfluorinated Compounds by LC/MS/MS



7.6.1

Perfluorinated Compounds by LC/MS/MS



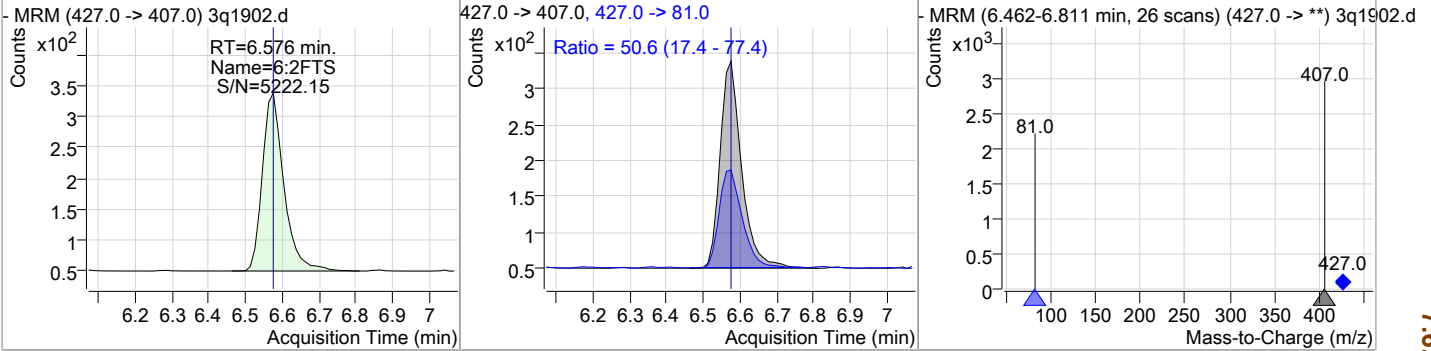
7.6.1

7

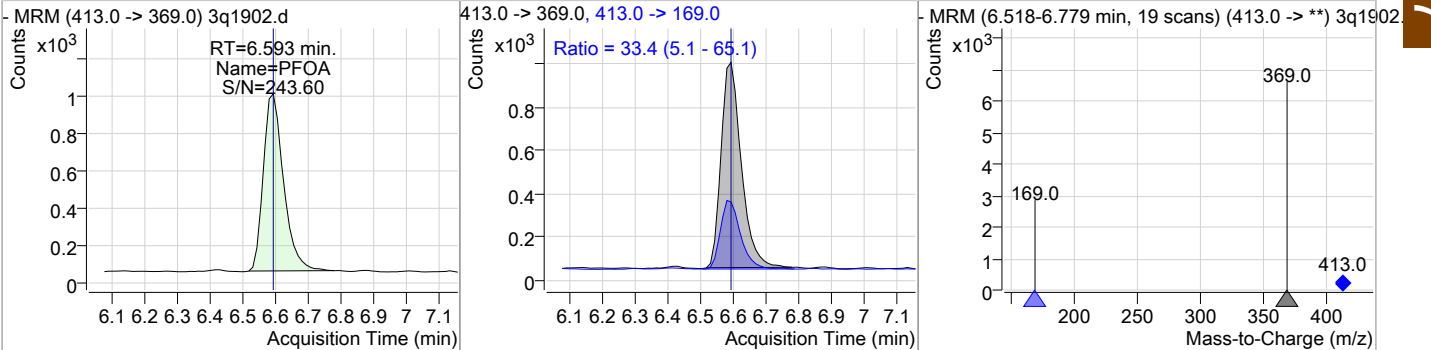


Perfluorinated Compounds by LC/MS/MS

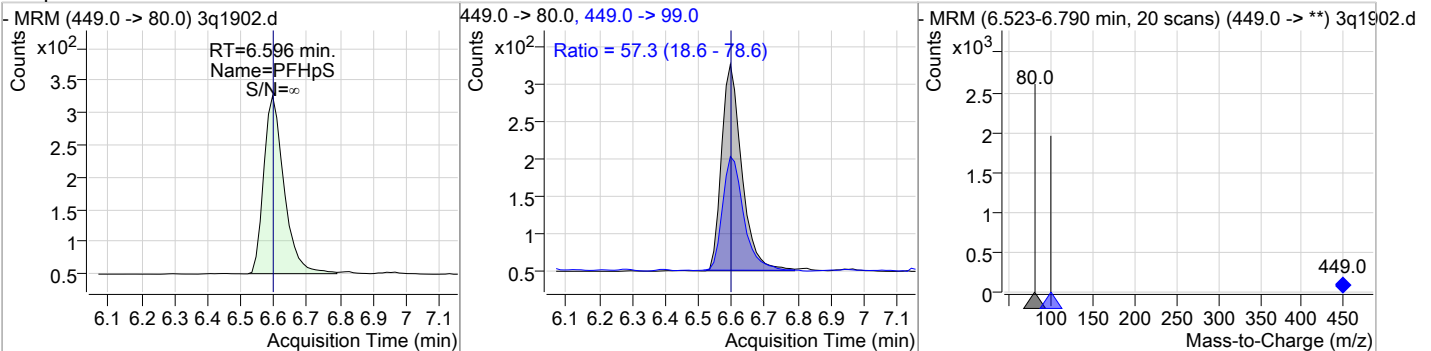
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	0.60	6.58	-0.03	1175	427.0 -> 81.0	50.6	17.4	77.4



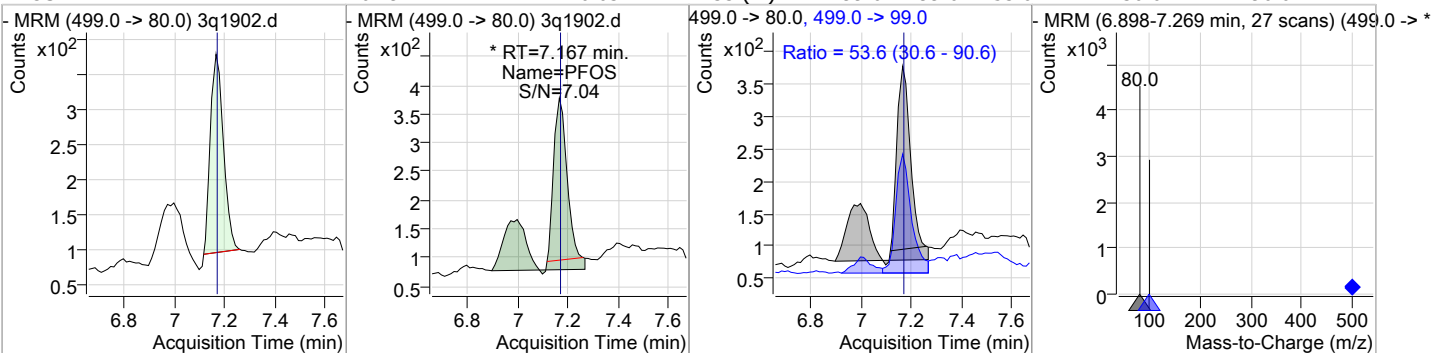
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	0.49	6.59	-0.03	4069	413.0 -> 169.0	33.4	5.1	65.1



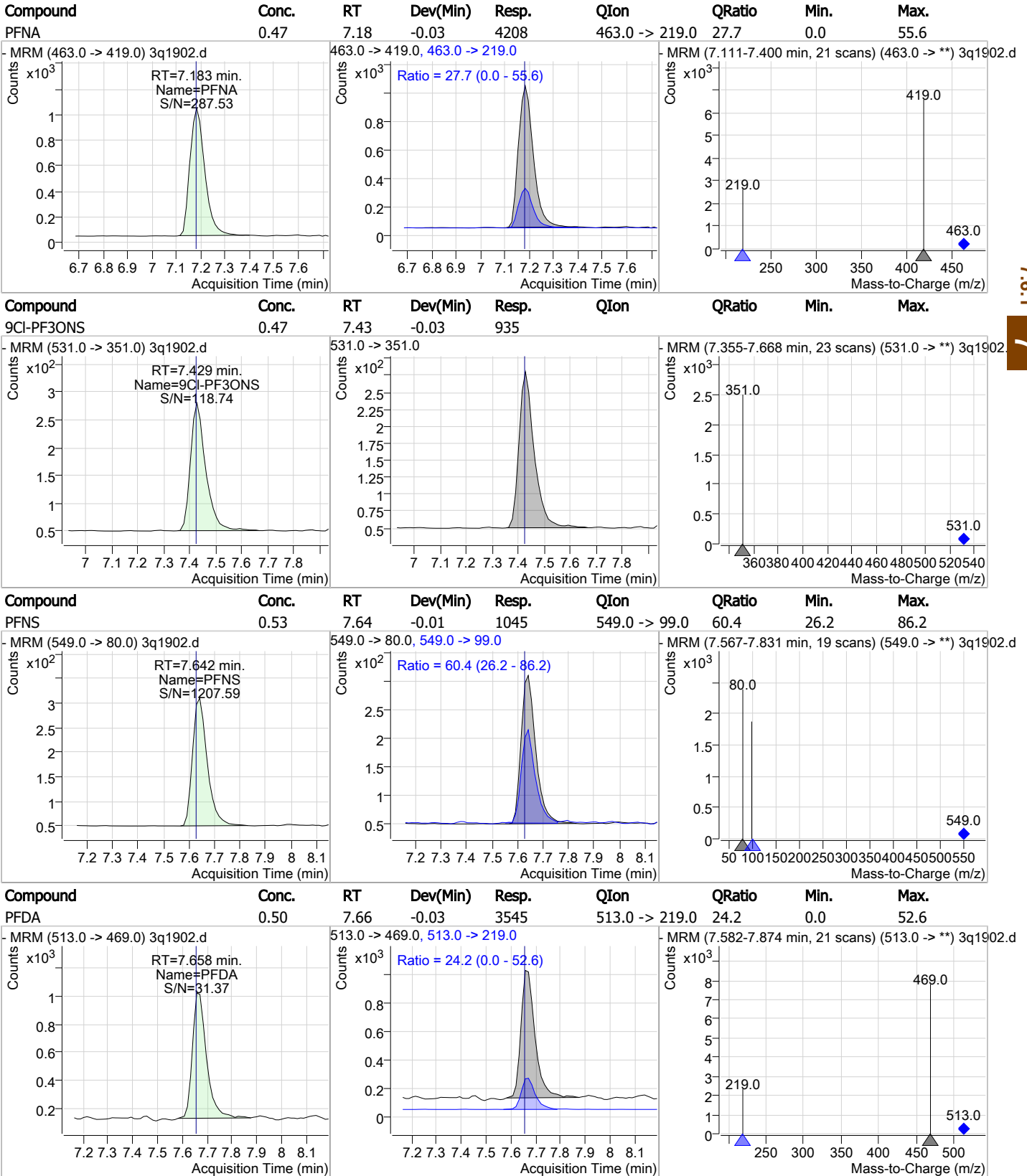
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	0.51	6.60	-0.03	1172	449.0 -> 99.0	57.3	18.6	78.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	0.49	7.17	-0.03	1733 (m)	499.0 -> 99.0	53.6	30.6	90.6



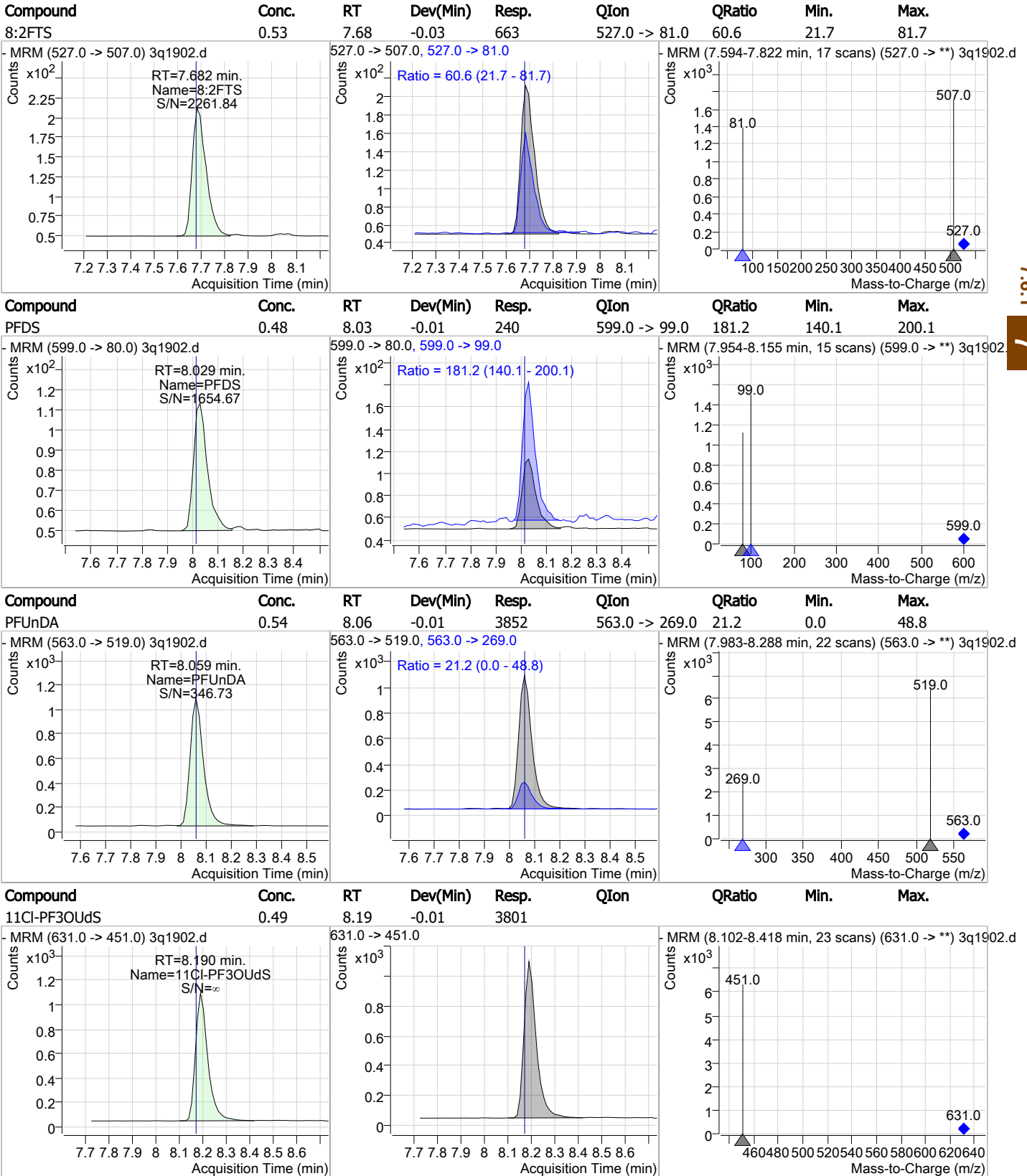
Perfluorinated Compounds by LC/MS/MS



7.6.1

7

Perfluorinated Compounds by LC/MS/MS

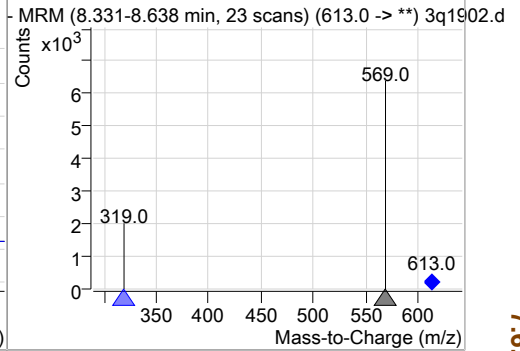
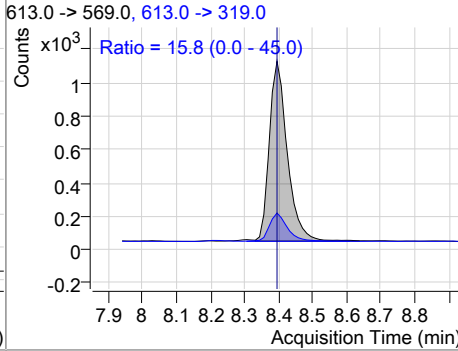
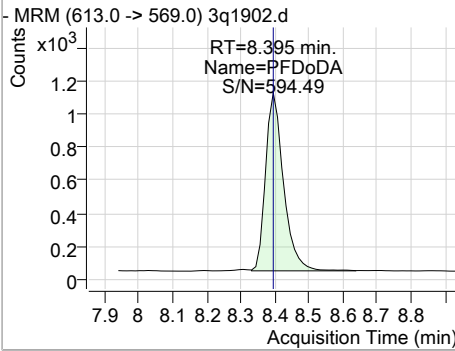


7.6.1

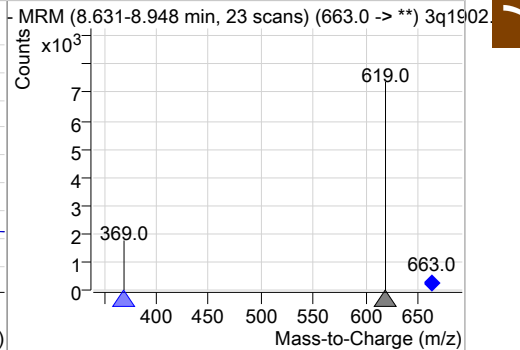
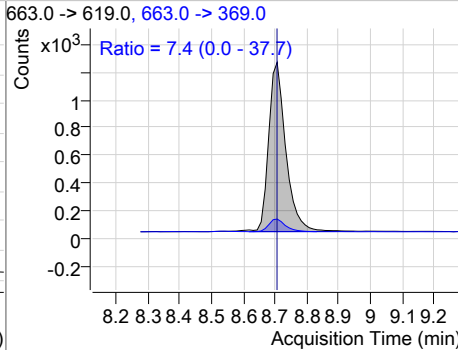
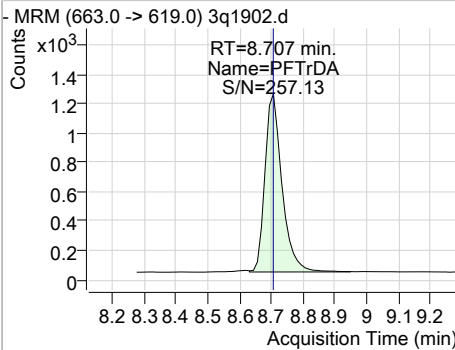


Perfluorinated Compounds by LC/MS/MS

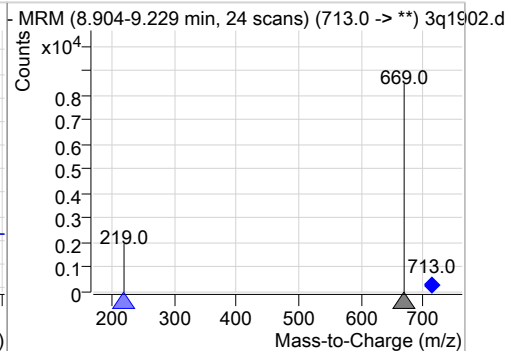
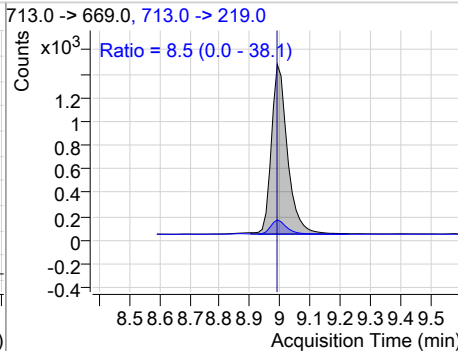
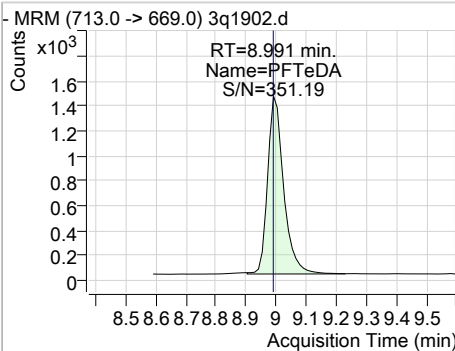
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	0.50	8.40	-0.01	3943	613.0 -> 319.0	15.8	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	0.52	8.71	-0.01	4538	663.0 -> 369.0	7.4	0.0	37.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	0.51	8.99	-0.01	5289	713.0 -> 219.0	8.5	0.0	38.1



7.6.1
7



Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1902.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 12:33 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.92	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.17	Split peak

7.6.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1903.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 12:49:07 PM
 Sample Name : IC52-1.0
 Vial : P1-A3
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.587	429.0 -> 409.0	38958	20.00 µg/L	-0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	170653	20.00 µg/L	0.000
13C2-PFOA	6.604	415.0 -> 370.0	189130	20.00 µg/L	-0.013
13C3-PFPeA	3.546	266.0 -> 222.0	148515	20.00 µg/L	-0.013
13C4-PFOS	7.179	503.0 -> 80.0	61524	20.00 µg/L	-0.013
d3-MeFOSAA	7.741	573.0 -> 419.0	20982	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.684	515.0 -> 470.0	9939	0.97 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 4.9%		
13C2-PFHxA	4.949	315.0 -> 270.0	9792	0.95 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 4.7%		
d5-EtFOSAA	7.878	589.0 -> 419.0	1179	0.97 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 4.9%		
13C3-HFPO-DA	5.253	287.0 -> 169.0	3962	5.10 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = 5.1%		
Target Compounds					
4:2FTS	4.846	327.0 -> 307.0	2534	1.04 µg/L	QValue 99
6:2FTS	6.588	427.0 -> 407.0	2121	1.04 µg/L	93
8:2FTS	7.707	527.0 -> 507.0	1323	1.03 µg/L	95
EtFOSAA	7.878	584.0 -> 419.0	863	0.88 µg/L	82
FOSA	7.308	498.0 -> 78.0	4687	0.91 µg/L	99
MeFOSAA	7.742	570.0 -> 419.0	1012	0.84 µg/L	91
PFBA	1.689	213.0 -> 169.0	3055	0.90 µg/L	100
PFBS	3.866	299.0 -> 80.0	3341	0.90 µg/L	96
PFDA	7.684	513.0 -> 469.0	7352	1.03 µg/L	100
PFDoDA	8.408	613.0 -> 569.0	7861	0.96 µg/L	98
PFDS	8.029	599.0 -> 80.0	558	1.06 µg/L	97
PFHpA	5.889	363.0 -> 319.0	12910	0.91 µg/L	99
PFHpS	6.609	449.0 -> 80.0	2370	0.97 µg/L	97
PFHxA	4.950	313.0 -> 269.0	4824	0.94 µg/L	97
PFHxS	5.932	399.0 -> 80.0	2659	0.96 µg/L	m 97
PFNA	7.196	463.0 -> 419.0	8443	0.94 µg/L	96
PFNS	7.655	549.0 -> 80.0	2060	1.00 µg/L	98
PFOA	6.605	413.0 -> 369.0	7759	0.93 µg/L	98
PFOS	7.180	499.0 -> 80.0	3074	0.82 µg/L	m 91
PFPeA	3.550	263.0 -> 219.0	9952	0.95 µg/L	100
PFPeS	5.080	349.0 -> 80.0	2140	1.02 µg/L	99
PFTeDA	9.004	713.0 -> 669.0	10489	0.98 µg/L	99
PFTrDA	8.707	663.0 -> 619.0	8736	0.97 µg/L	99
PFUnDA	8.071	563.0 -> 519.0	7580	1.02 µg/L	97
ADONA	5.987	377.0 -> 251.0	18159	0.89 µg/L	100
9Cl-PF3ONS	7.441	531.0 -> 351.0	1743	0.88 µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	7274	0.93 µg/L	100
HFPO-DA	5.245	329.0 -> 169.0	12678	5.08 µg/L	100

7.6.2
7

Perfluorinated Compounds by LC/MS/MS

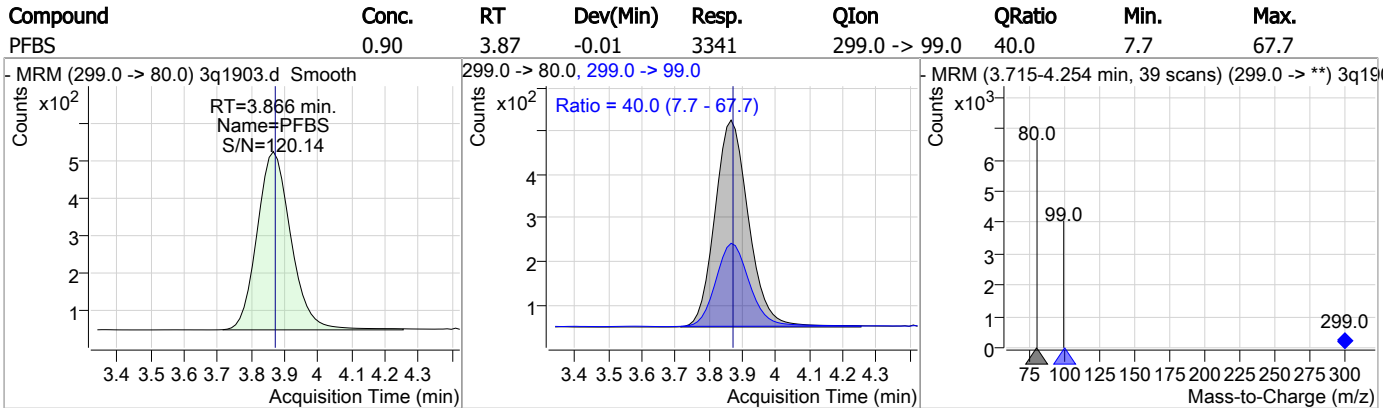
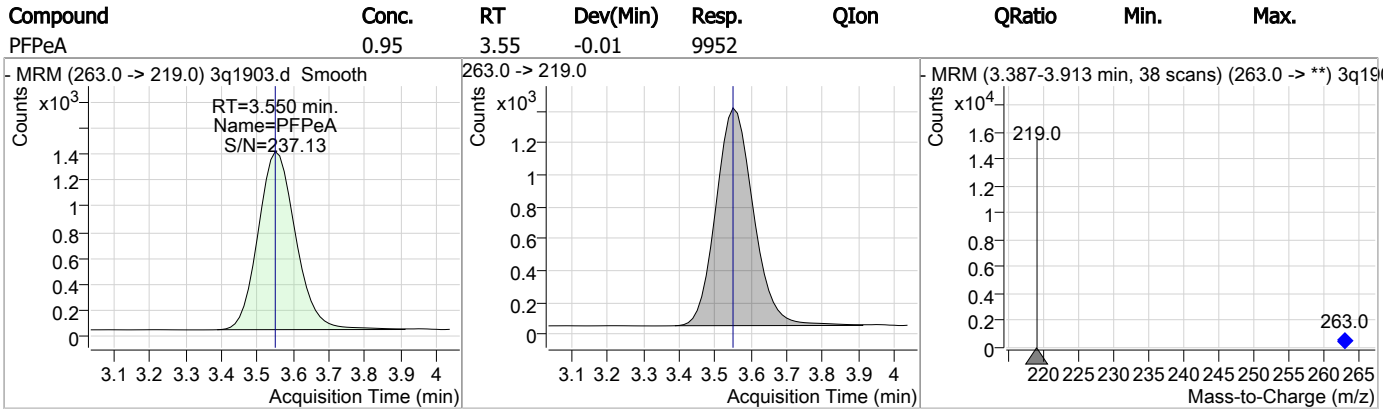
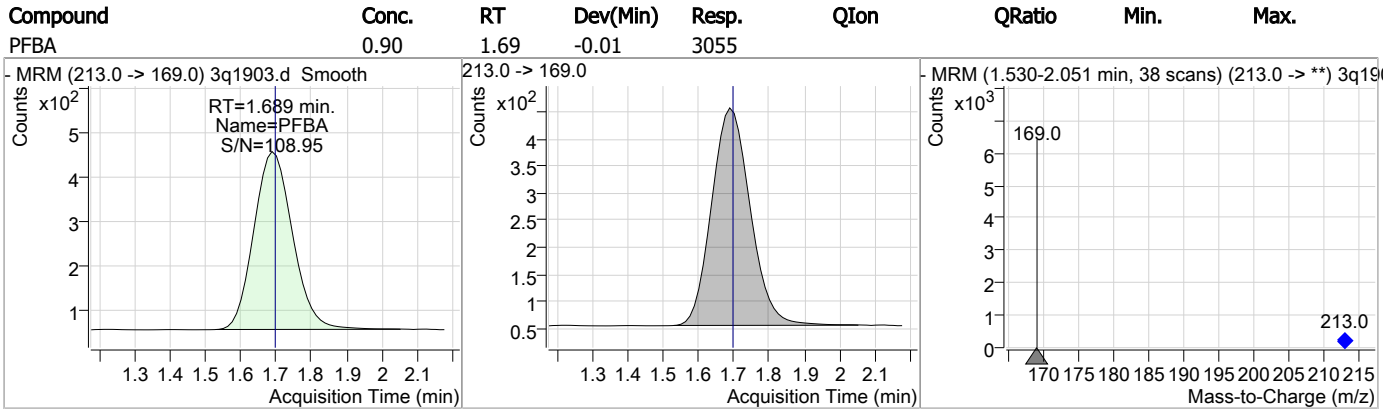
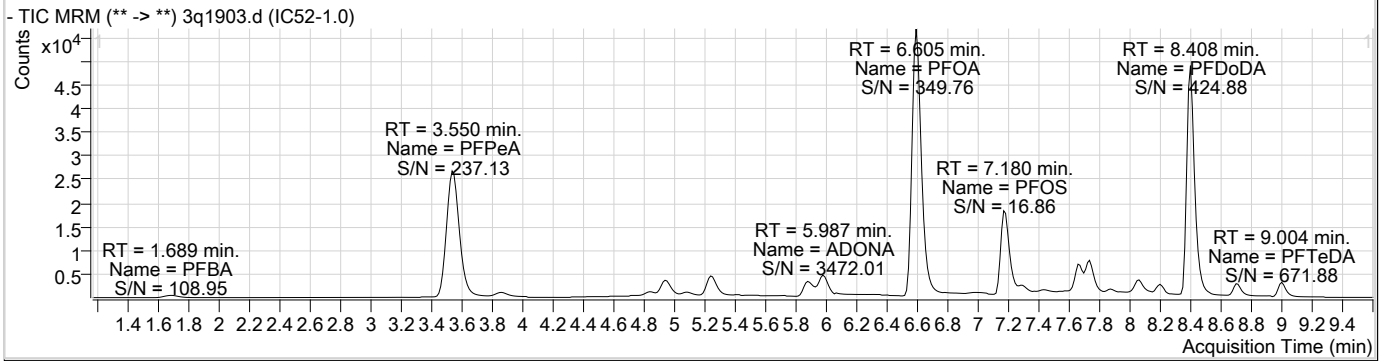
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.2

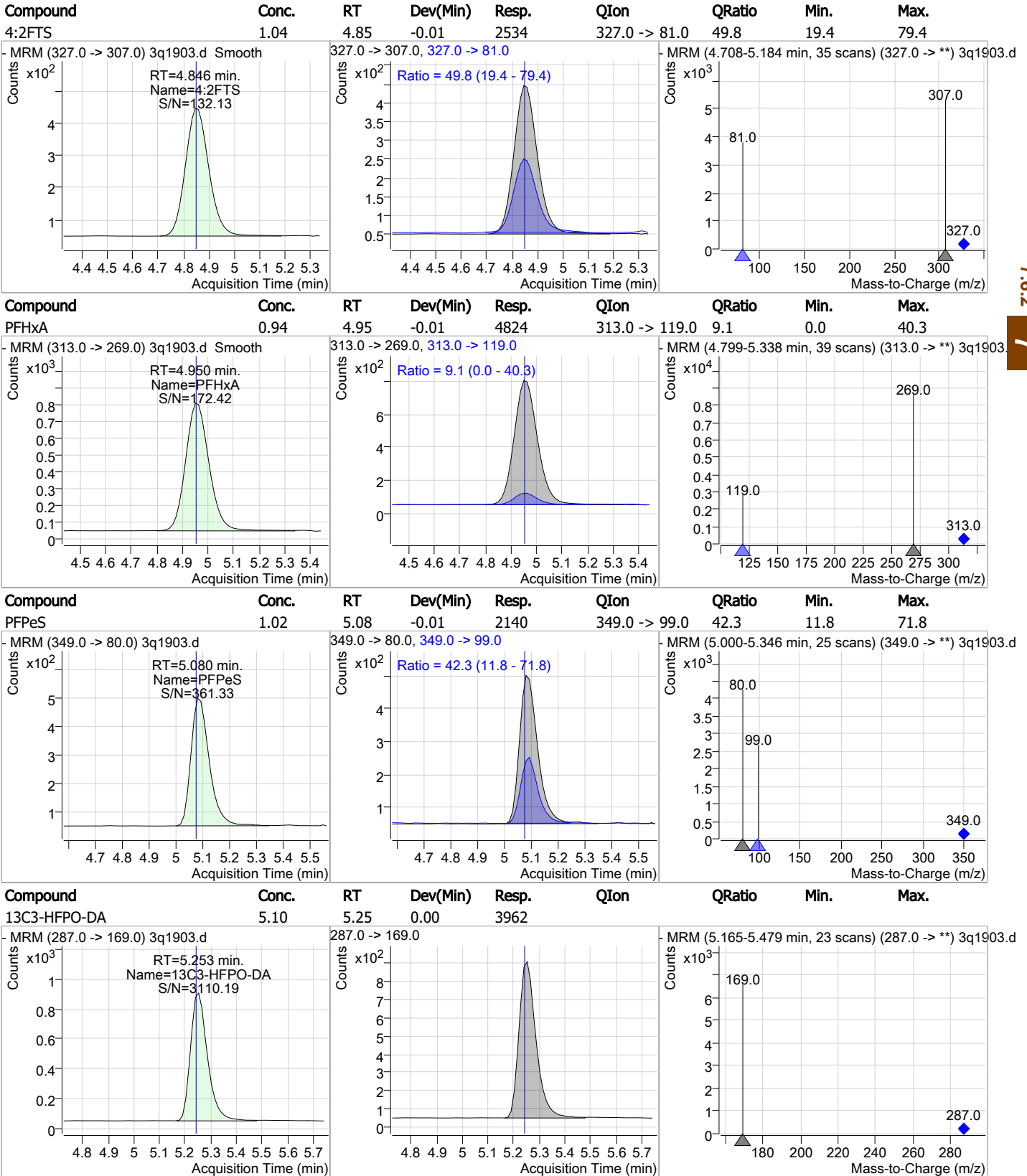
7

Perfluorinated Compounds by LC/MS/MS



7.6.2
7

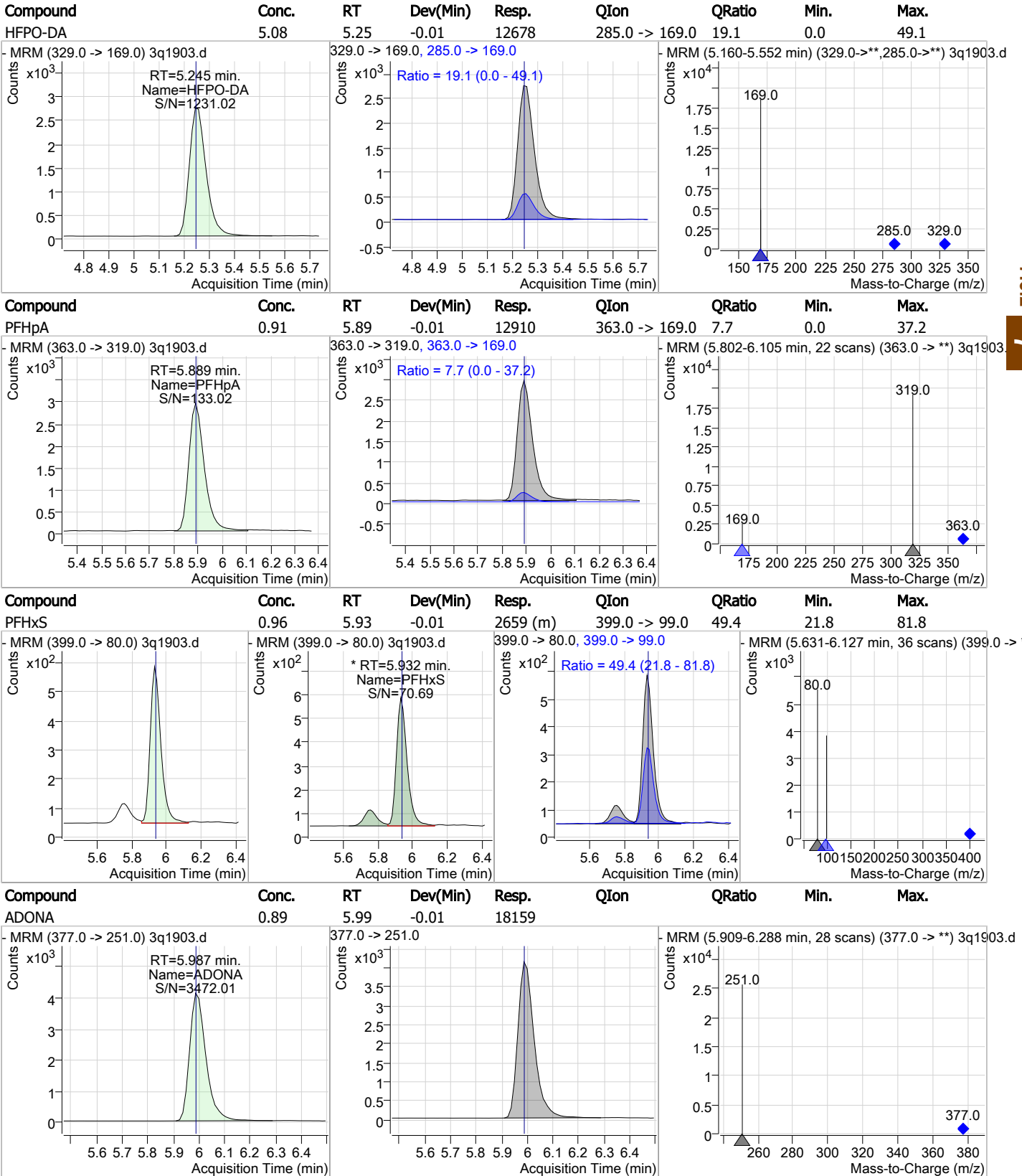
Perfluorinated Compounds by LC/MS/MS



7.6.2

7

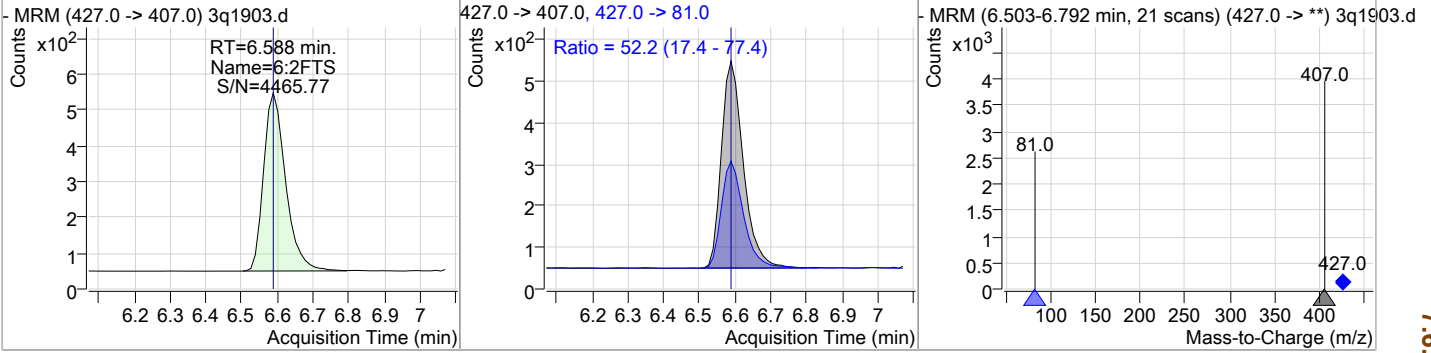
Perfluorinated Compounds by LC/MS/MS



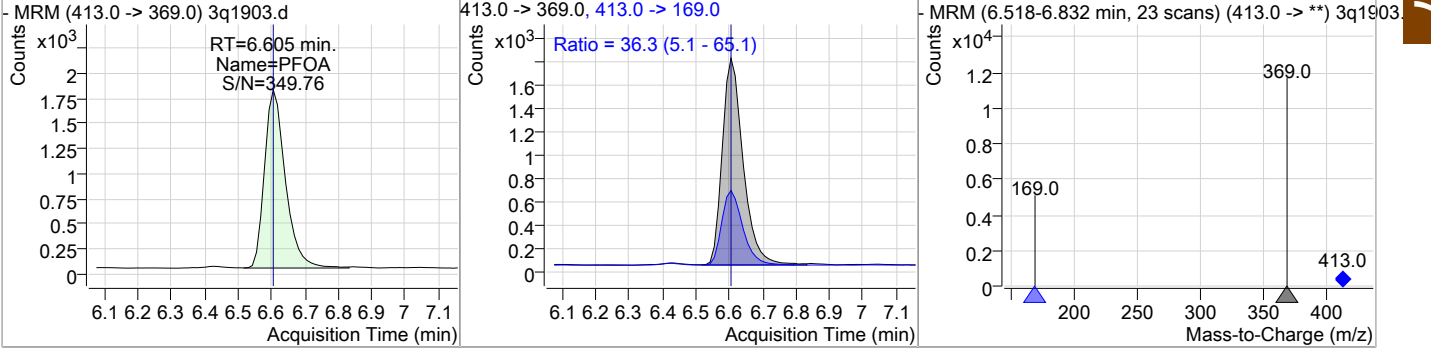
7.6.2
7

Perfluorinated Compounds by LC/MS/MS

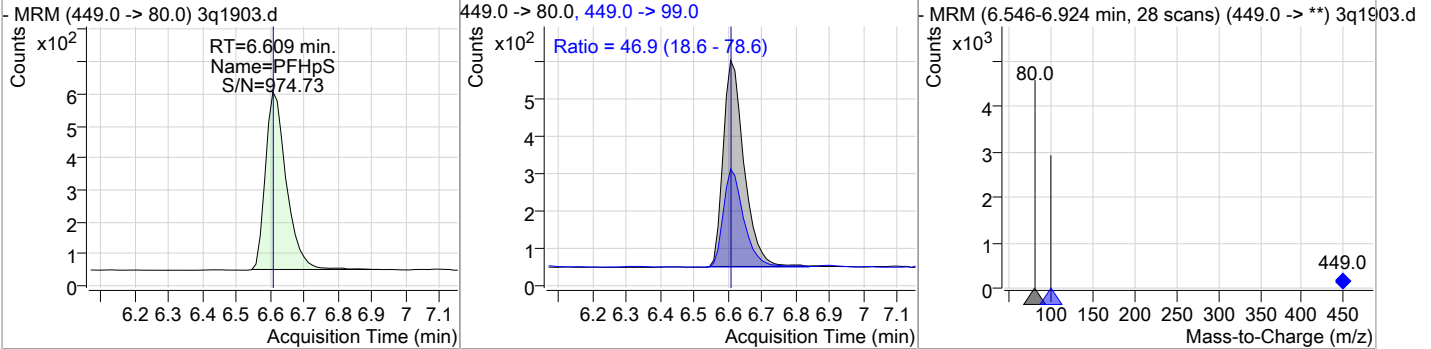
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	1.04	6.59	-0.01	2121	427.0 -> 81.0	52.2	17.4	77.4



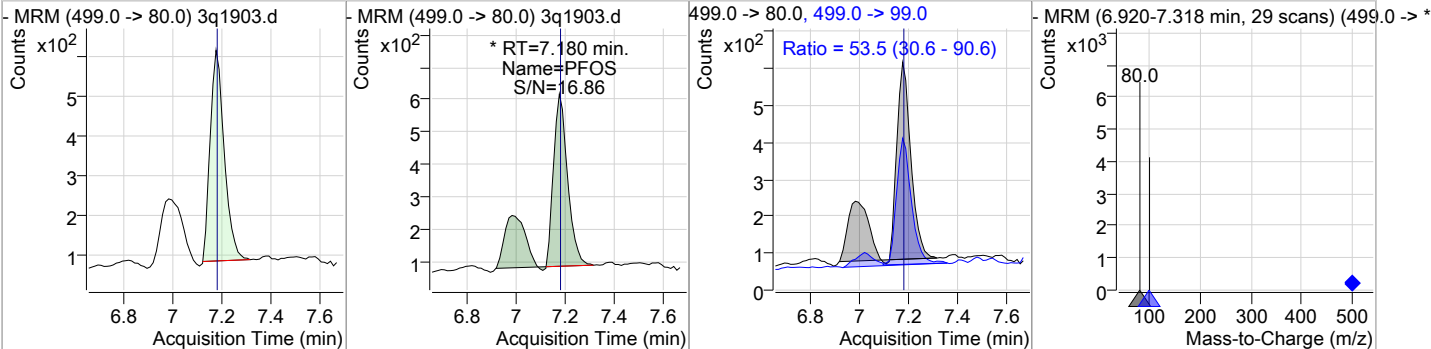
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	0.93	6.61	-0.01	7759	413.0 -> 169.0	36.3	5.1	65.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	0.97	6.61	-0.01	2370	449.0 -> 99.0	46.9	18.6	78.6

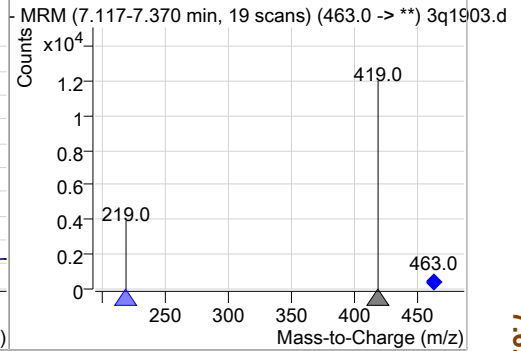
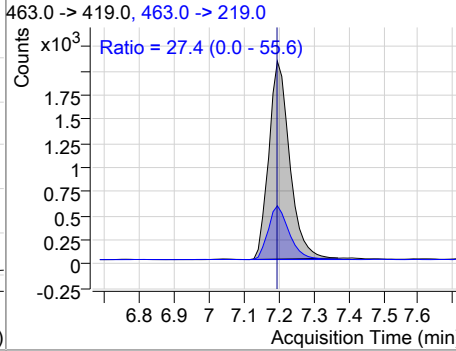
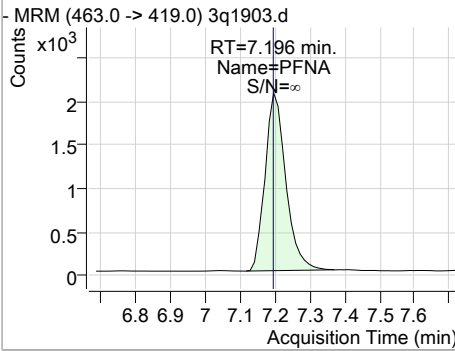


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	0.82	7.18	-0.01	3074 (m)	499.0 -> 99.0	53.5	30.6	90.6

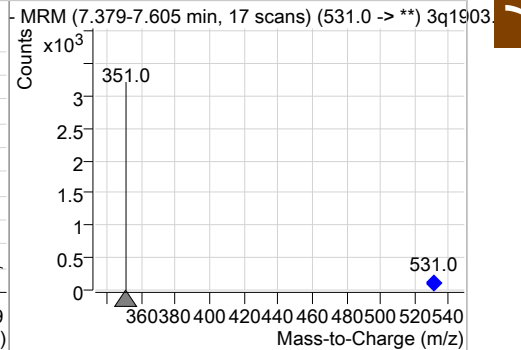
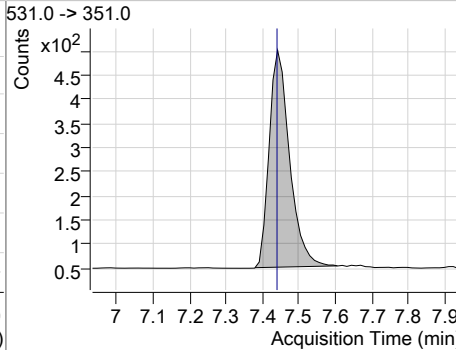
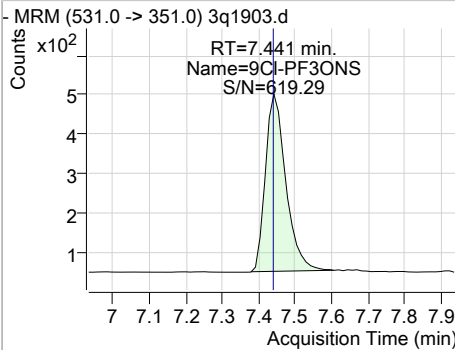


Perfluorinated Compounds by LC/MS/MS

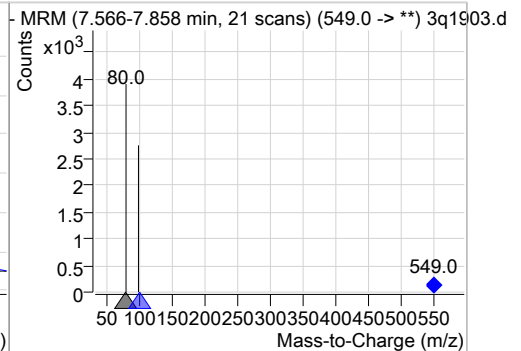
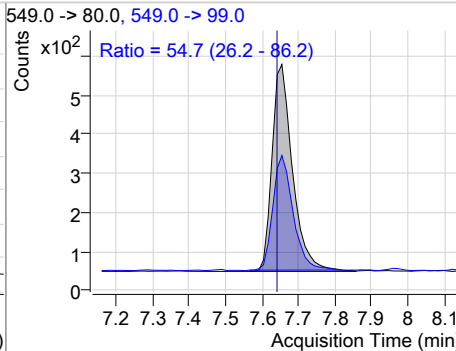
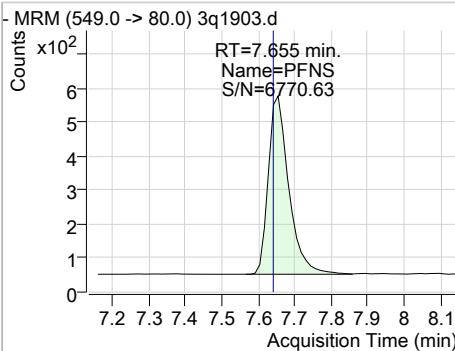
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	0.94	7.20	-0.01	8443	463.0 -> 219.0	27.4	0.0	55.6



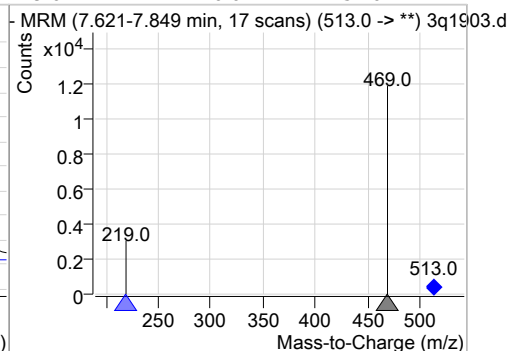
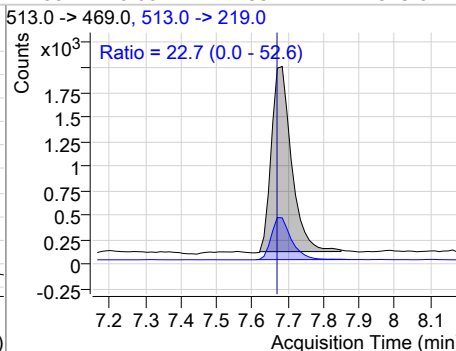
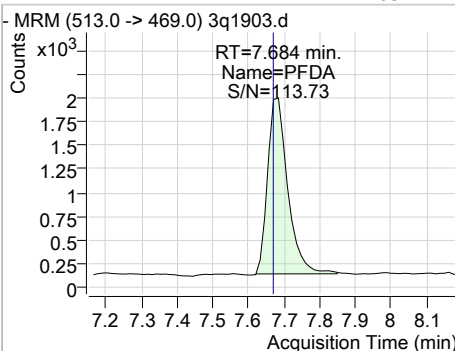
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	0.88	7.44	-0.01	1743	531.0 -> 351.0	27.4	0.0	55.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	1.00	7.65	0.00	2060	549.0 -> 99.0	54.7	26.2	86.2

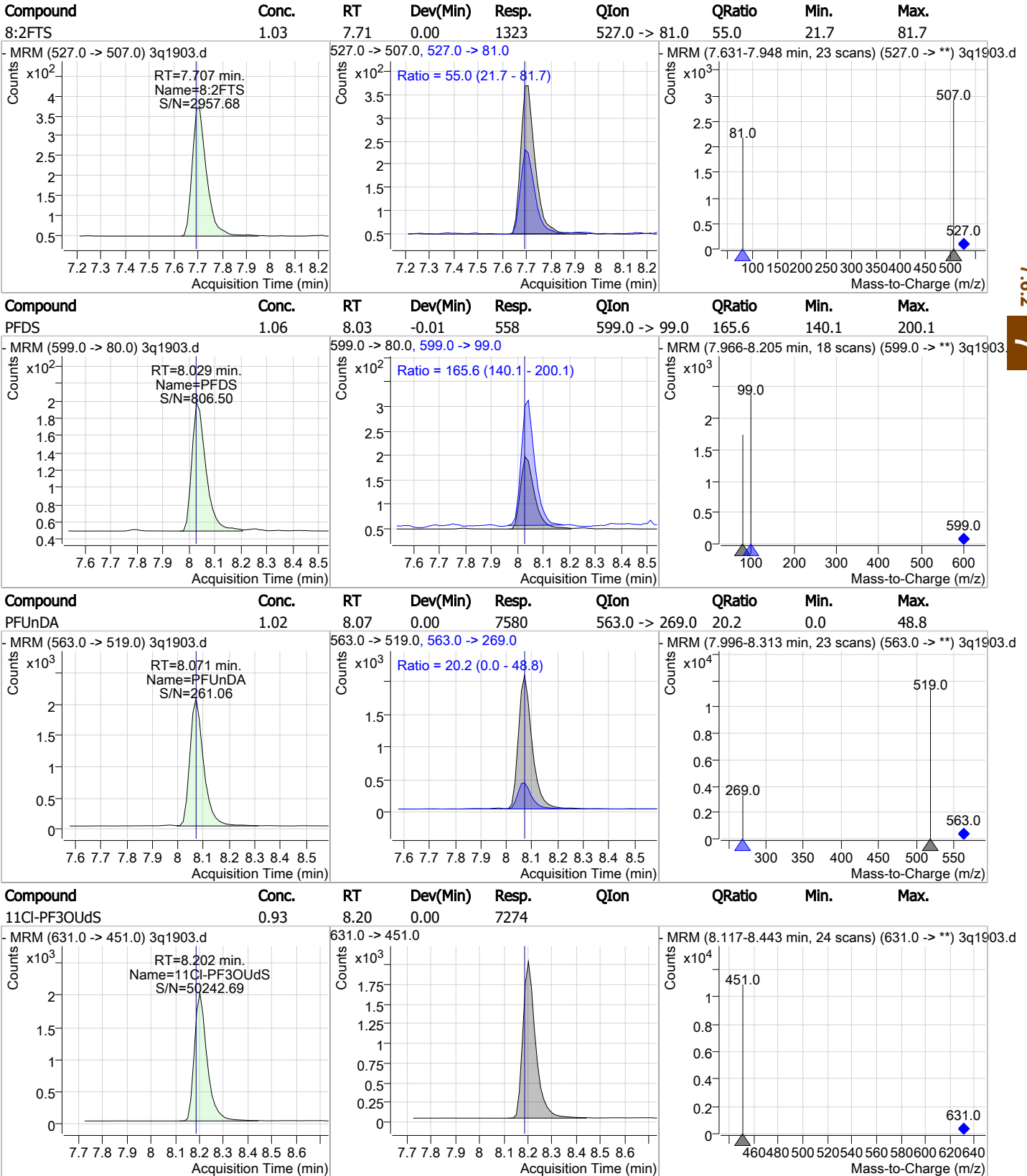


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	1.03	7.68	0.00	7352	513.0 -> 219.0	22.7	0.0	52.6



7.6.2
7

Perfluorinated Compounds by LC/MS/MS

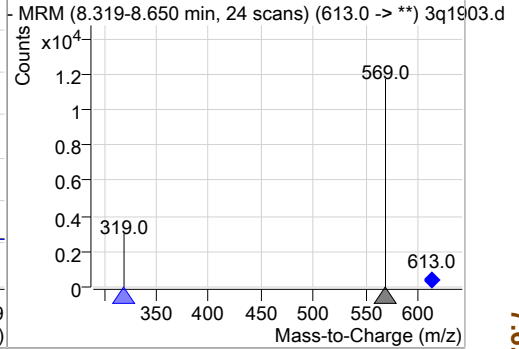
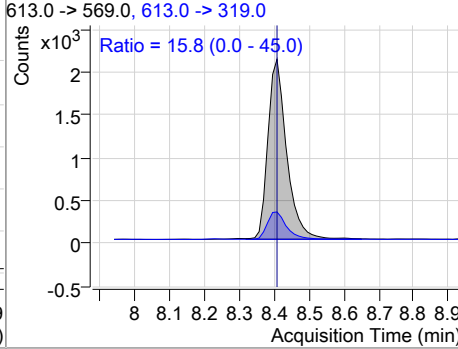
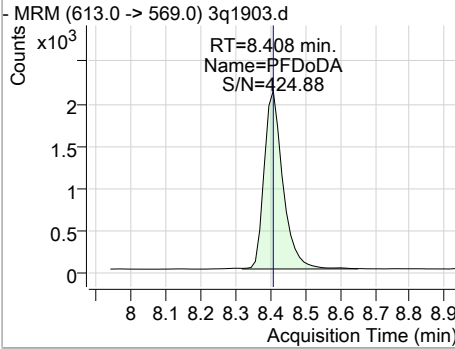


7.6.2

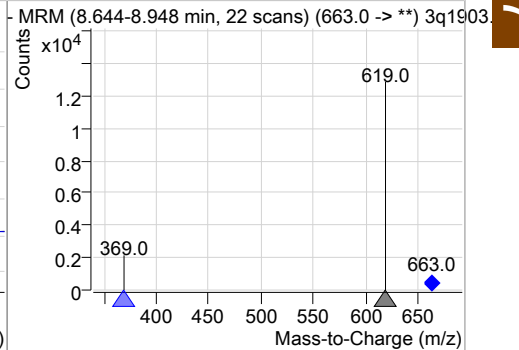
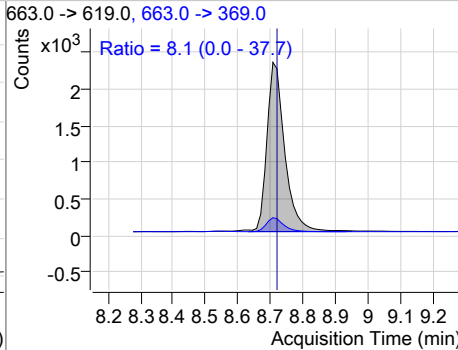
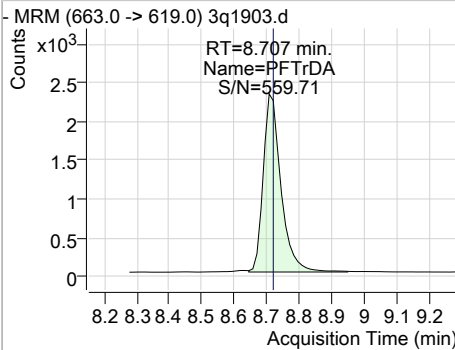
7

Perfluorinated Compounds by LC/MS/MS

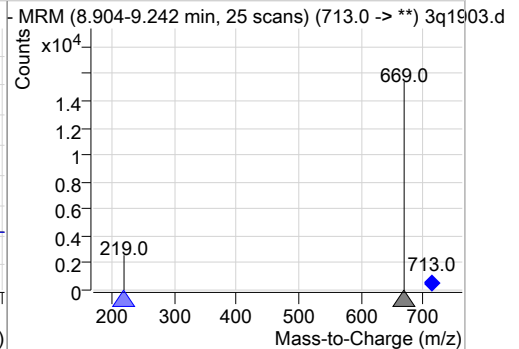
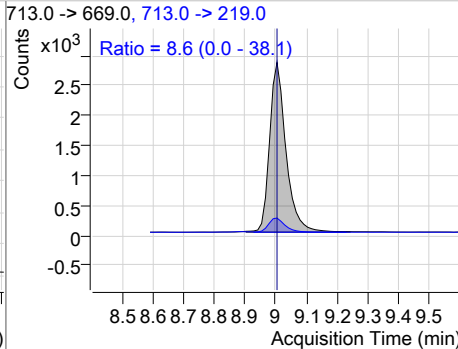
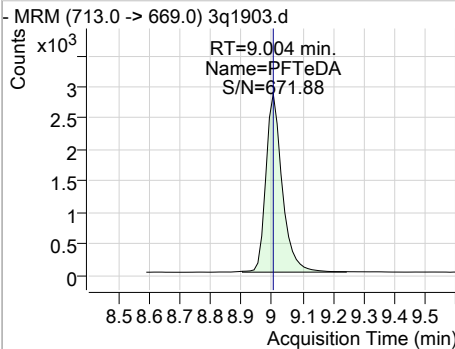
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	0.96	8.41	0.00	7861	613.0 -> 319.0	15.8	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	0.97	8.71	-0.01	8736	663.0 -> 369.0	8.1	0.0	37.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	0.98	9.00	0.00	10489	713.0 -> 219.0	8.6	0.0	38.1



7.6.2

7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1903.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 12:49 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak

7.6.2.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1904.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 1:04:28 PM
 Sample Name : IC52-2.0
 Vial : P1-A4
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.587	429.0 -> 409.0	39511	20.00 µg/L	-0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	177705	20.00 µg/L	0.000
13C2-PFOA	6.604	415.0 -> 370.0	192825	20.00 µg/L	-0.013
13C3-PFPeA	3.546	266.0 -> 222.0	151445	20.00 µg/L	-0.013
13C4-PFOS	7.179	503.0 -> 80.0	61617	20.00 µg/L	-0.013
d3-MeFOSAA	7.741	573.0 -> 419.0	20554	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.670	515.0 -> 470.0	20224	1.94 µg/L	-0.014
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 9.7%	
13C2-PFHxA	4.949	315.0 -> 270.0	20267	1.92 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 9.6%	
d5-EtFOSAA	7.865	589.0 -> 419.0	2446	2.06 µg/L	-0.025
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 10.3%	
13C3-HFPO-DA	5.253	287.0 -> 169.0	8149	10.30 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 10.3%	
Target Compounds					
4:2FTS	4.846	327.0 -> 307.0	5116	2.06 µg/L	QValue 97
6:2FTS	6.588	427.0 -> 407.0	4252	2.05 µg/L	96
8:2FTS	7.695	527.0 -> 507.0	2769	2.12 µg/L	98
EtFOSAA	7.878	584.0 -> 419.0	1937	2.02 µg/L	93
FOSA	7.295	498.0 -> 78.0	9364	1.87 µg/L	99
MeFOSAA	7.742	570.0 -> 419.0	2299	1.96 µg/L	95
PFBA	1.701	213.0 -> 169.0	6157	1.77 µg/L	100
PFBS	3.866	299.0 -> 80.0	6955	1.87 µg/L	99
PFDA	7.670	513.0 -> 469.0	14663	2.01 µg/L	95
PFDoDA	8.395	613.0 -> 569.0	16337	1.92 µg/L	100
PFDS	8.029	599.0 -> 80.0	1063	2.01 µg/L	98
PFHpA	5.889	363.0 -> 319.0	26154	1.80 µg/L	98
PFHpS	6.609	449.0 -> 80.0	4768	1.94 µg/L	95
PFHxA	4.950	313.0 -> 269.0	9382	1.80 µg/L	100
PFHxS	5.932	399.0 -> 80.0	5305	1.91 µg/L	m 94
PFNA	7.196	463.0 -> 419.0	17297	1.89 µg/L	97
PFNS	7.642	549.0 -> 80.0	4315	2.08 µg/L	99
PFOA	6.605	413.0 -> 369.0	16118	1.89 µg/L	100
PFOS	7.180	499.0 -> 80.0	6692	1.79 µg/L	m 81
PFPeA	3.550	263.0 -> 219.0	19934	1.87 µg/L	100
PFPeS	5.080	349.0 -> 80.0	4204	1.97 µg/L	98
PFTeDA	9.004	713.0 -> 669.0	21420	1.92 µg/L	99
PFTrDA	8.707	663.0 -> 619.0	17954	1.92 µg/L	99
PFUnDA	8.059	563.0 -> 519.0	15549	2.01 µg/L	98
ADONA	5.987	377.0 -> 251.0	37850	1.83 µg/L	100
9Cl-PF3ONS	7.441	531.0 -> 351.0	3885	1.91 µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	14784	1.86 µg/L	100
HFPO-DA	5.245	329.0 -> 169.0	26130	10.28 µg/L	98

7.6.3

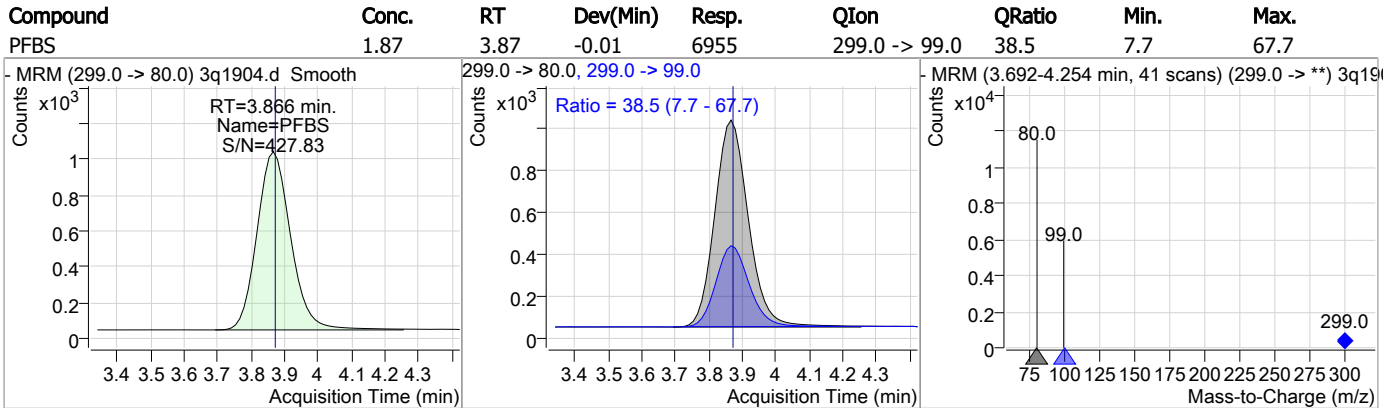
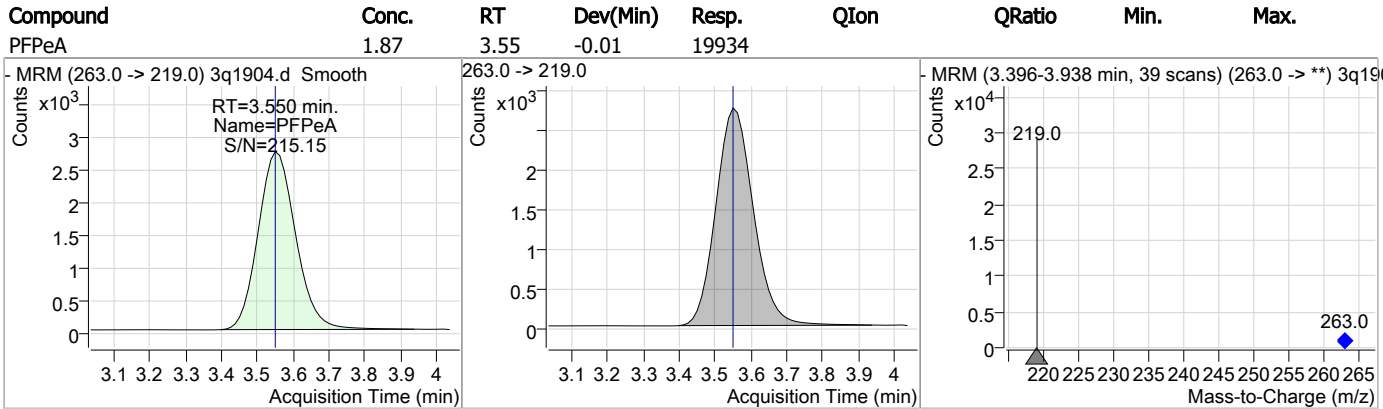
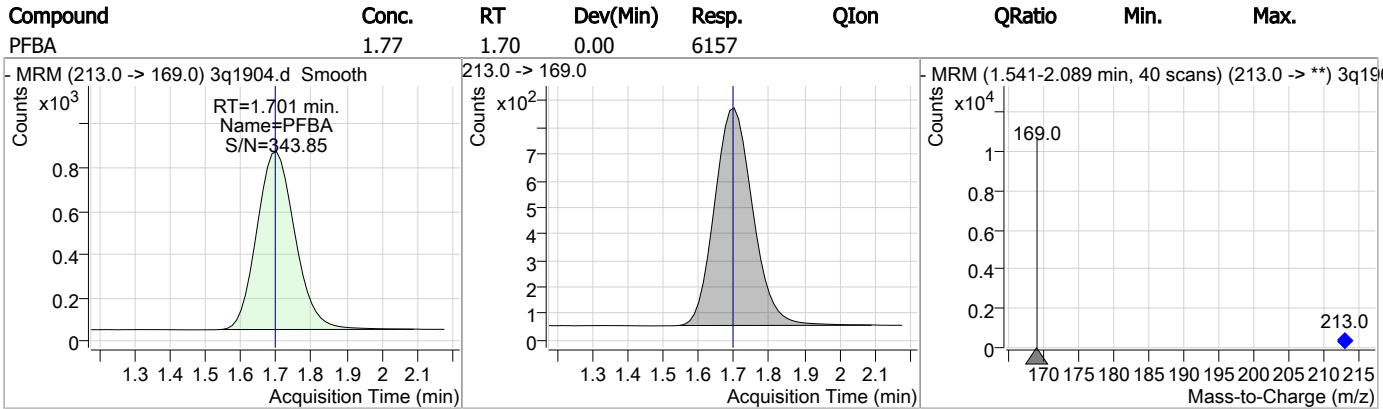
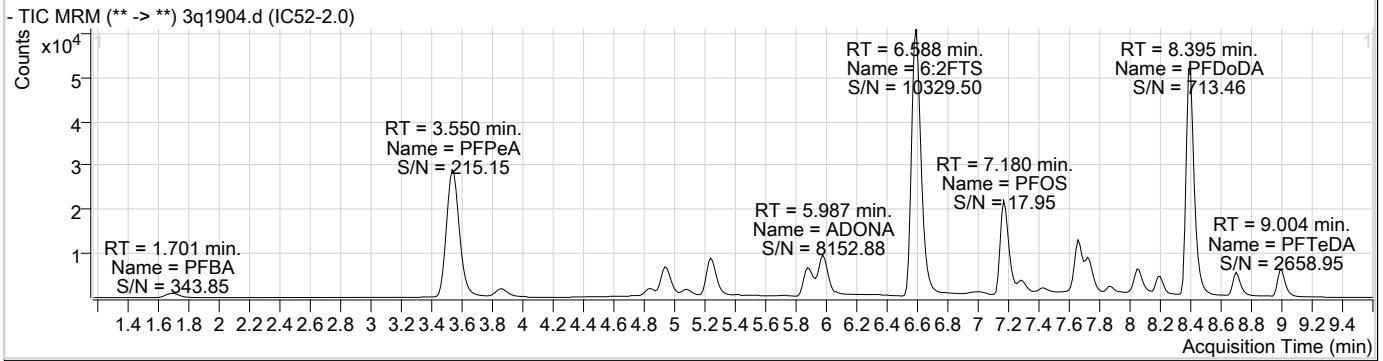
7

Perfluorinated Compounds by LC/MS/MS

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

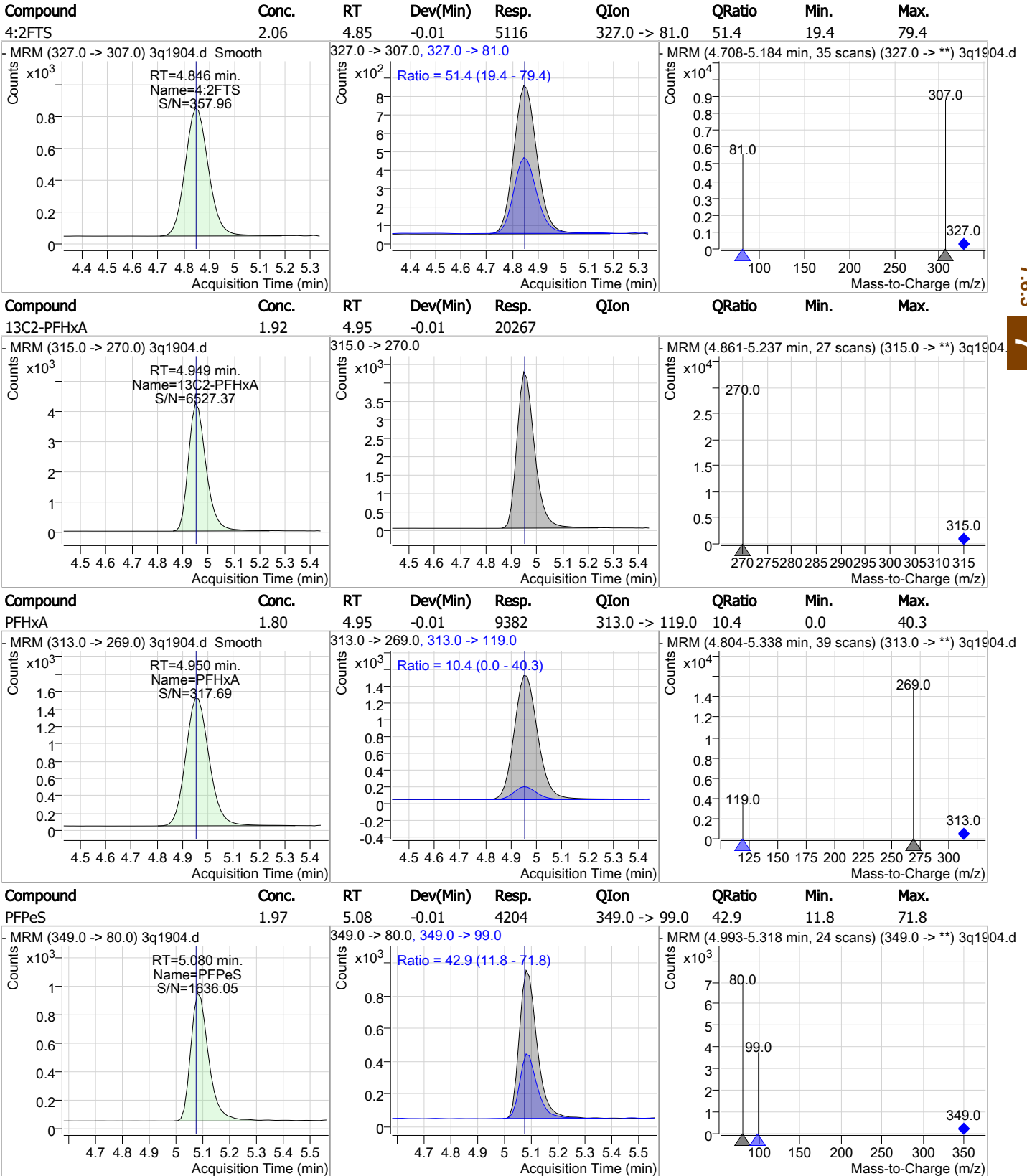
Perfluorinated Compounds by LC/MS/MS



7.6.3

7

Perfluorinated Compounds by LC/MS/MS

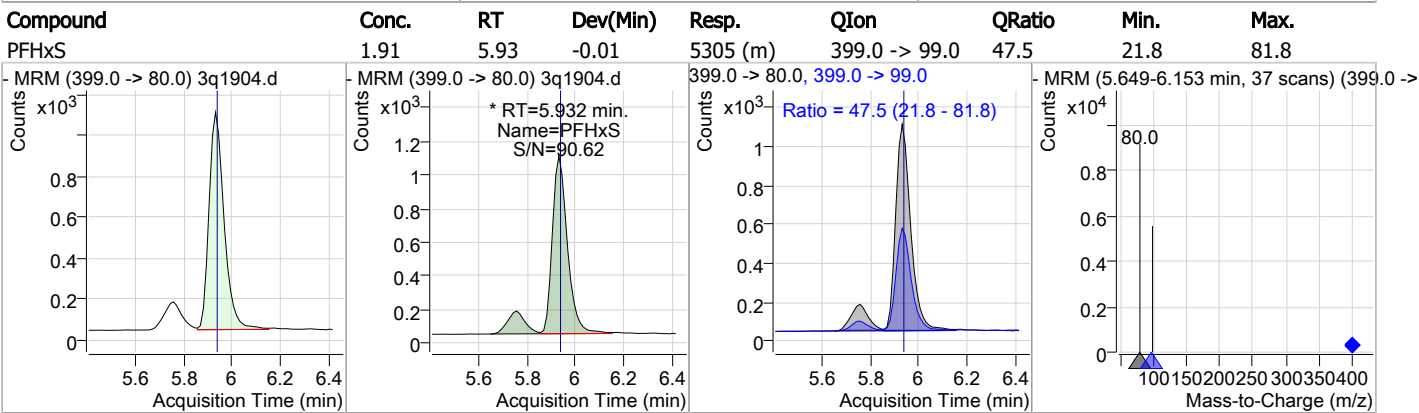
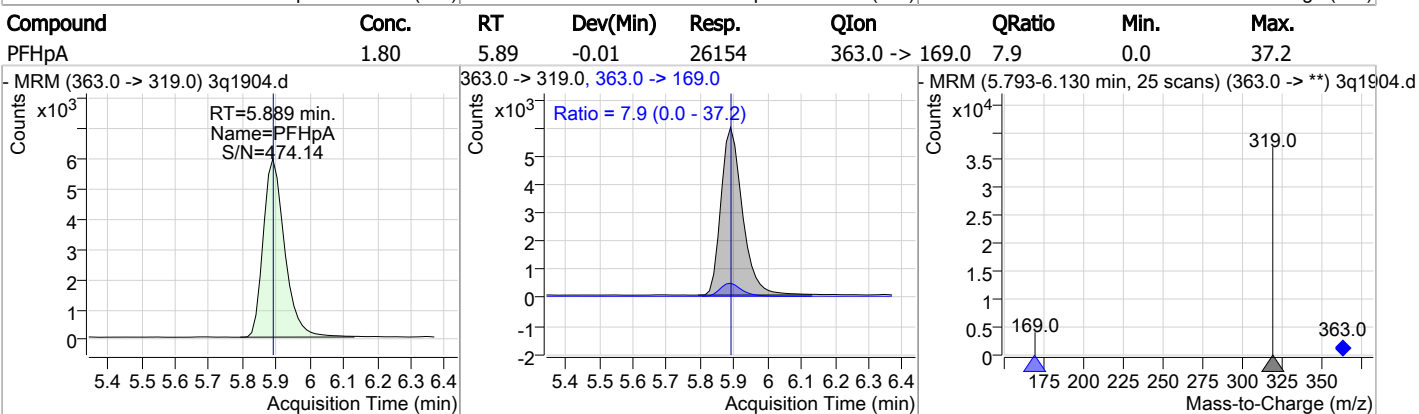
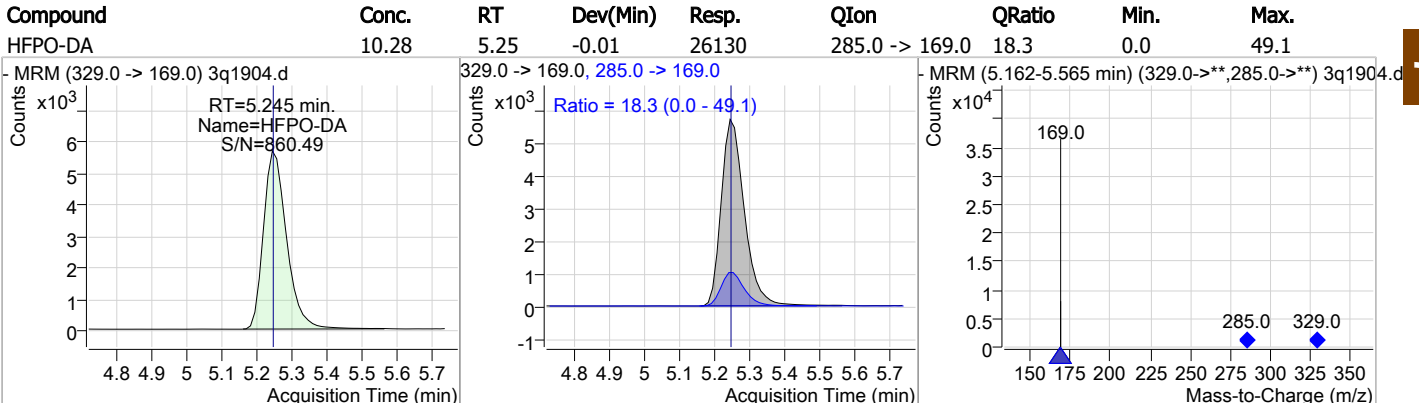
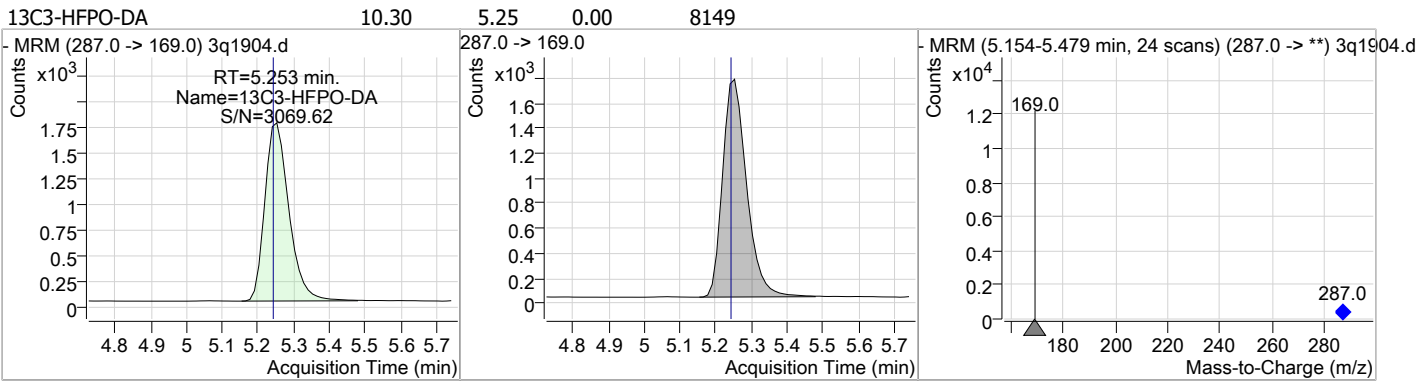


7.6.3

7

Perfluorinated Compounds by LC/MS/MS

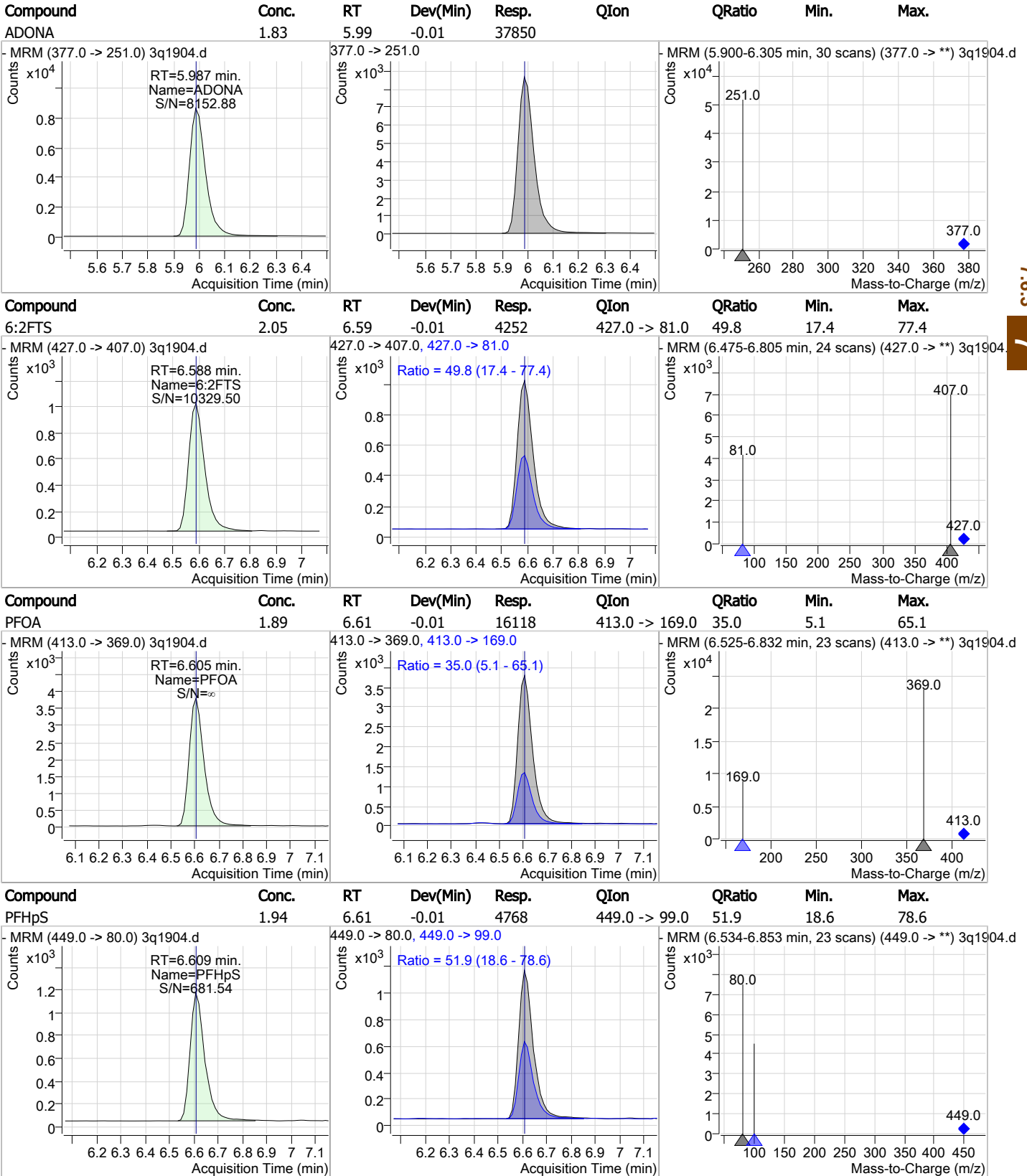
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



7.6.3
7



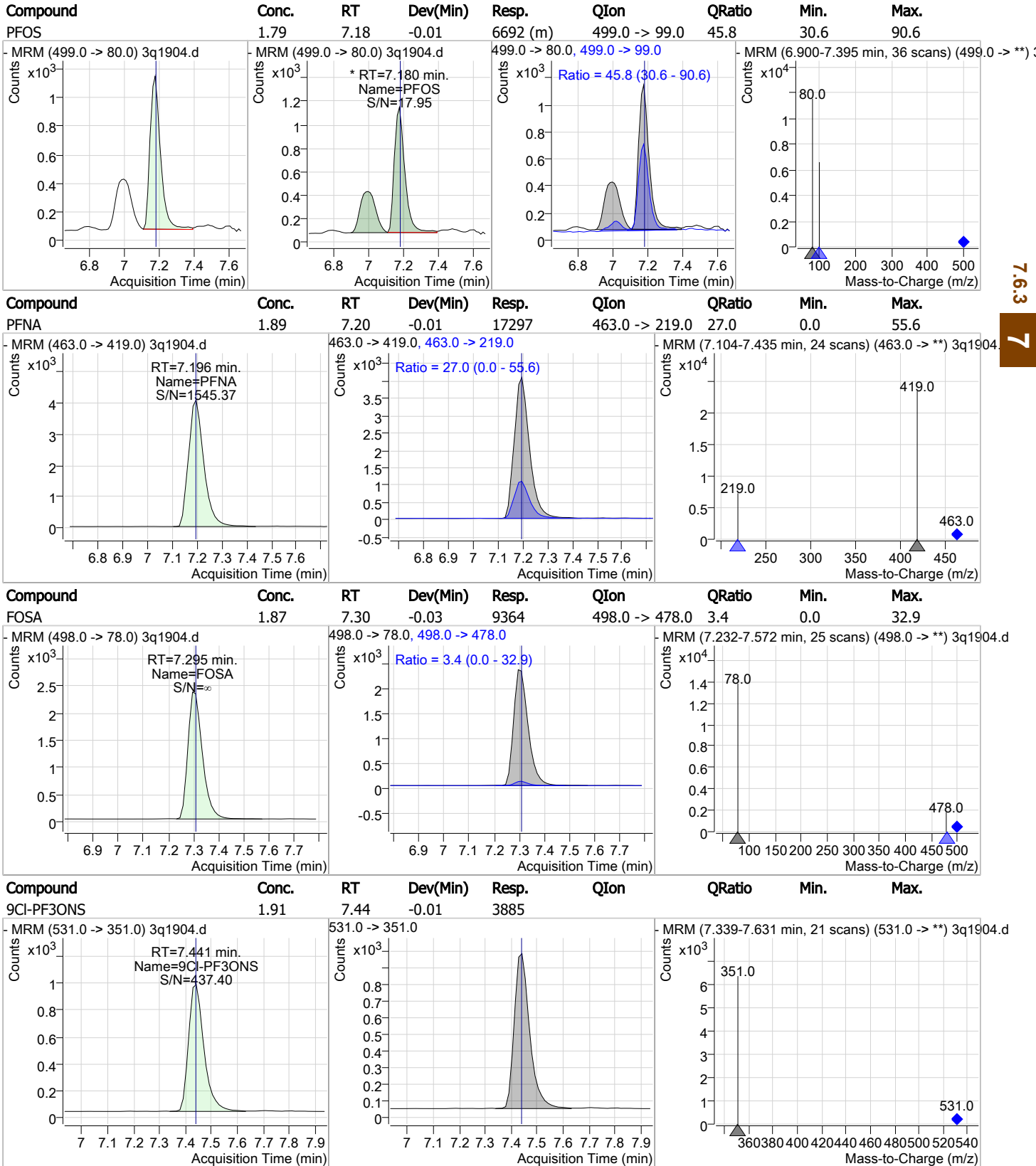
Perfluorinated Compounds by LC/MS/MS



7.6.3
7



Perfluorinated Compounds by LC/MS/MS

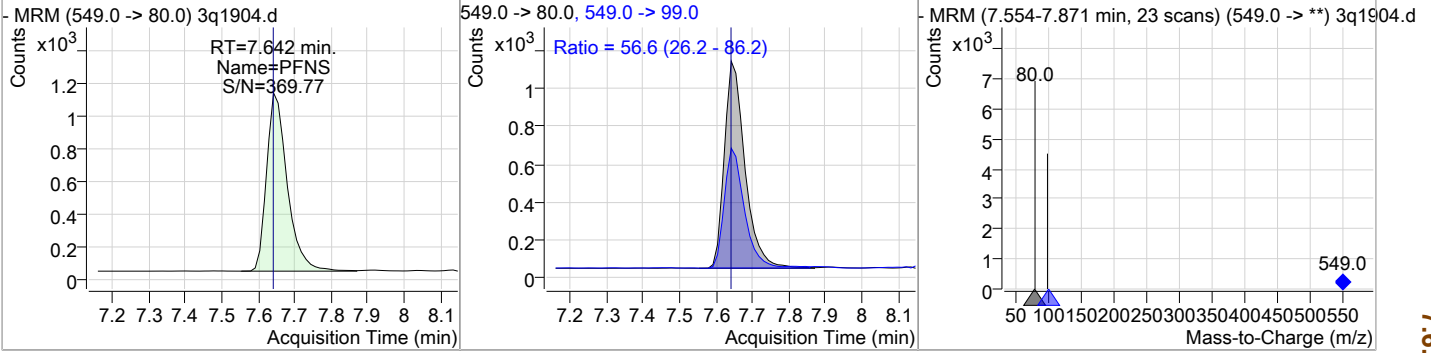


7.6.3
7

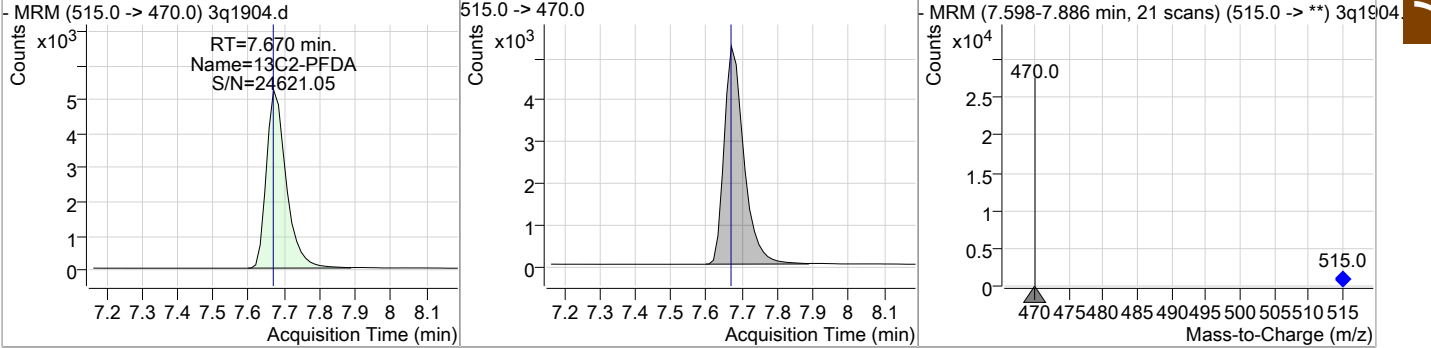


Perfluorinated Compounds by LC/MS/MS

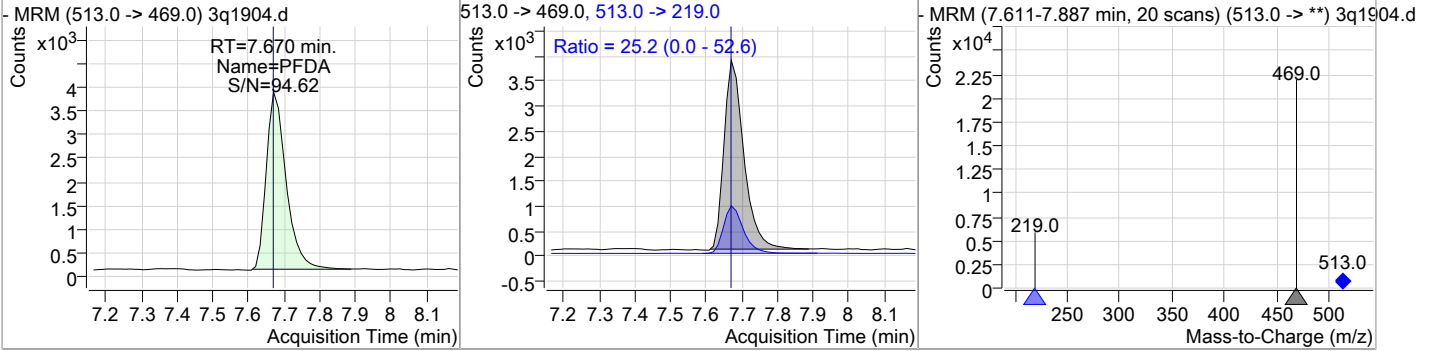
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	2.08	7.64	-0.01	4315	549.0 -> 99.0	56.6	26.2	86.2



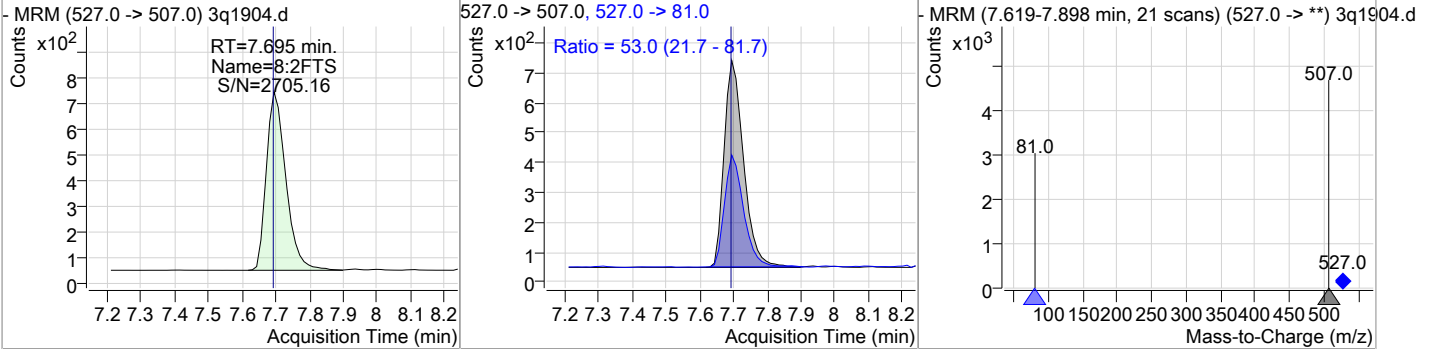
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	1.94	7.67	-0.01	20224				



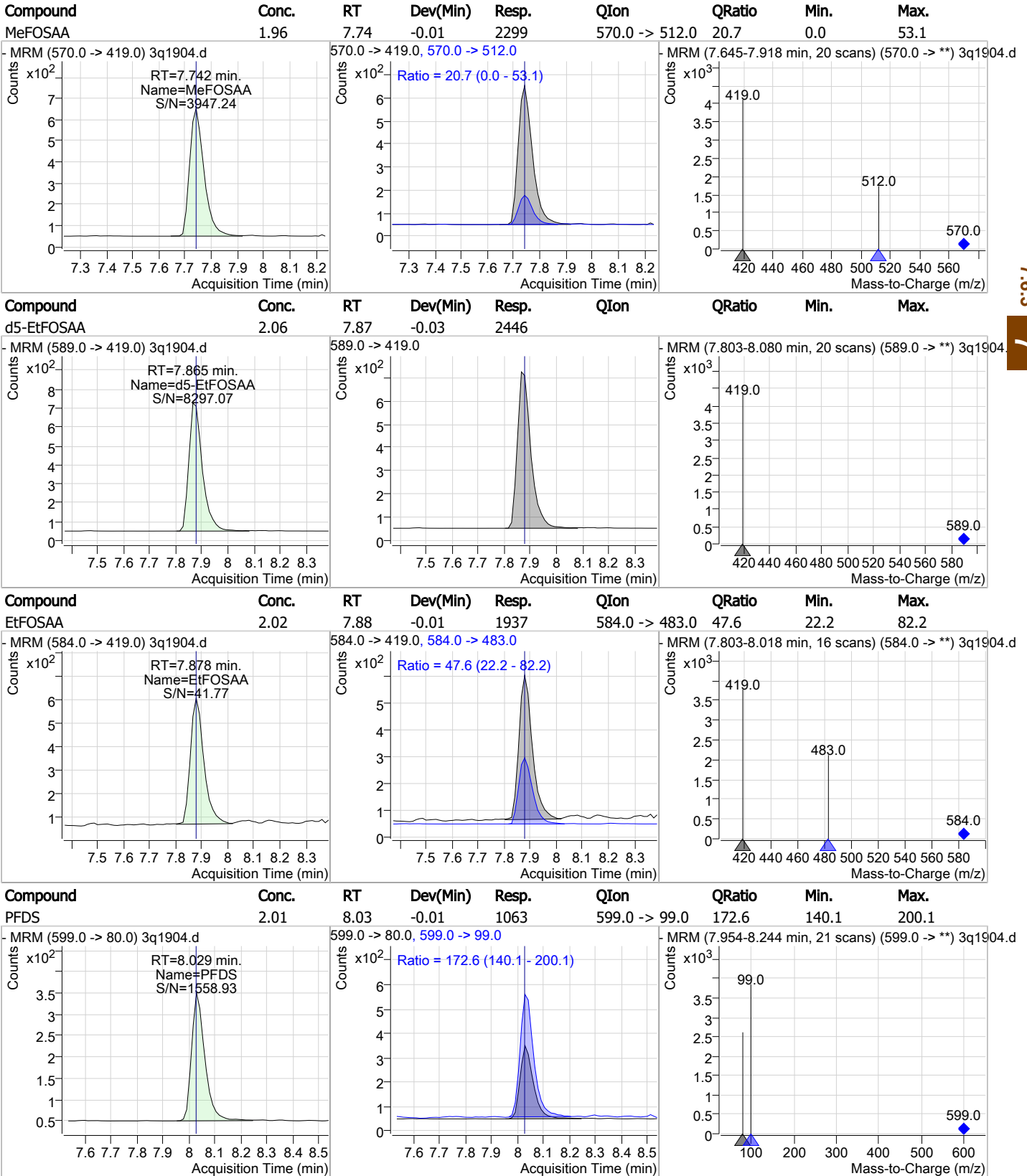
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	2.01	7.67	-0.01	14663	513.0 -> 219.0	25.2	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	2.12	7.69	-0.01	2769	527.0 -> 81.0	53.0	21.7	81.7



Perfluorinated Compounds by LC/MS/MS



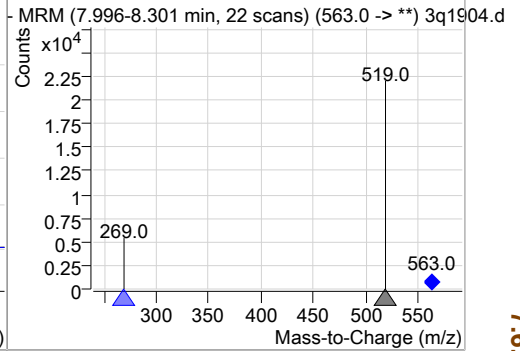
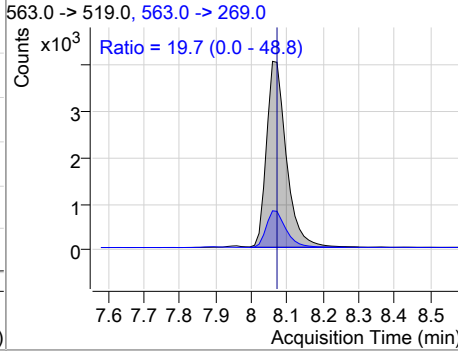
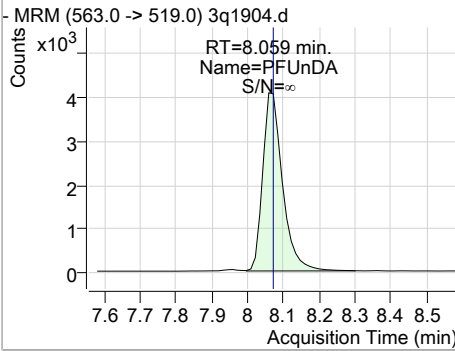
7.6.3

7

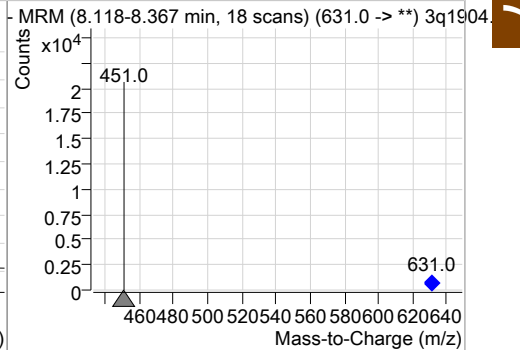
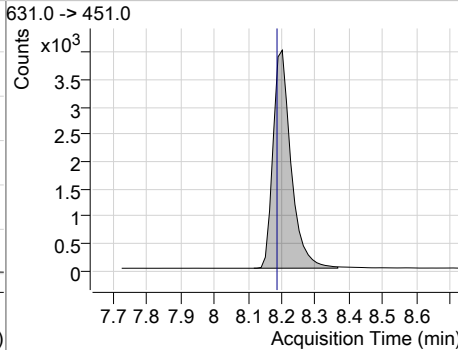
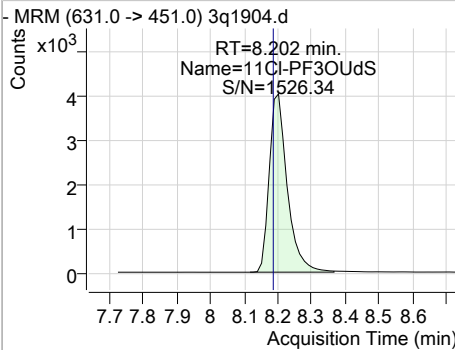


Perfluorinated Compounds by LC/MS/MS

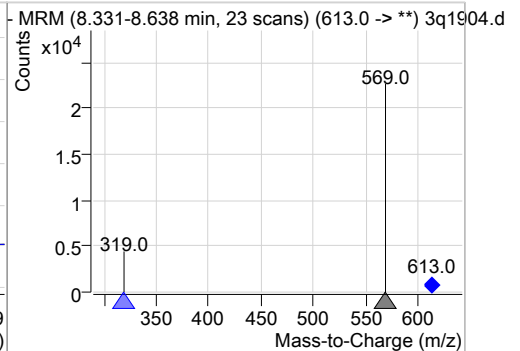
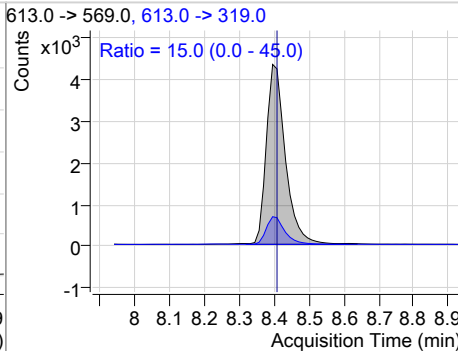
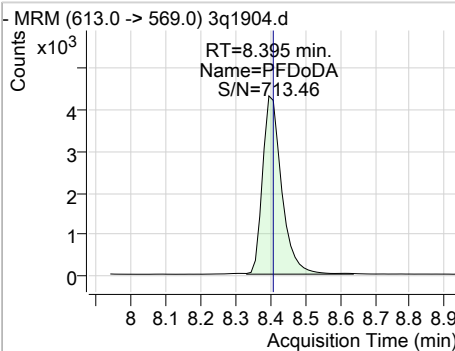
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	2.01	8.06	-0.01	15549	563.0 -> 269.0	19.7	0.0	48.8



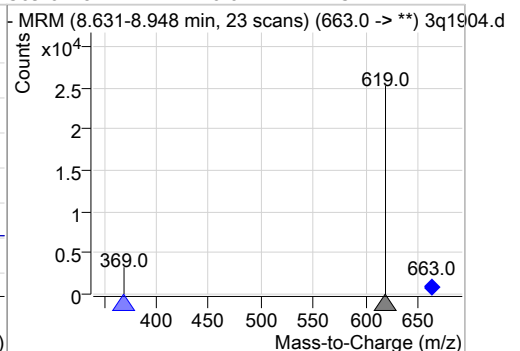
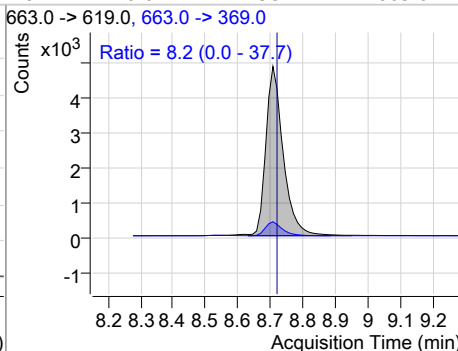
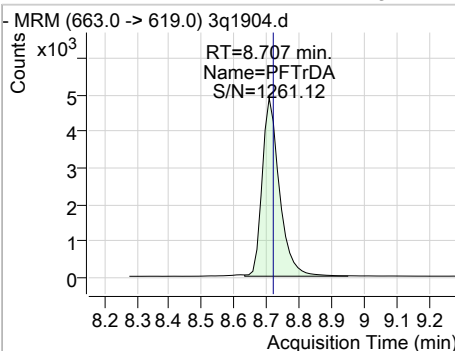
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	1.86	8.20	0.00	14784	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	1.92	8.40	-0.01	16337	613.0 -> 319.0	15.0	0.0	45.0

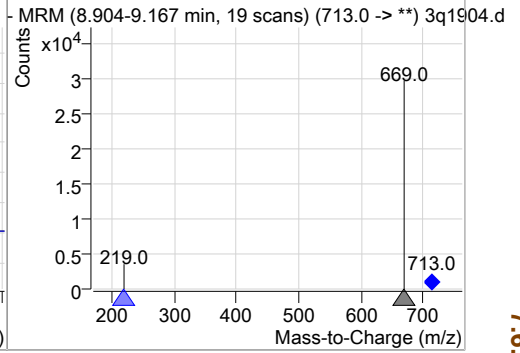
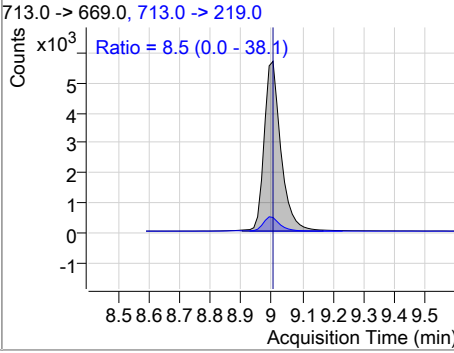
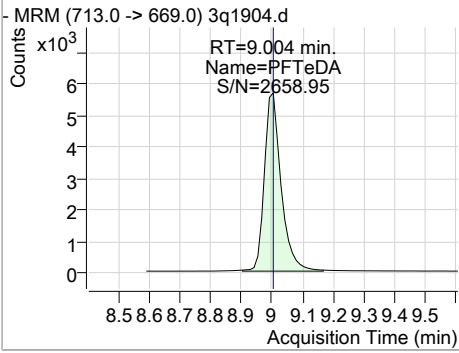


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	1.92	8.71	-0.01	17954	663.0 -> 369.0	8.2	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	1.92	9.00	0.00	21420	713.0 -> 219.0	8.5	0.0	38.1



7.6.3
7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1904.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 13:04 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak

7.6.3.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1905.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 1:19:48 PM
 Sample Name : IC52-5.0
 Vial : P1-A5
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.587	429.0 -> 409.0	39571	20.00 µg/L	-0.013
13C2-PFDoDA	8.407	615.0 -> 570.0	176657	20.00 µg/L	0.000
13C2-PFOA	6.604	415.0 -> 370.0	190966	20.00 µg/L	-0.013
13C3-PFPeA	3.559	266.0 -> 222.0	149856	20.00 µg/L	0.000
13C4-PFOS	7.179	503.0 -> 80.0	61612	20.00 µg/L	-0.013
d3-MeFOSAA	7.741	573.0 -> 419.0	20400	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	49693	4.82 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 24.1%	
13C2-PFHxA	4.961	315.0 -> 270.0	49949	4.78 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 23.9%	
d5-EtFOSAA	7.878	589.0 -> 419.0	5731	4.86 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 24.3%	
13C3-HFPO-DA	5.253	287.0 -> 169.0	19596	25.08 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 25.1%	
Target Compounds					
4:2FTS	4.858	327.0 -> 307.0	12493	5.03 µg/L	QValue 99
6:2FTS	6.588	427.0 -> 407.0	10467	5.05 µg/L	99
8:2FTS	7.707	527.0 -> 507.0	6774	5.18 µg/L	94
EtFOSAA	7.878	584.0 -> 419.0	4698	4.94 µg/L	99
FOSA	7.308	498.0 -> 78.0	23410	4.72 µg/L	99
MeFOSAA	7.742	570.0 -> 419.0	5511	4.73 µg/L	98
PFBA	1.701	213.0 -> 169.0	15190	4.41 µg/L	100
PFBS	3.878	299.0 -> 80.0	16992	4.56 µg/L	98
PFDA	7.684	513.0 -> 469.0	36848	5.11 µg/L	98
PFDoDA	8.408	613.0 -> 569.0	40220	4.75 µg/L	100
PFDS	8.029	599.0 -> 80.0	2591	4.91 µg/L	99
PFHpA	5.889	363.0 -> 319.0	66357	4.62 µg/L	99
PFHpS	6.621	449.0 -> 80.0	11784	4.81 µg/L	99
PFHxA	4.962	313.0 -> 269.0	23289	4.51 µg/L	98
PFHxS	5.932	399.0 -> 80.0	13157	4.74 µg/L	m 96
PFNA	7.196	463.0 -> 419.0	42886	4.74 µg/L	100
PFNS	7.655	549.0 -> 80.0	10261	4.96 µg/L	98
PFOA	6.605	413.0 -> 369.0	39518	4.68 µg/L	99
PFOS	7.180	499.0 -> 80.0	17062	4.56 µg/L	m 82
PFPeA	3.562	263.0 -> 219.0	49398	4.69 µg/L	100
PFPeS	5.093	349.0 -> 80.0	10250	4.86 µg/L	99
PFTeDA	9.004	713.0 -> 669.0	54421	4.92 µg/L	100
PFTrDA	8.707	663.0 -> 619.0	44883	4.83 µg/L	98
PFUnDA	8.071	563.0 -> 519.0	37627	4.90 µg/L	99
ADONA	5.999	377.0 -> 251.0	92811	4.52 µg/L	100
9Cl-PF3ONS	7.441	531.0 -> 351.0	9297	4.63 µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	36301	4.61 µg/L	100
HFPO-DA	5.258	329.0 -> 169.0	63765	25.40 µg/L	99

7.6.4

7

Perfluorinated Compounds by LC/MS/MS

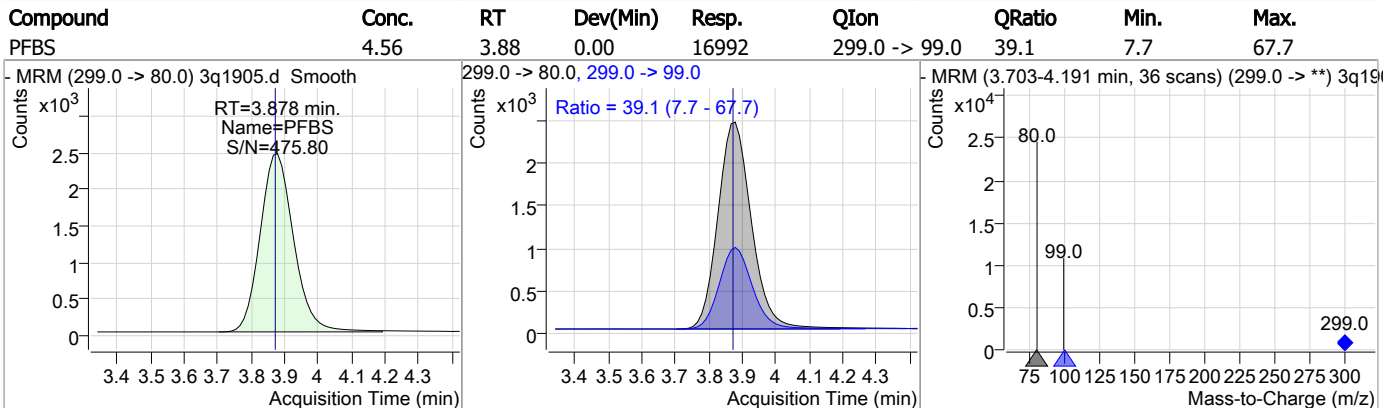
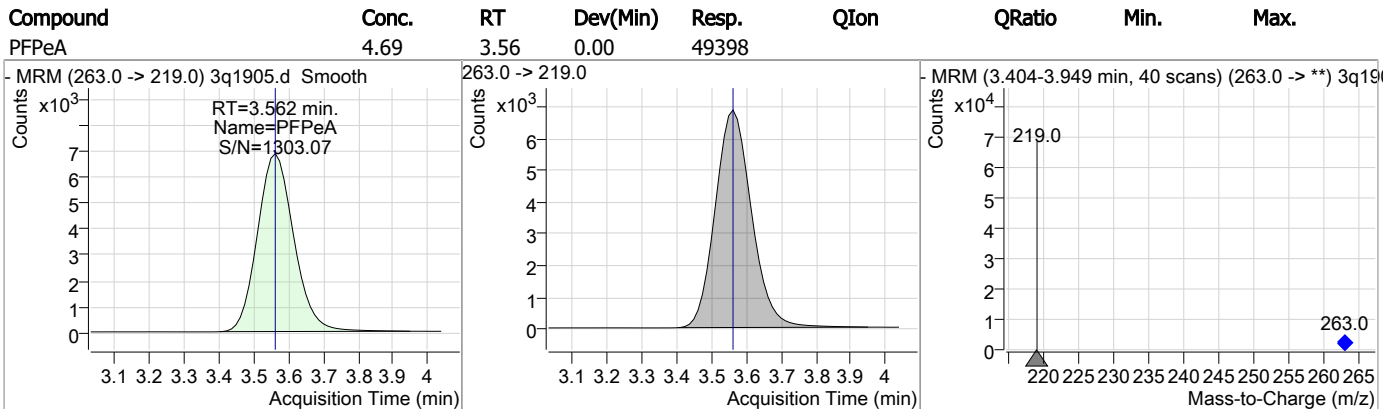
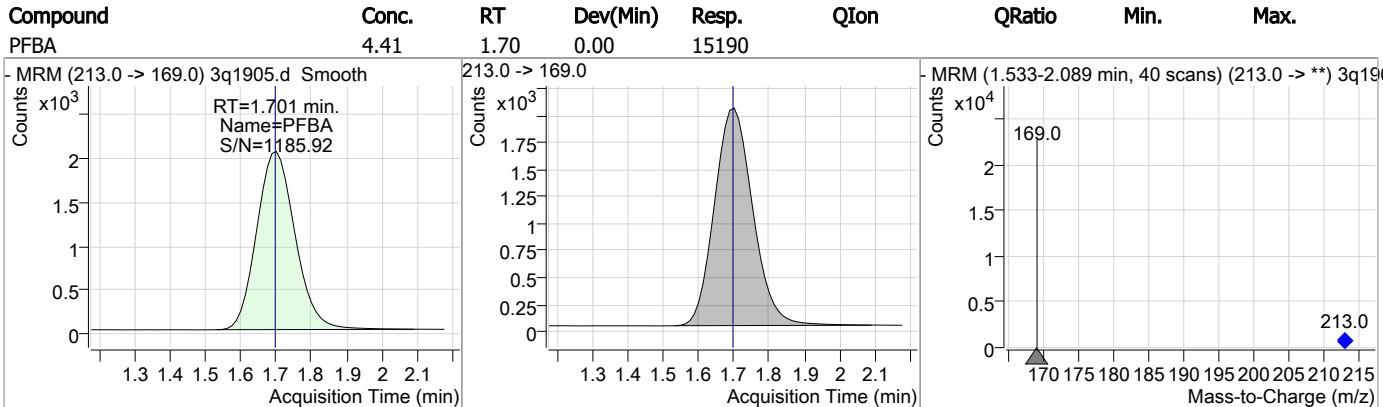
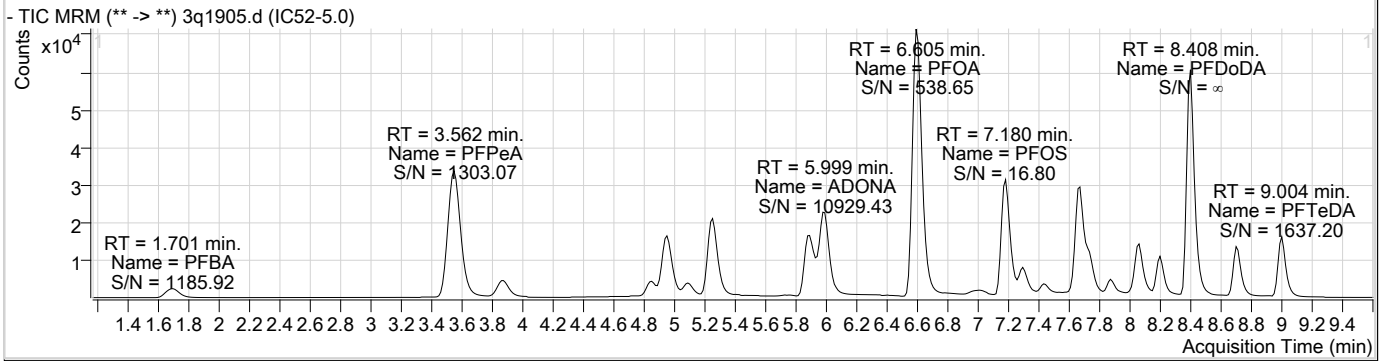
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.4

7

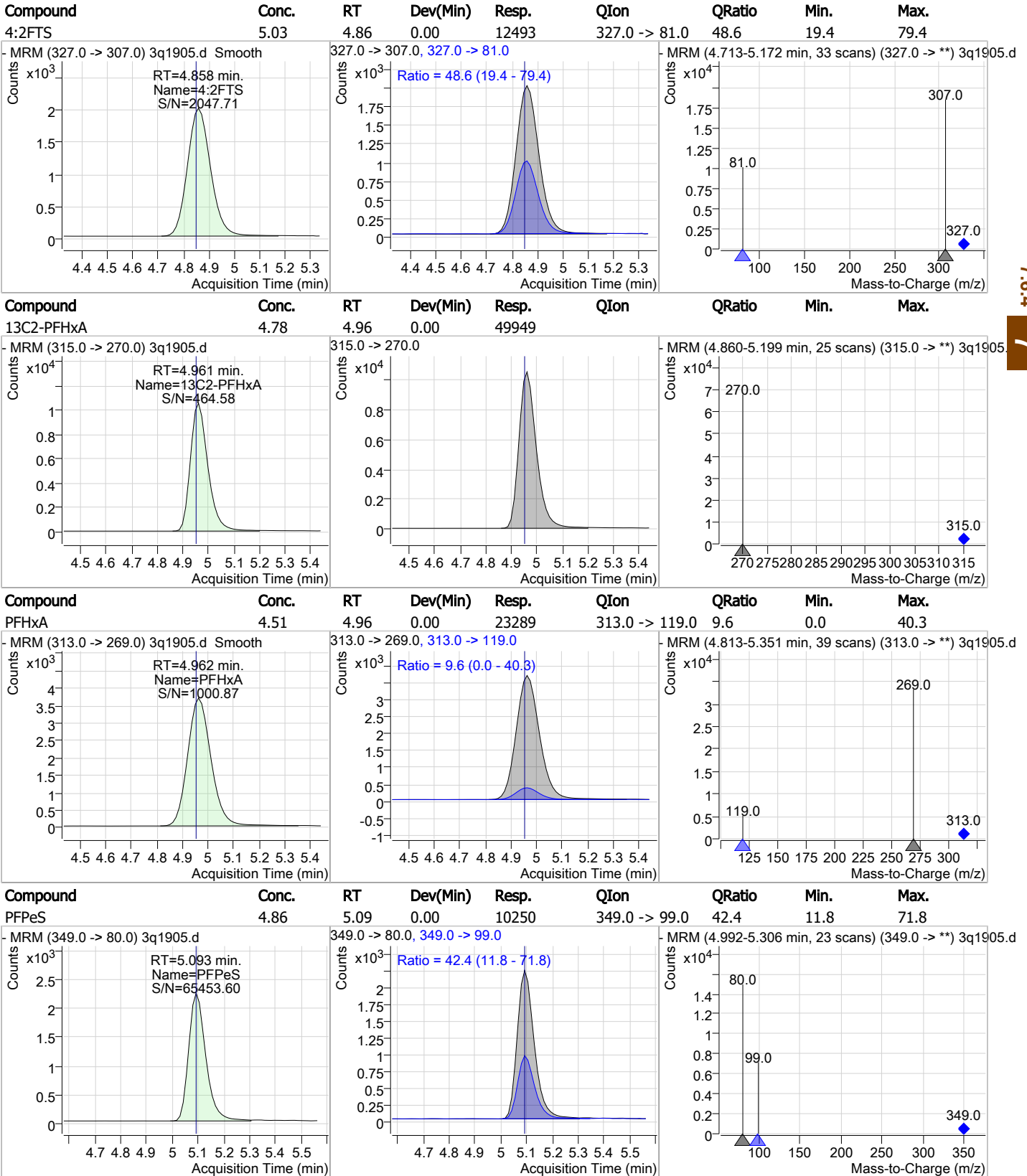
Perfluorinated Compounds by LC/MS/MS



7.6.4
7



Perfluorinated Compounds by LC/MS/MS

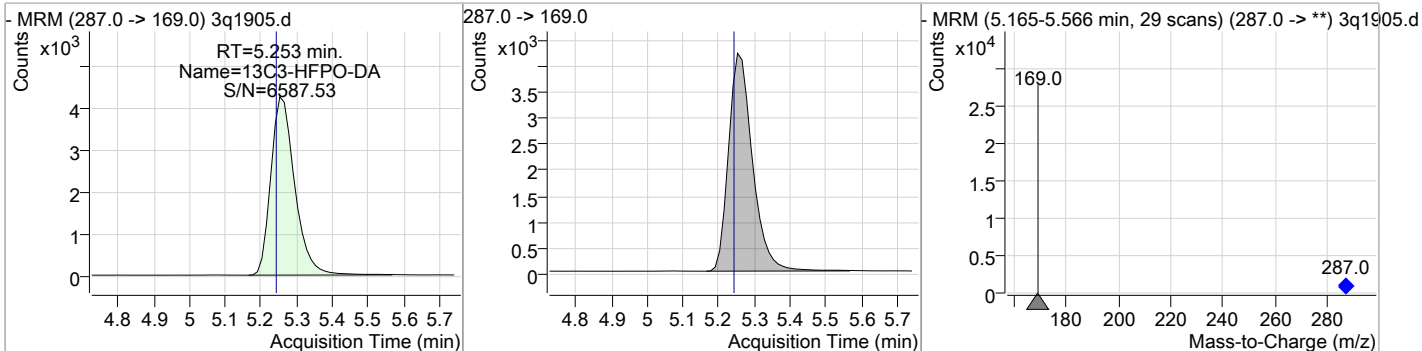


7.6.4

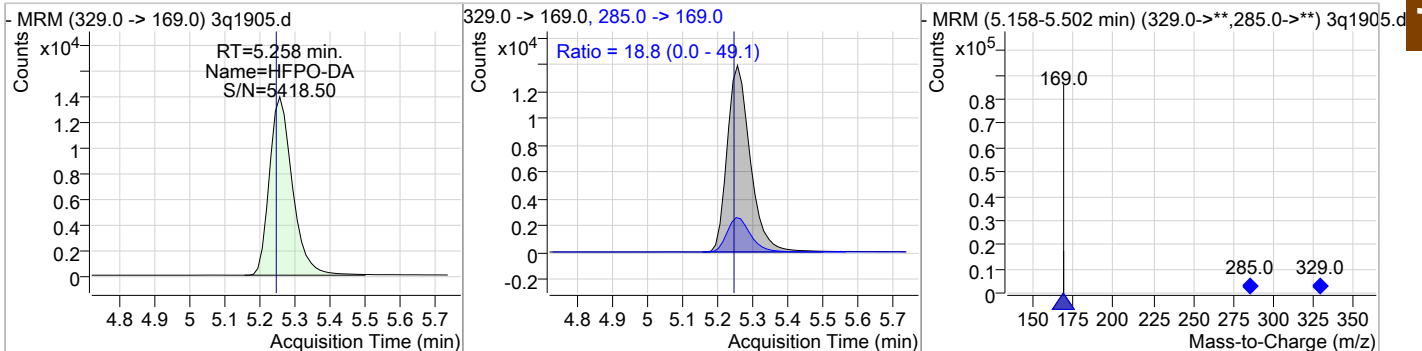
7

Perfluorinated Compounds by LC/MS/MS

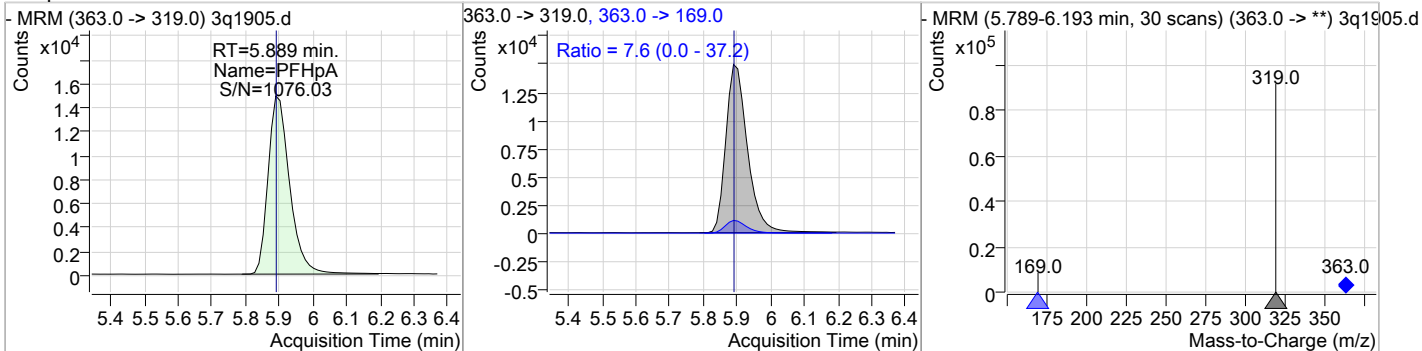
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



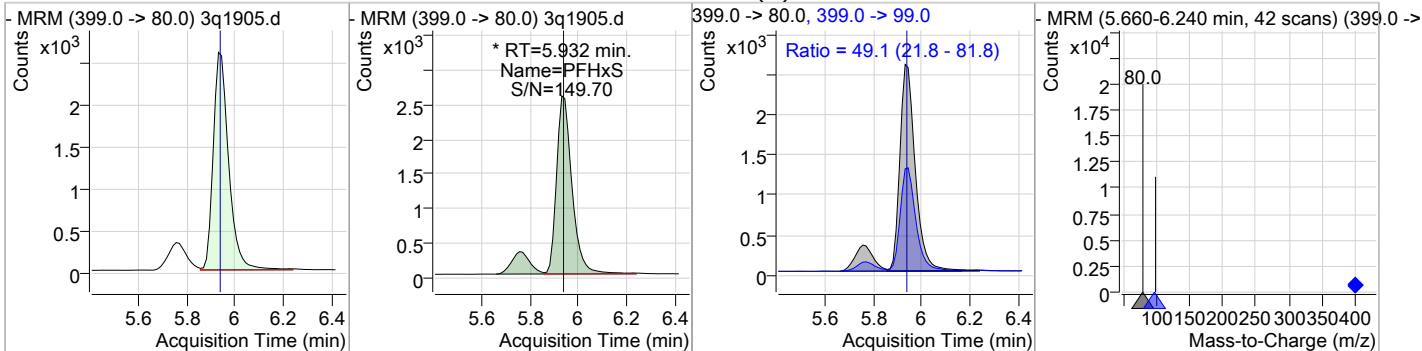
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

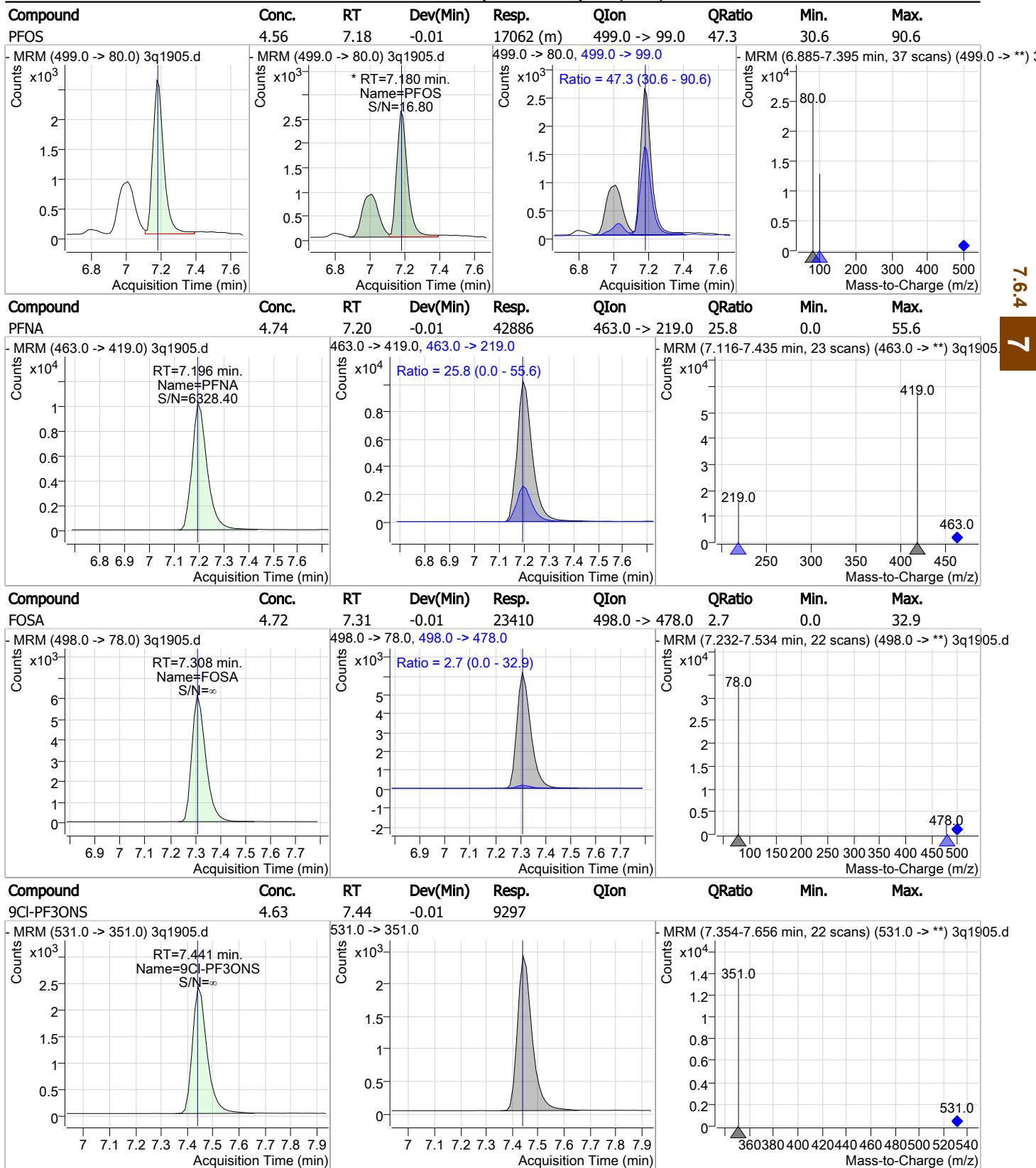


Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
ADONA	4.52	6.00	0.00	92811				
6:2FTS	5.05	6.59	-0.01	10467	427.0 -> 81.0	48.4	17.4	77.4
PFOA	4.68	6.61	-0.01	39518	413.0 -> 169.0	34.7	5.1	65.1
PFHpS	4.81	6.62	0.00	11784	449.0 -> 99.0	49.3	18.6	78.6

7.6.4
7

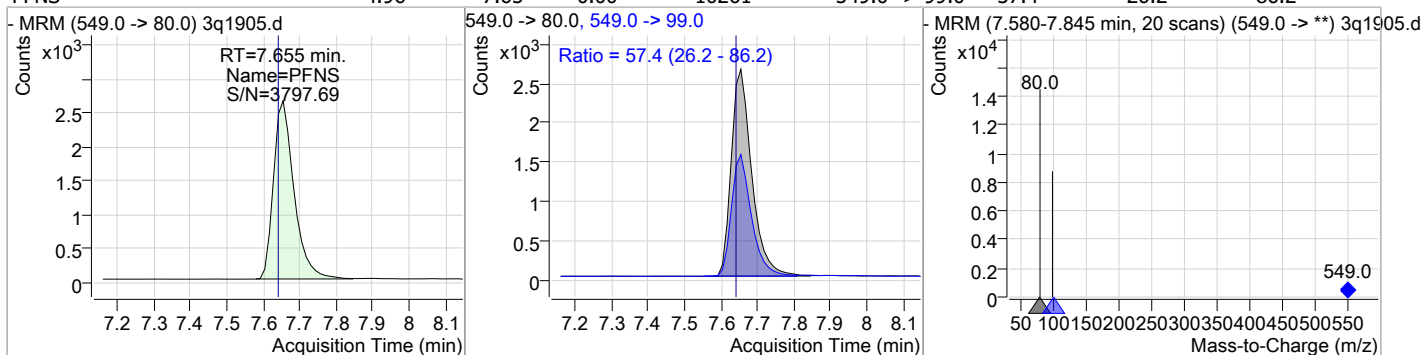
Perfluorinated Compounds by LC/MS/MS



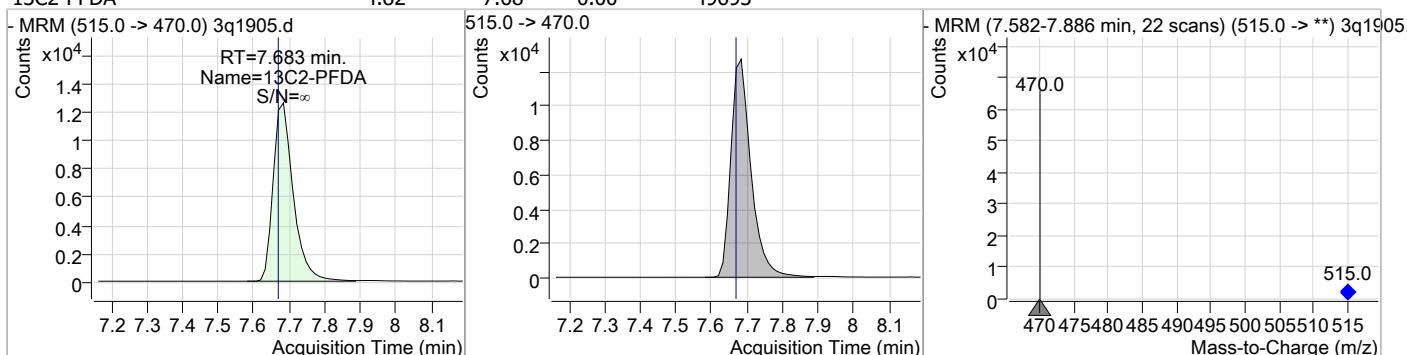
7.6.4
7

Perfluorinated Compounds by LC/MS/MS

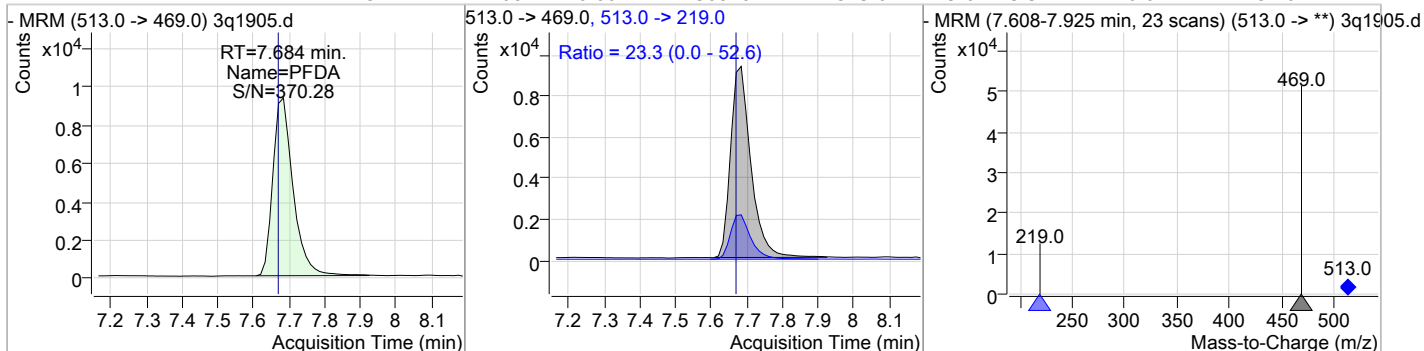
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	4.96	7.65	0.00	10261	549.0 -> 99.0	57.4	26.2	86.2



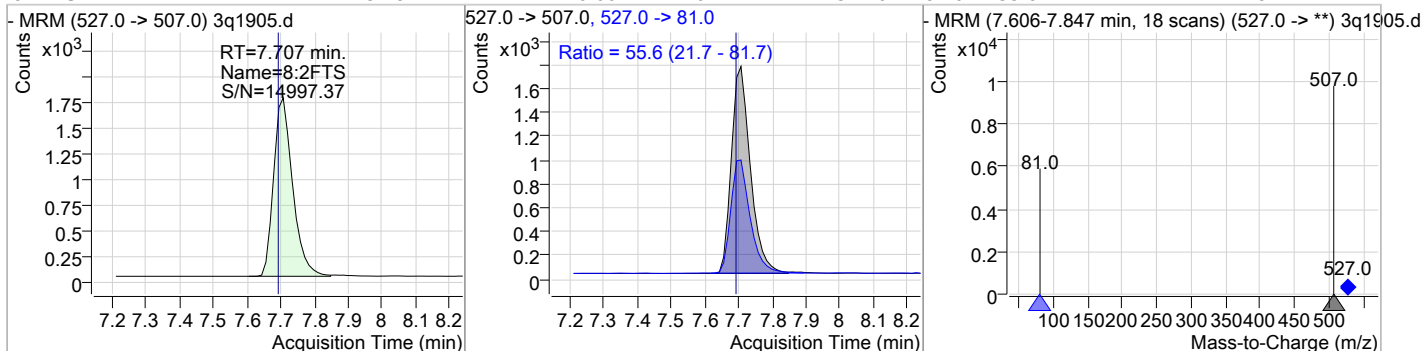
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	4.82	7.68	0.00	49693				



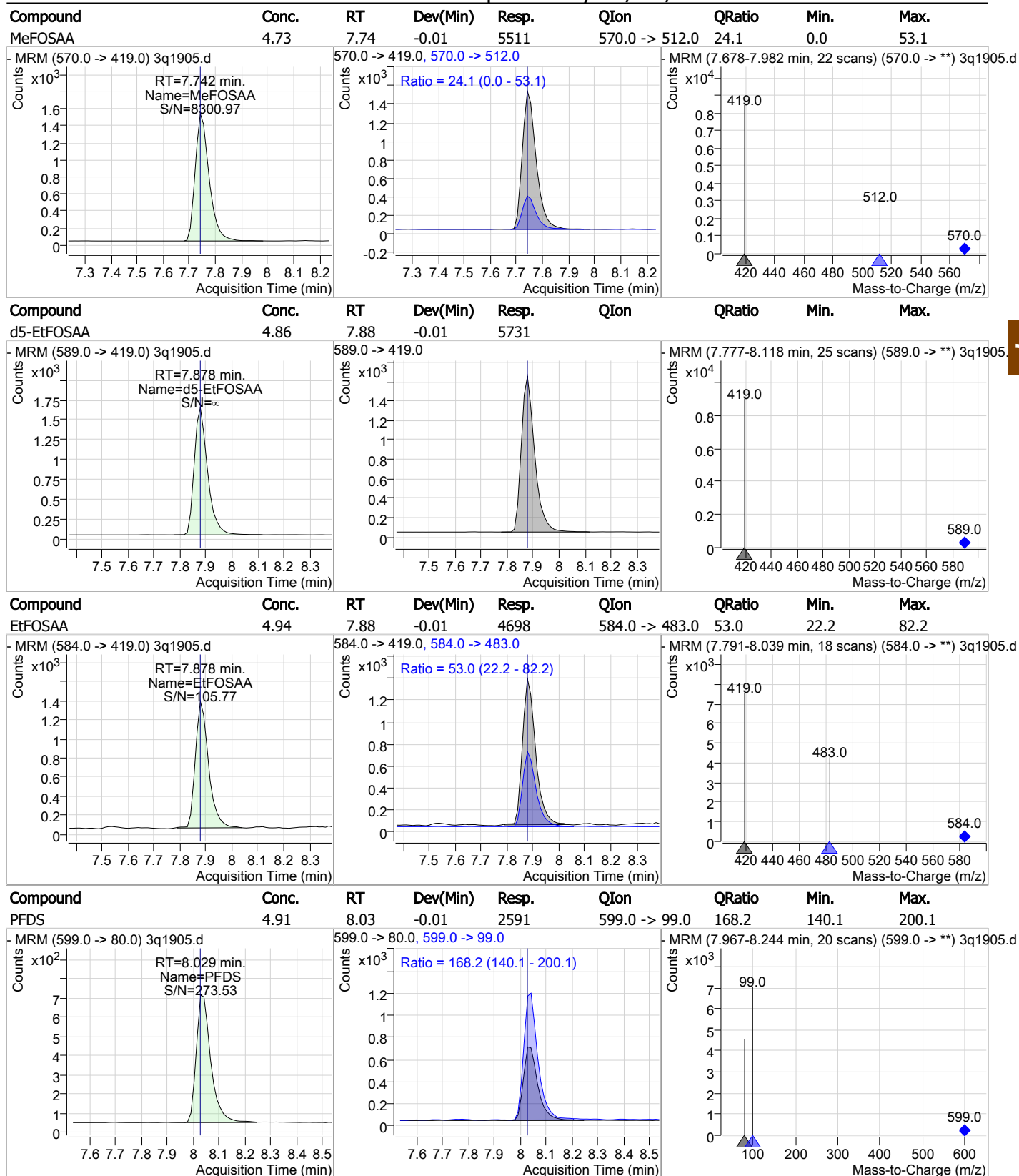
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	5.11	7.68	0.00	36848	513.0 -> 219.0	23.3	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	5.18	7.71	0.00	6774	527.0 -> 81.0	55.6	21.7	81.7



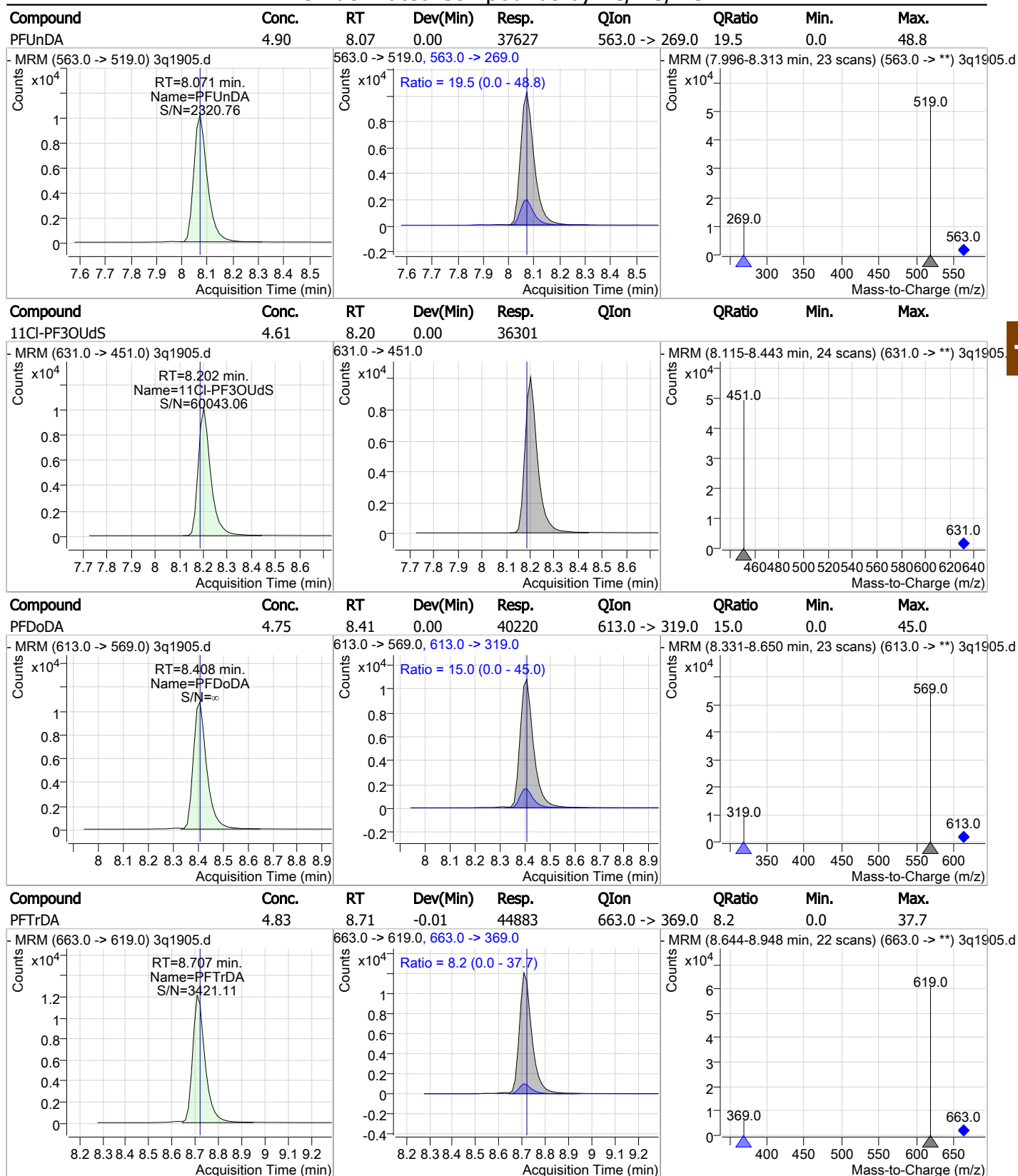
Perfluorinated Compounds by LC/MS/MS



7.6.4

7

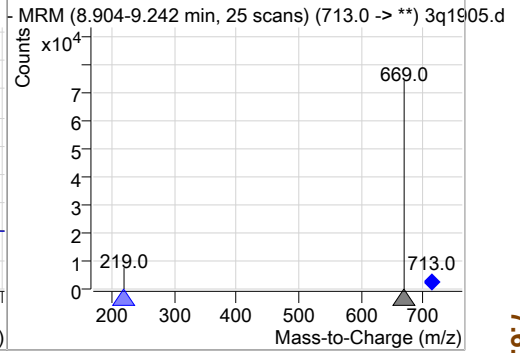
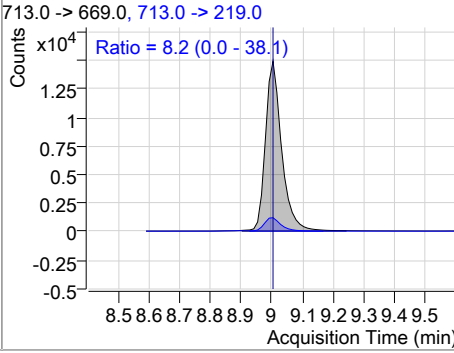
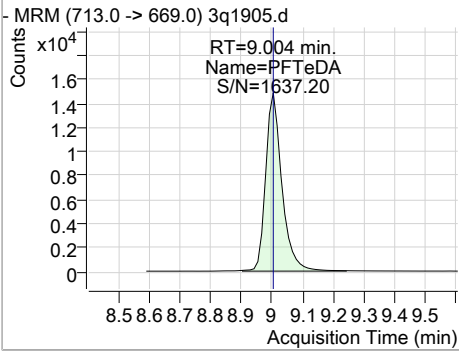
Perfluorinated Compounds by LC/MS/MS



7.6.4
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	4.92	9.00	0.00	54421	713.0 -> 219.0	8.2	0.0	38.1



7.6.4
7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1905.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 13:19 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak

7.6.4.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/18/19 13:49

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1906.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 1:35:09 PM
 Sample Name : IC52-10
 Vial : P1-A6
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	40519	20.00 µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	178245	20.00 µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	191245	20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	151513	20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	61343	20.00 µg/L	0.000
d3-MeFOSAA	7.741	573.0 -> 419.0	19757	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	101589	9.89 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 49.4%	
13C2-PFHxA	4.961	315.0 -> 270.0	102253	9.74 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 48.7%	
d5-EtFOSAA	7.878	589.0 -> 419.0	11826	10.36 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 51.8%	
13C3-HFPO-DA	5.253	287.0 -> 169.0	39370	50.53 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 50.5%	
Target Compounds					
4:2FTS	4.858	327.0 -> 307.0	25950	10.20 µg/L	QValue 98
6:2FTS	6.601	427.0 -> 407.0	21022	9.90 µg/L	96
8:2FTS	7.707	527.0 -> 507.0	13809	10.31 µg/L	95
EtFOSAA	7.891	584.0 -> 419.0	9594	10.42 µg/L	98
FOSA	7.321	498.0 -> 78.0	47610	9.99 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	11371	10.08 µg/L	99
PFBA	1.701	213.0 -> 169.0	31006	9.00 µg/L	100
PFBS	3.878	299.0 -> 80.0	34056	9.19 µg/L	98
PFDA	7.684	513.0 -> 469.0	75295	10.42 µg/L	99
PFDoDA	8.408	613.0 -> 569.0	83233	9.74 µg/L	100
PFDS	8.041	599.0 -> 80.0	5285	10.05 µg/L	98
PFHpA	5.902	363.0 -> 319.0	134500	9.36 µg/L	100
PFHpS	6.621	449.0 -> 80.0	23492	9.62 µg/L	99
PFHxA	4.962	313.0 -> 269.0	48524	9.38 µg/L	98
PFHxS	5.944	399.0 -> 80.0	26119	9.45 µg/L	m 97
PFNA	7.208	463.0 -> 419.0	86992	9.59 µg/L	99
PFNS	7.655	549.0 -> 80.0	20581	9.99 µg/L	98
PFOA	6.618	413.0 -> 369.0	81360	9.62 µg/L	98
PFOS	7.192	499.0 -> 80.0	34706	9.31 µg/L	m 83
PFPeA	3.562	263.0 -> 219.0	101963	9.58 µg/L	100
PFPeS	5.093	349.0 -> 80.0	20868	9.79 µg/L	98
PFTeDA	9.004	713.0 -> 669.0	112568	10.08 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	92936	9.91 µg/L	99
PFUnDA	8.071	563.0 -> 519.0	78487	10.14 µg/L	100
ADONA	5.999	377.0 -> 251.0	190499	9.27 µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	19091	9.49 µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	76024	9.64 µg/L	100
HFPO-DA	5.258	329.0 -> 169.0	127655	50.99 µg/L	99

7.65
7



Perfluorinated Compounds by LC/MS/MS

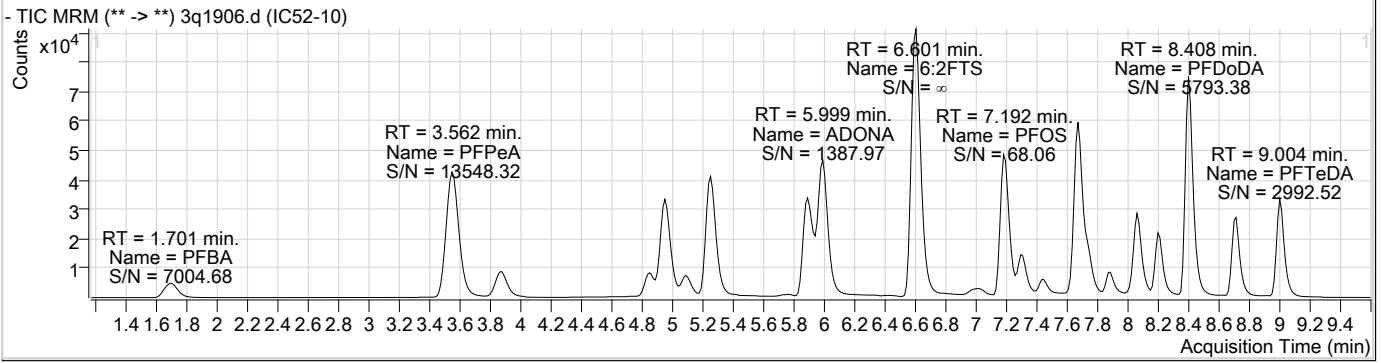
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

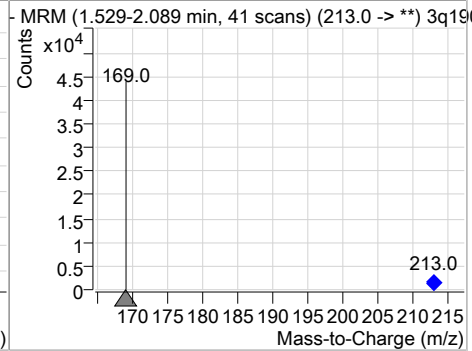
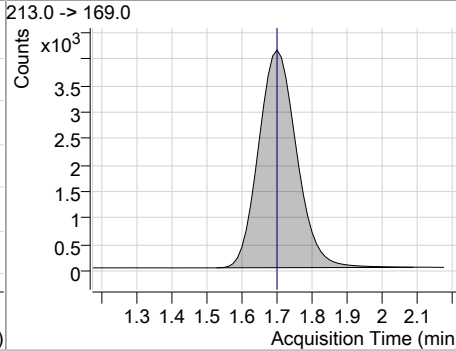
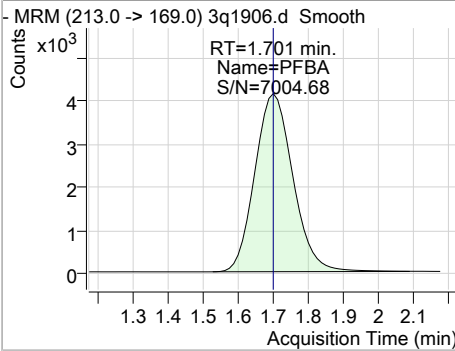
7.6.5

7

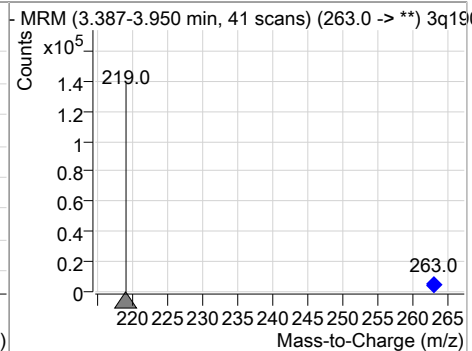
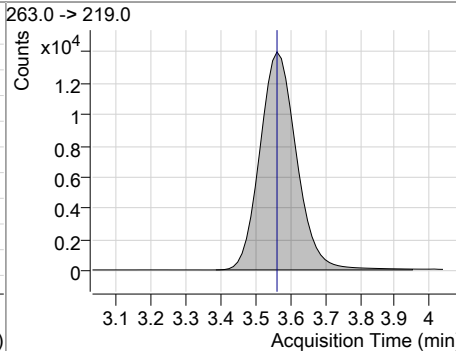
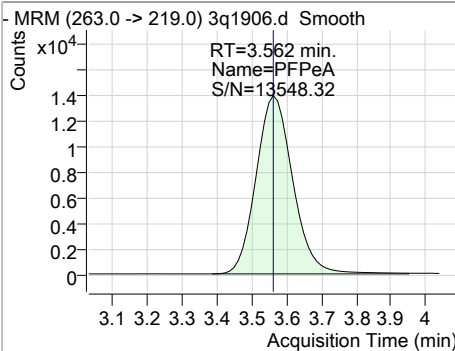
Perfluorinated Compounds by LC/MS/MS



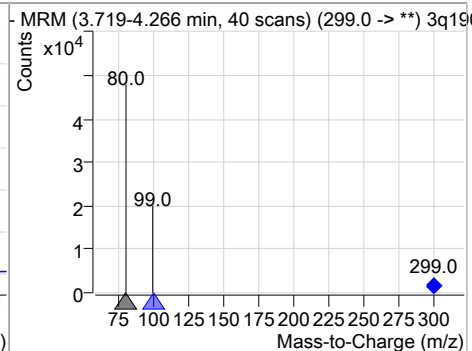
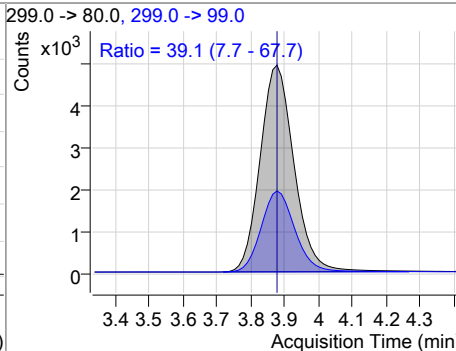
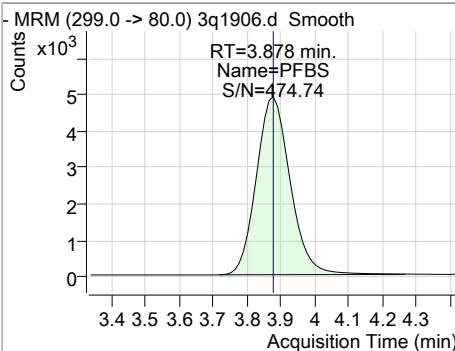
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	9.00	1.70	0.00	31006				



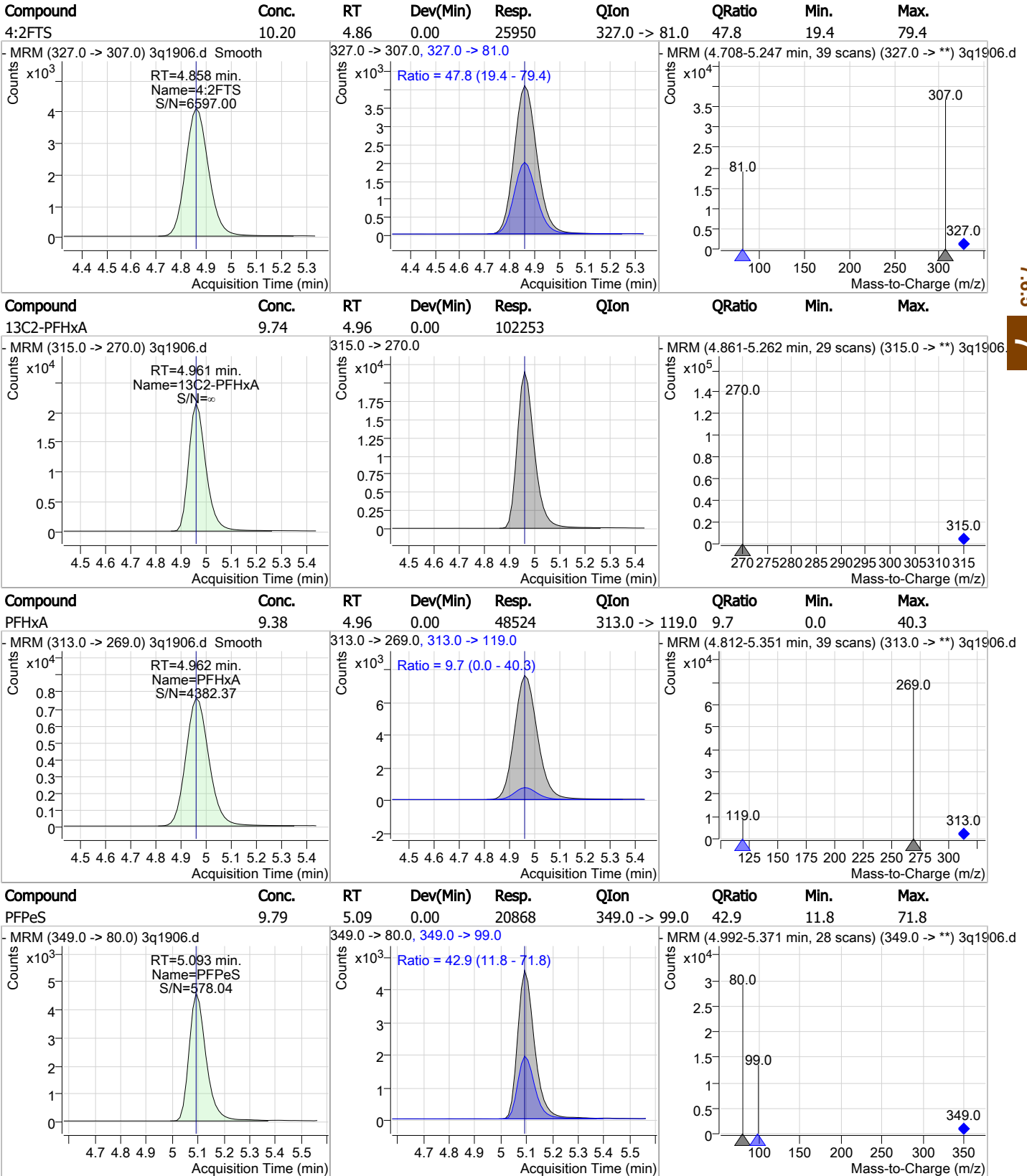
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	9.58	3.56	0.00	101963				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	9.19	3.88	0.00	34056	299.0 -> 99.0	39.1	7.7	67.7



Perfluorinated Compounds by LC/MS/MS



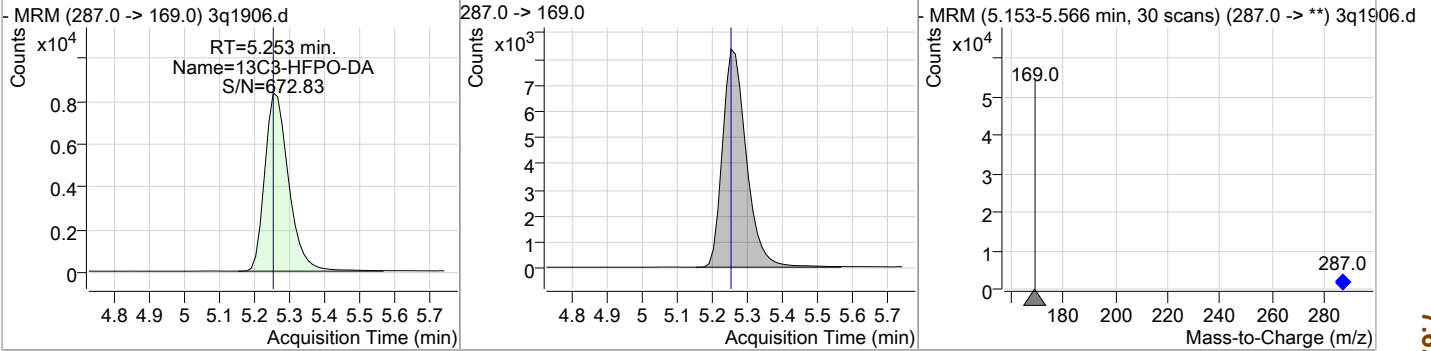
7.6.5

7

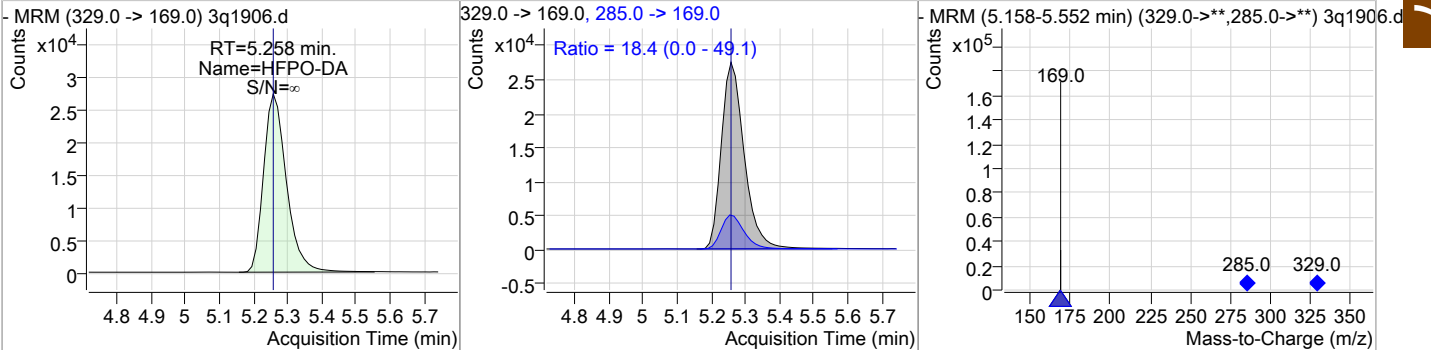


Perfluorinated Compounds by LC/MS/MS

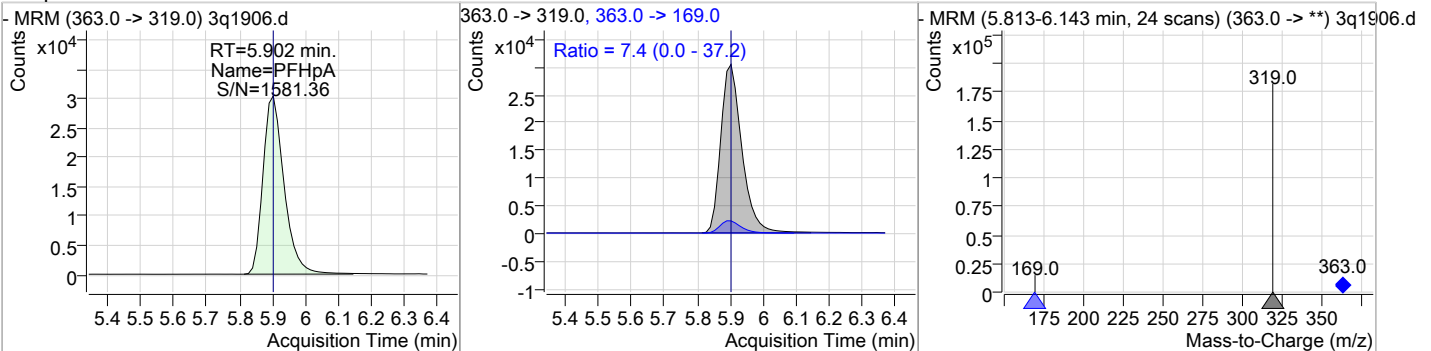
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	50.53	5.25	0.00	39370				



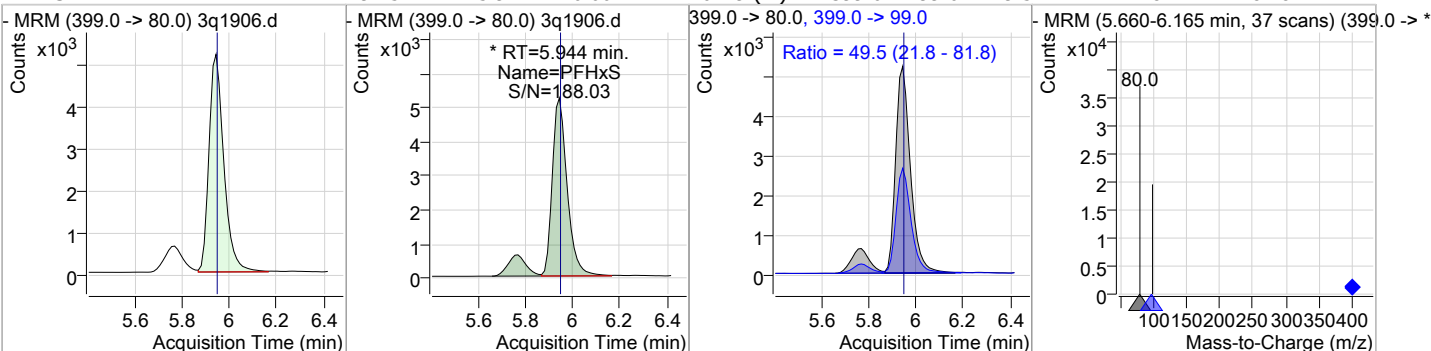
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	50.99	5.26	0.00	127655	285.0 -> 169.0	18.4	0.0	49.1



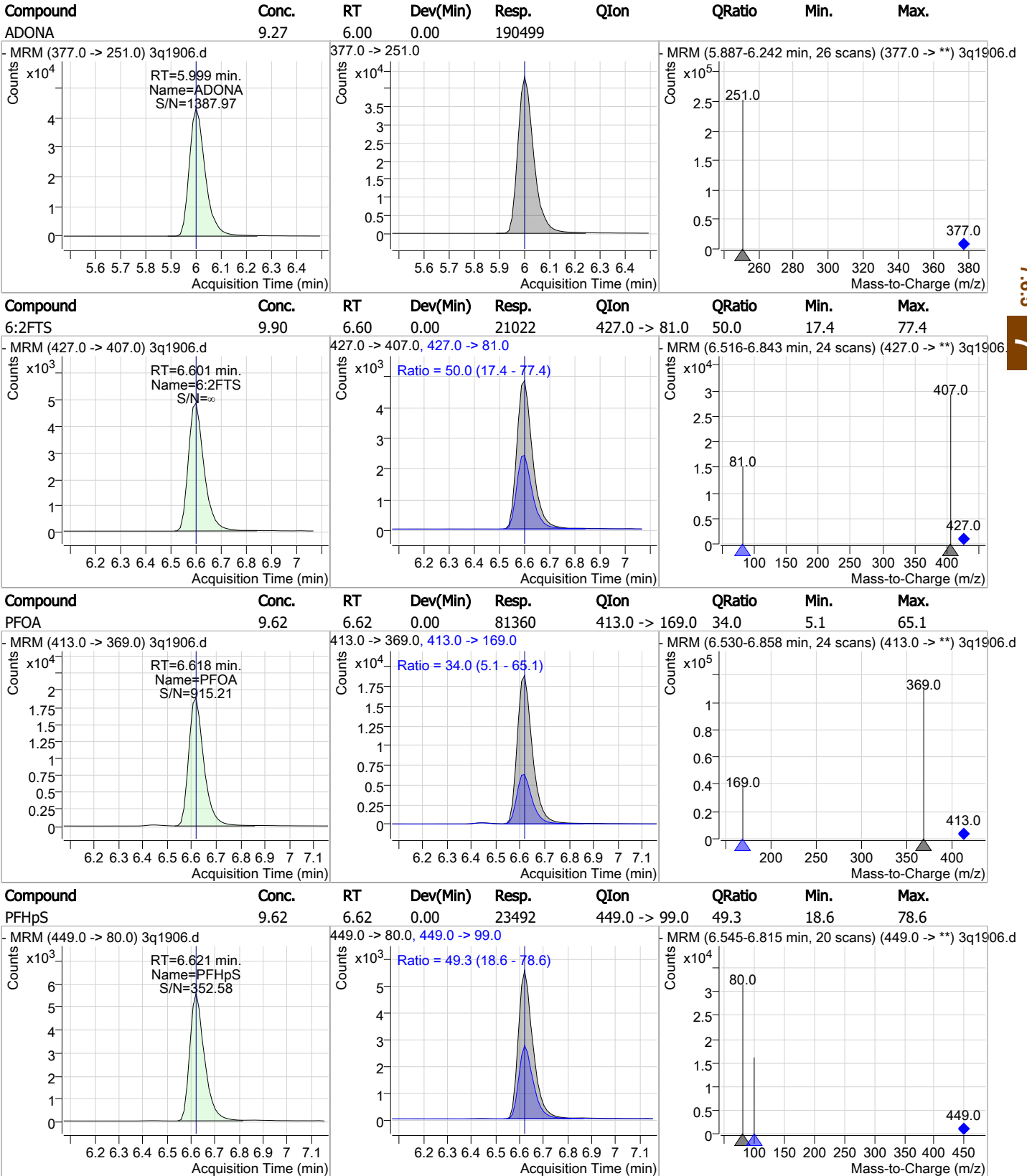
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	9.36	5.90	0.00	134500	363.0 -> 169.0	7.4	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	9.45	5.94	0.00	26119 (m)	399.0 -> 99.0	49.5	21.8	81.8



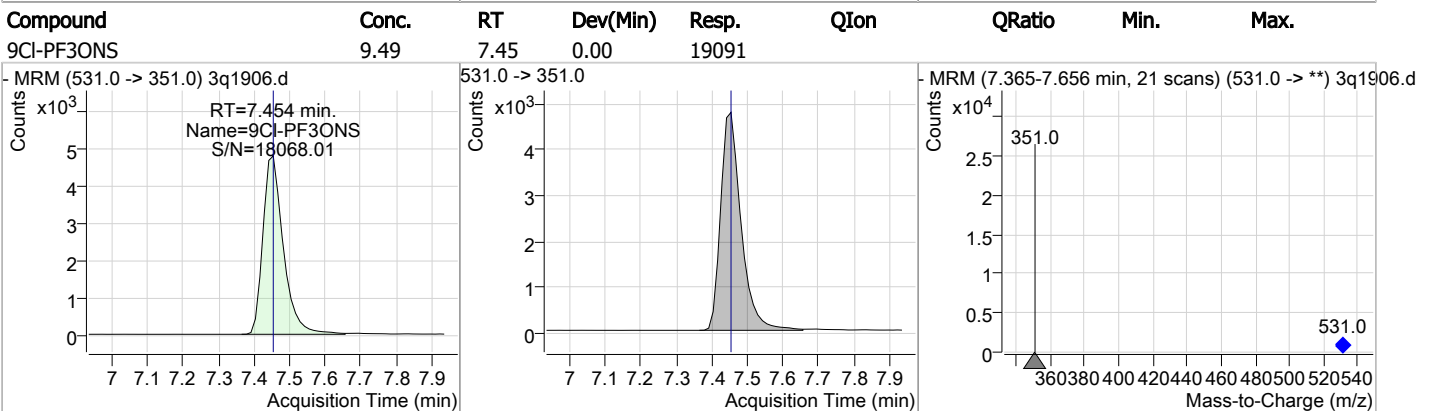
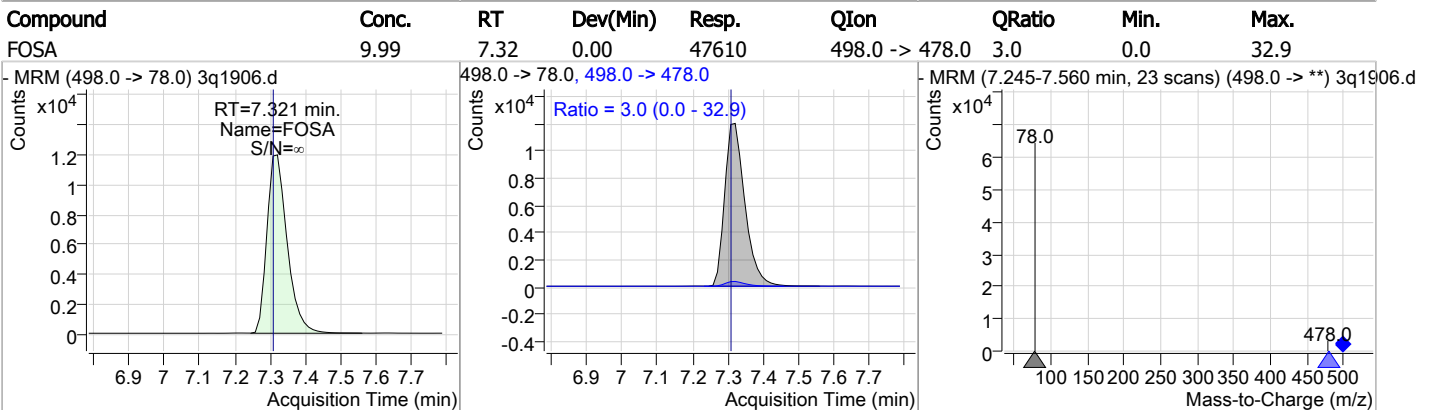
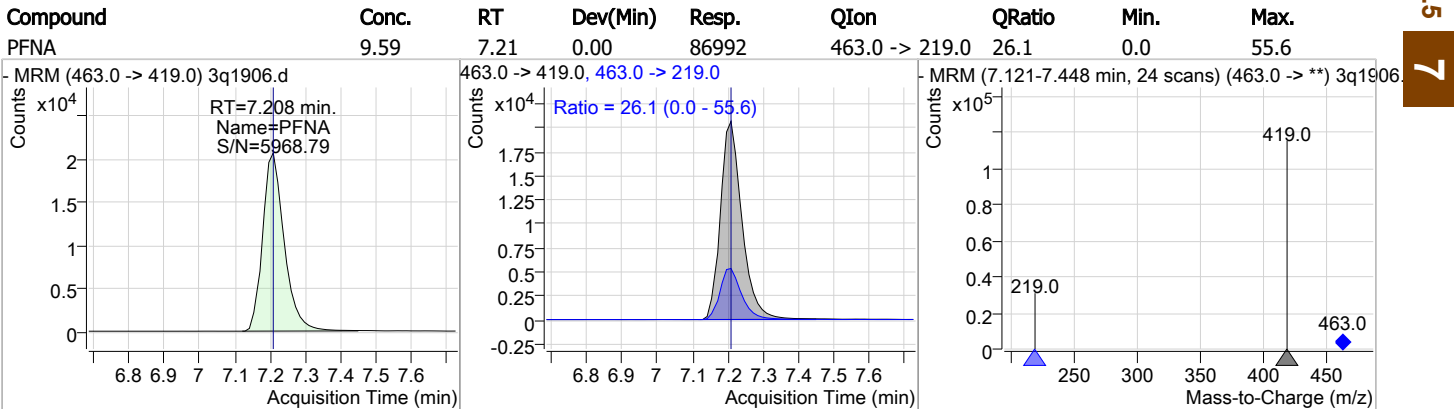
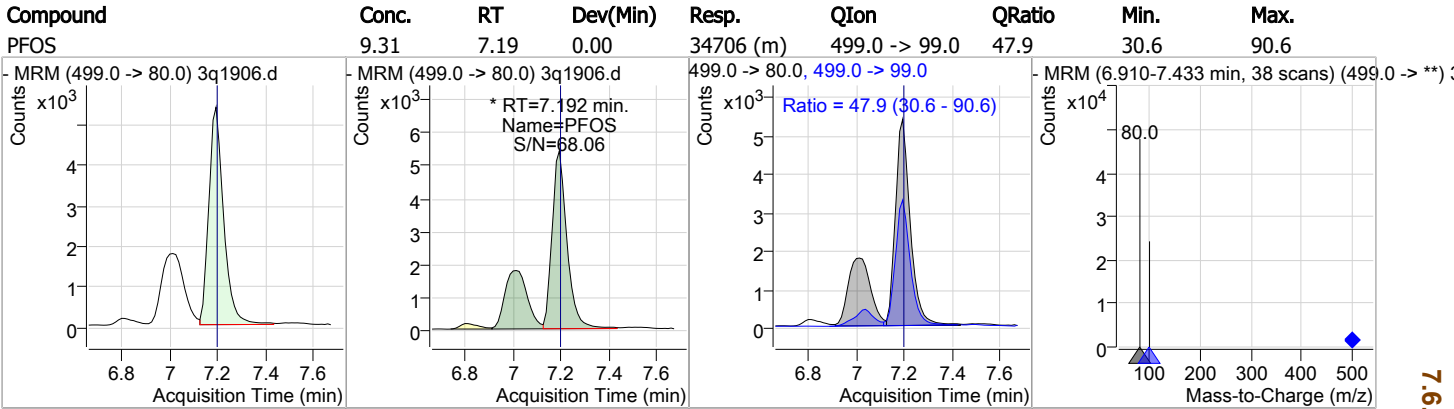
Perfluorinated Compounds by LC/MS/MS



7.6.5

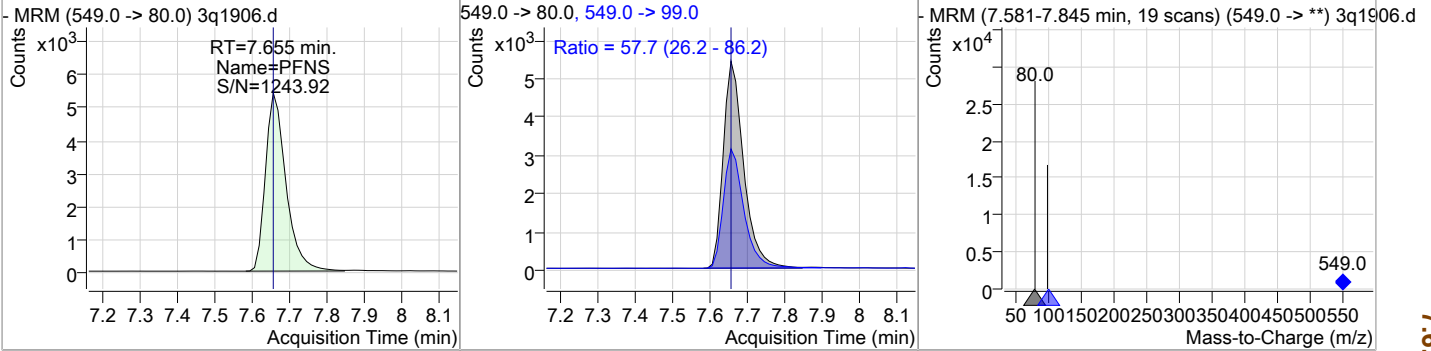
7

Perfluorinated Compounds by LC/MS/MS

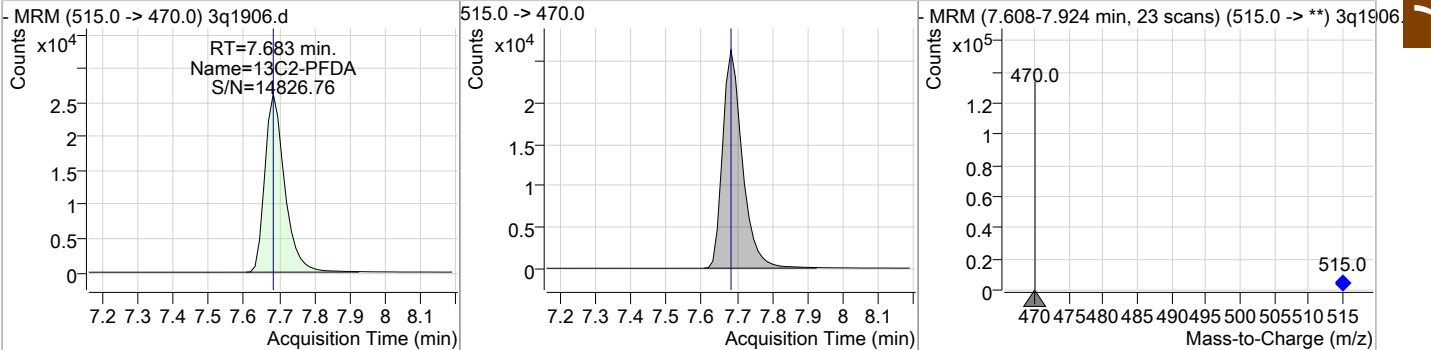


Perfluorinated Compounds by LC/MS/MS

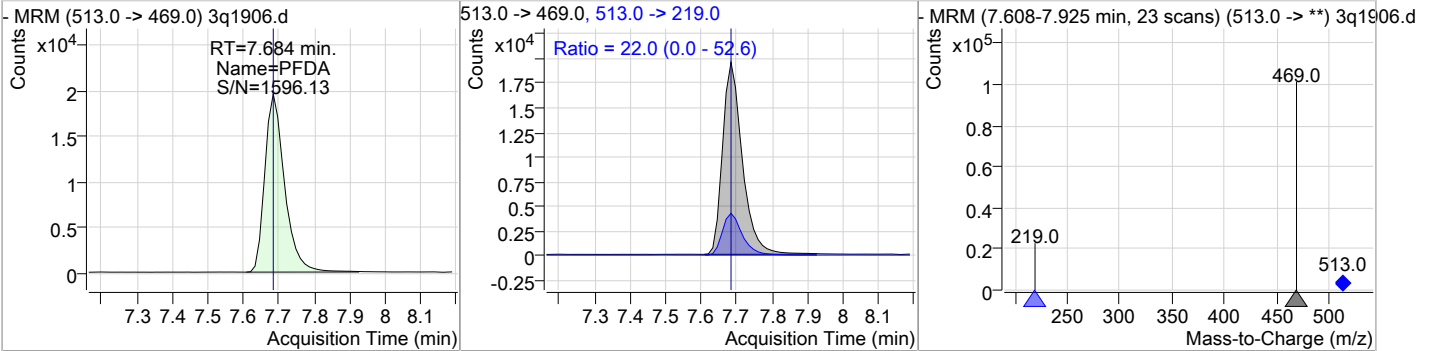
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	9.99	7.65	0.00	20581	549.0 -> 99.0	57.7	26.2	86.2



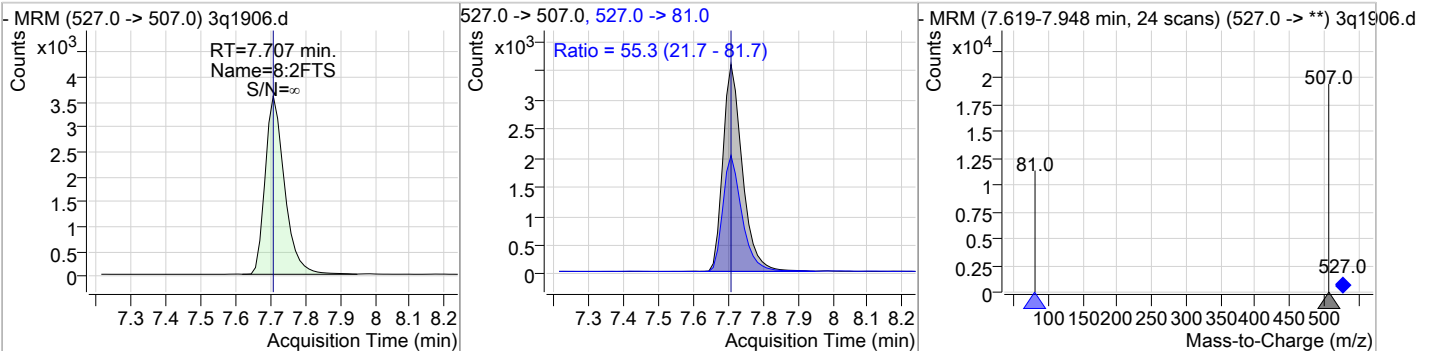
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	9.89	7.68	0.00	101589				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	10.42	7.68	0.00	75295	513.0 -> 219.0	22.0	0.0	52.6

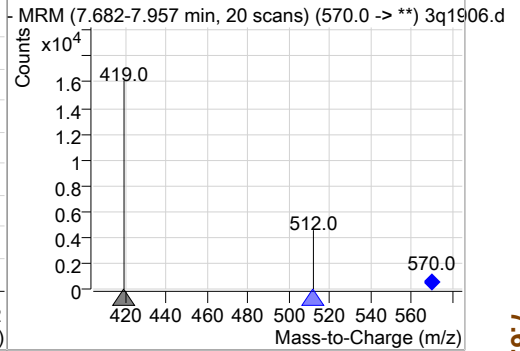
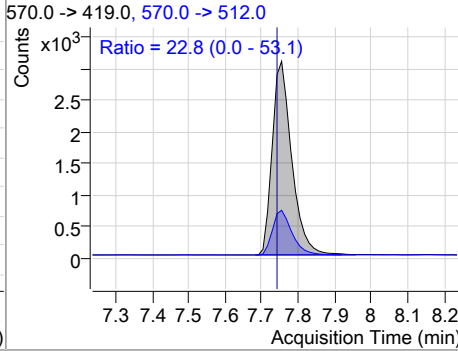
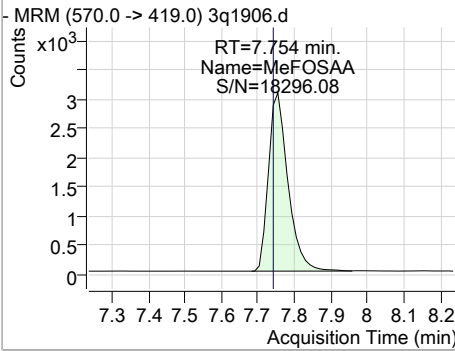


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	10.31	7.71	0.00	13809	527.0 -> 81.0	55.3	21.7	81.7

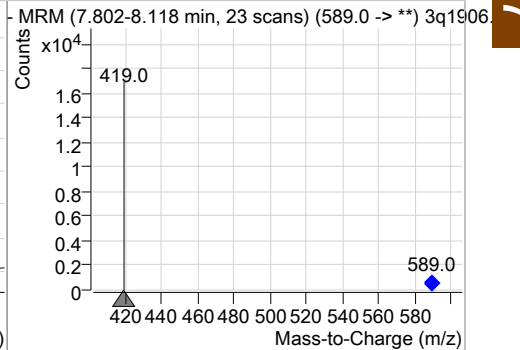
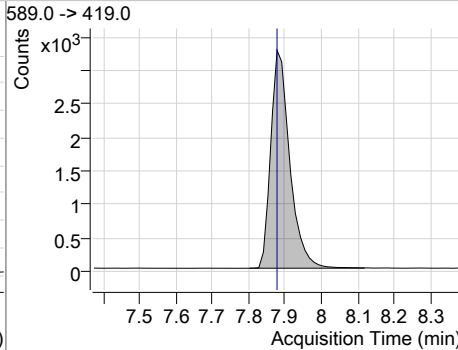
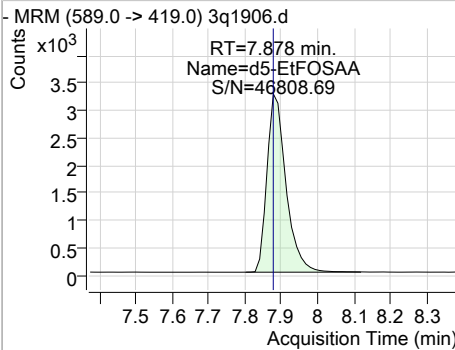


Perfluorinated Compounds by LC/MS/MS

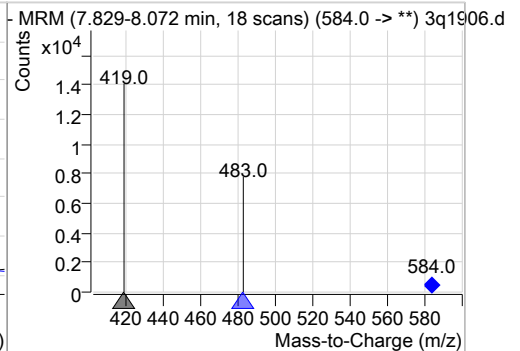
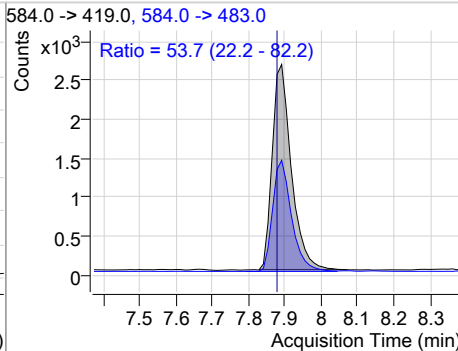
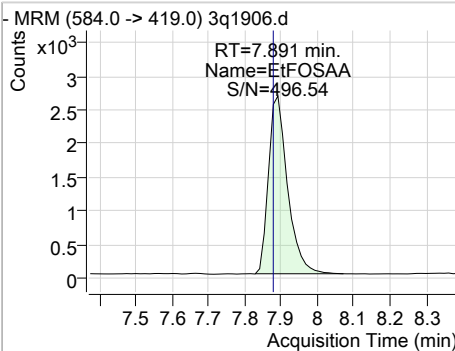
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	10.08	7.75	0.00	11371	570.0 -> 512.0	22.8	0.0	53.1



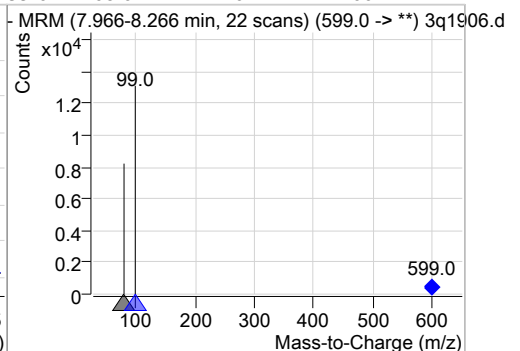
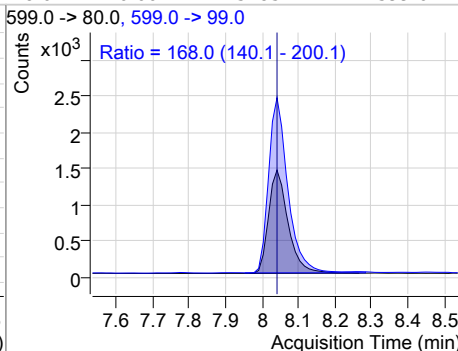
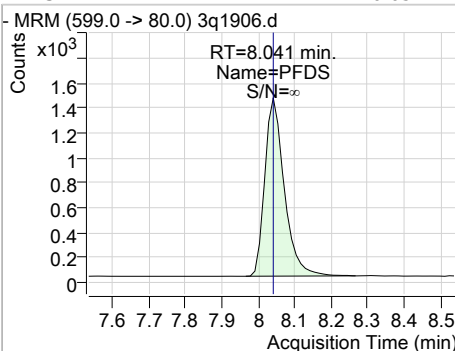
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	10.36	7.88	-0.01	11826	589.0 -> 419.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	10.42	7.89	0.00	9594	584.0 -> 483.0	53.7	22.2	82.2

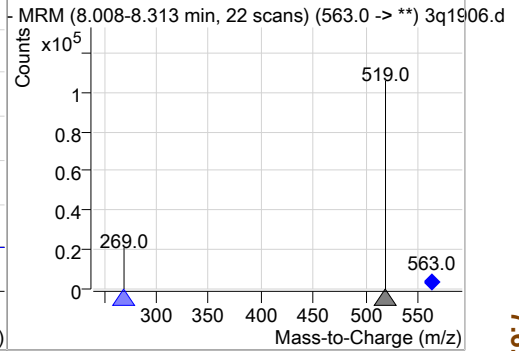
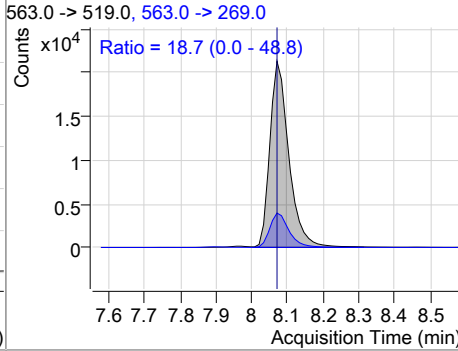
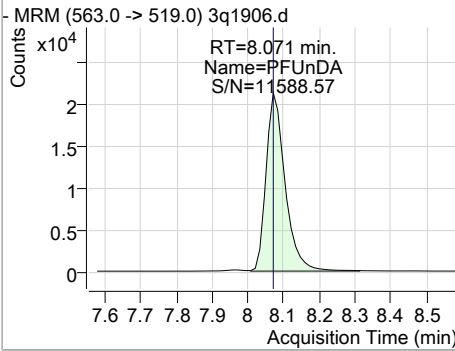


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	10.05	8.04	0.00	5285	599.0 -> 99.0	168.0	140.1	200.1

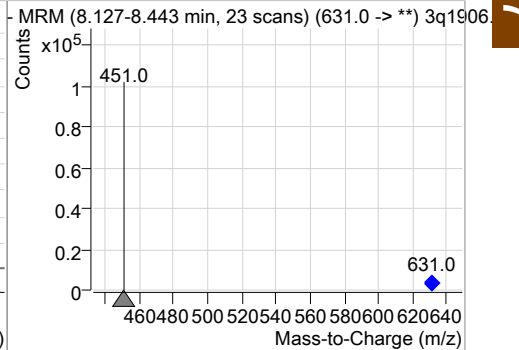
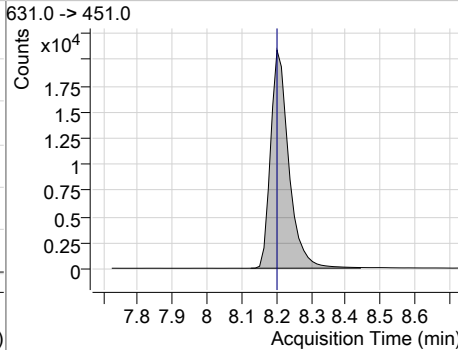
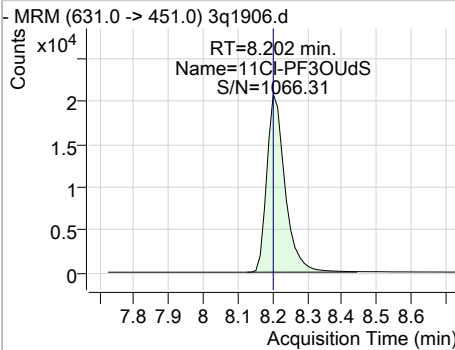


Perfluorinated Compounds by LC/MS/MS

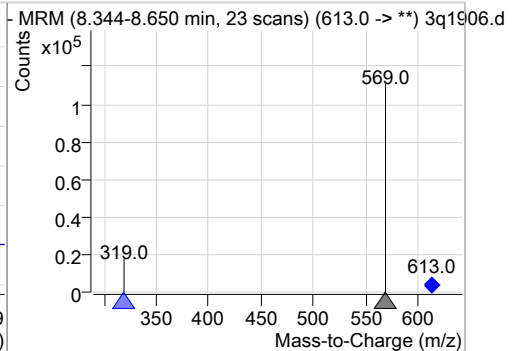
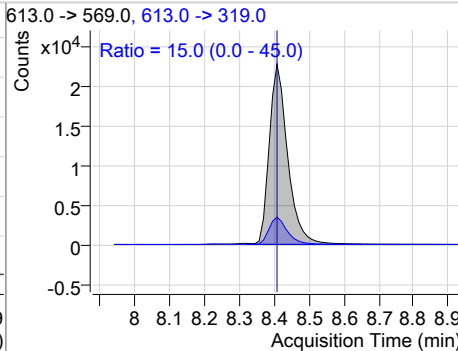
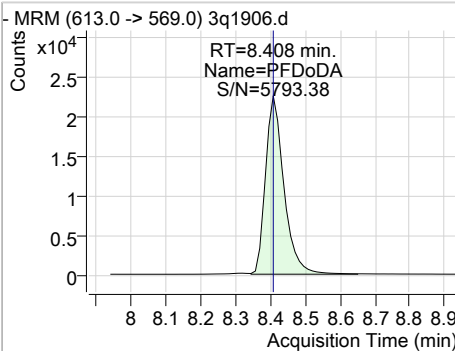
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	10.14	8.07	0.00	78487	563.0 -> 269.0	18.7	0.0	48.8



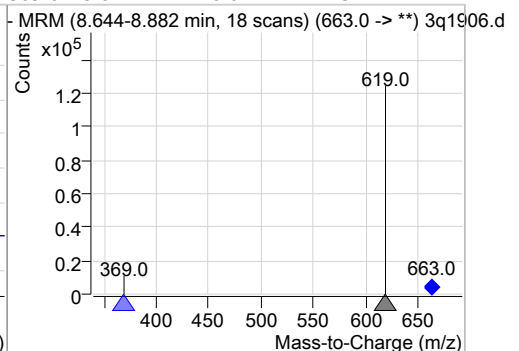
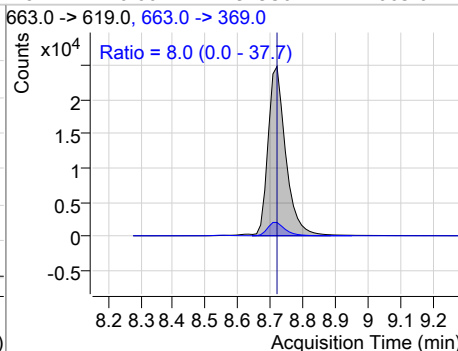
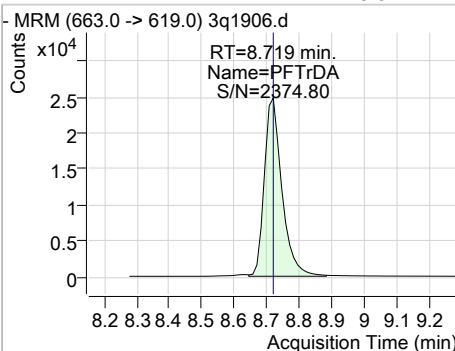
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	9.64	8.20	0.00	76024	631.0 -> 451.0	15.0	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	9.74	8.41	0.00	83233	613.0 -> 319.0	8.0	0.0	37.7



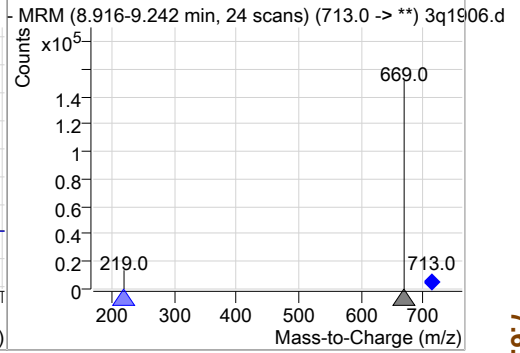
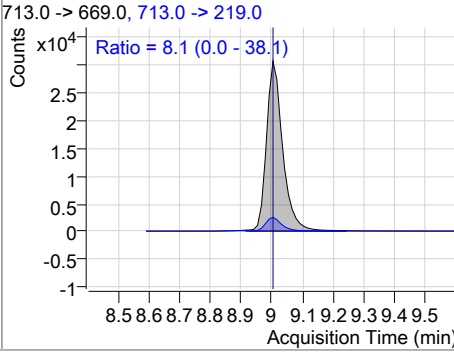
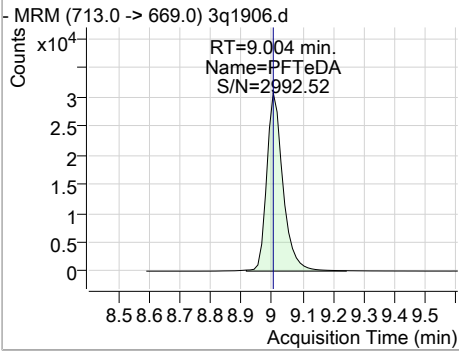
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	9.91	8.72	0.00	92936	663.0 -> 369.0	8.0	0.0	37.7



7.6.5
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	10.08	9.00	0.00	112568	713.0 -> 219.0	8.1	0.0	38.1



7.6.5
7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1906.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 13:35 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.5.1

7

Manual Integrations
APPROVED
(compounds with "m" flag)

Norman Farmer
03/18/19 13:49

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1907.d
Operator : nancyf
Acq. Method : 537_LIST_GENX.m
Acq. Date-Time : 3/15/2019 1:50:29 PM
Sample Name : ICC52-20
Vial : P1-A7
DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
Batch Name : S3Q52.batch.bin
Sample Information : op74124,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Symmetry	Conc. Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	39408		20.00 µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	169251		20.00 µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	180561		20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	144511		20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	57568		20.00 µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	19018		20.00 µg/L	0.000
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	189028		19.63 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 98.2%	
13C2-PFHxA	4.961	315.0 -> 270.0	195095		19.58 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 97.9%	
d5-EtFOSAA	7.890	589.0 -> 419.0	22387		20.38 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 101.9%	
13C3-HFPO-DA	5.253	287.0 -> 169.0	72937		100.00 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%				Recovery = 100.0%	
Target Compounds						
4:2FTS	4.858	327.0 -> 307.0	48815	1.26	19.73 µg/L	QValue 99
6:2FTS	6.601	427.0 -> 407.0	40275		19.51 µg/L	97
8:2FTS	7.707	527.0 -> 507.0	25854		19.85 µg/L	93
EtFOSAA	7.891	584.0 -> 419.0	17944		20.24 µg/L	100
FOSA	7.321	498.0 -> 78.0	90434		19.97 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	21343		19.65 µg/L	99
PFBA	1.701	213.0 -> 169.0	59950	1.22	18.42 µg/L	100
PFBS	3.878	299.0 -> 80.0	65639	1.16	18.87 µg/L	98
PFDA	7.684	513.0 -> 469.0	140802		20.64 µg/L	99
PFDoDA	8.408	613.0 -> 569.0	159222		19.61 µg/L	99
PFDS	8.041	599.0 -> 80.0	10227		20.73 µg/L	94
PFHpA	5.902	363.0 -> 319.0	257289		18.96 µg/L	99
PFHpS	6.621	449.0 -> 80.0	44997		19.64 µg/L	98
PFHxA	4.962	313.0 -> 269.0	92097	1.31	18.86 µg/L	98
PFHxS	5.944	399.0 -> 80.0	51160		19.72 µg/L	m 96
PFNA	7.208	463.0 -> 419.0	164901		19.26 µg/L	99
PFNS	7.655	549.0 -> 80.0	39118		20.23 µg/L	97
PFOA	6.618	413.0 -> 369.0	154442		19.34 µg/L	99
PFOS	7.192	499.0 -> 80.0	67207		19.22 µg/L	m 82
PFPeA	3.562	263.0 -> 219.0	196474	1.25	19.36 µg/L	100
PFPeS	5.093	349.0 -> 80.0	39924		19.64 µg/L	99
PFTeDA	9.004	713.0 -> 669.0	207124		19.53 µg/L	99
PFTrDA	8.719	663.0 -> 619.0	176026		19.76 µg/L	99
PFUnDA	8.071	563.0 -> 519.0	148777		20.24 µg/L	99
ADONA	5.999	377.0 -> 251.0	364444		18.78 µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	36168		19.04 µg/L	100
11Cl-PF3OUds	8.202	631.0 -> 451.0	144365		19.39 µg/L	100
HFPO-DA	5.258	329.0 -> 169.0	236125		100.74 µg/L	99

7.6.6

7

Perfluorinated Compounds by LC/MS/MS

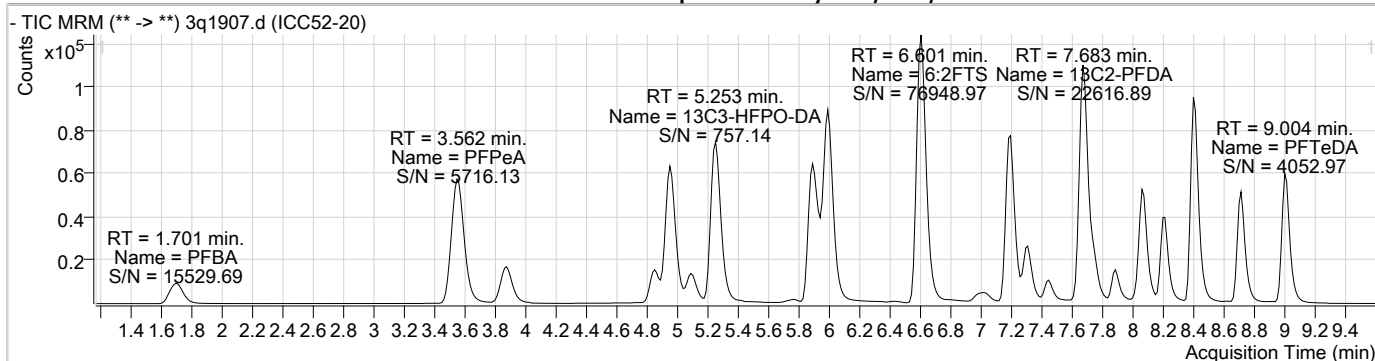
Compound	RT	QIon	Resp.	Symmetry	Conc. Units	Dev(Min)
----------	----	------	-------	----------	-------------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

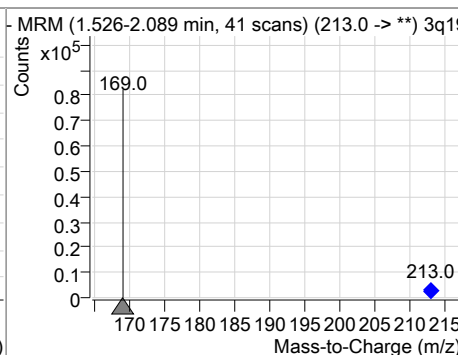
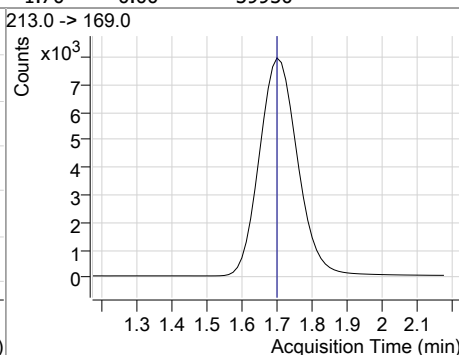
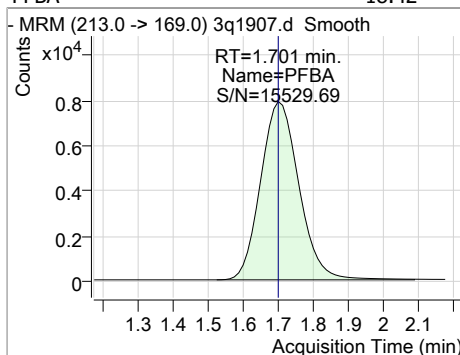
7.6.6

7

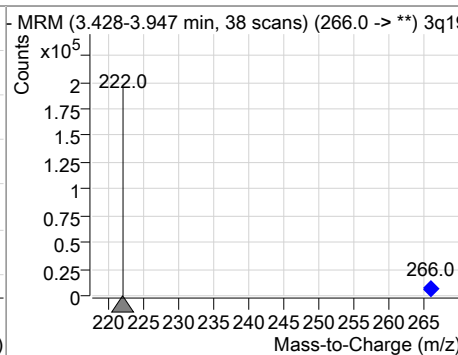
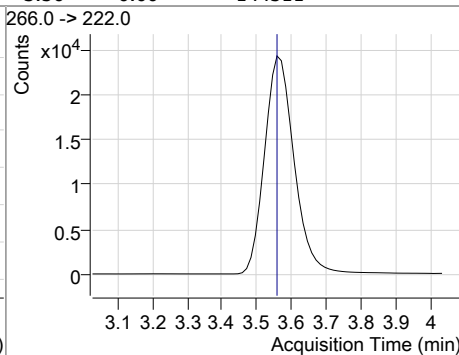
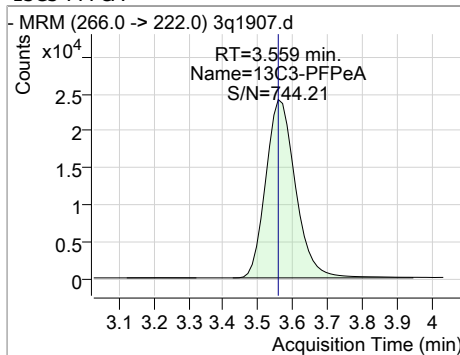
Perfluorinated Compounds by LC/MS/MS



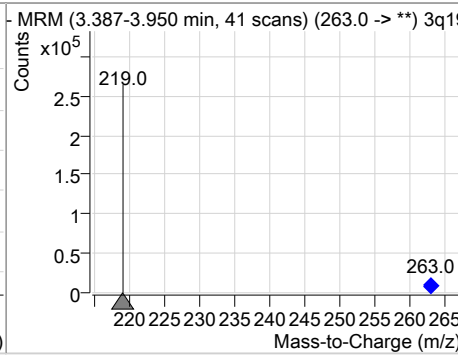
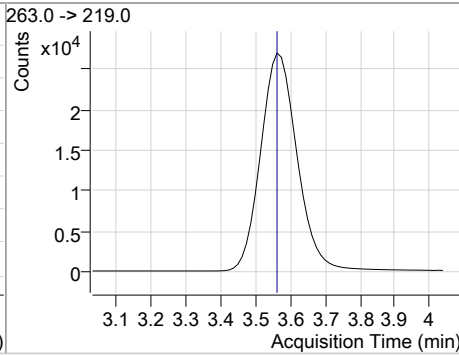
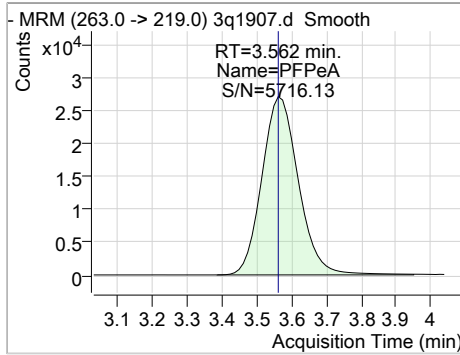
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	18.42	1.70	0.00	59950				



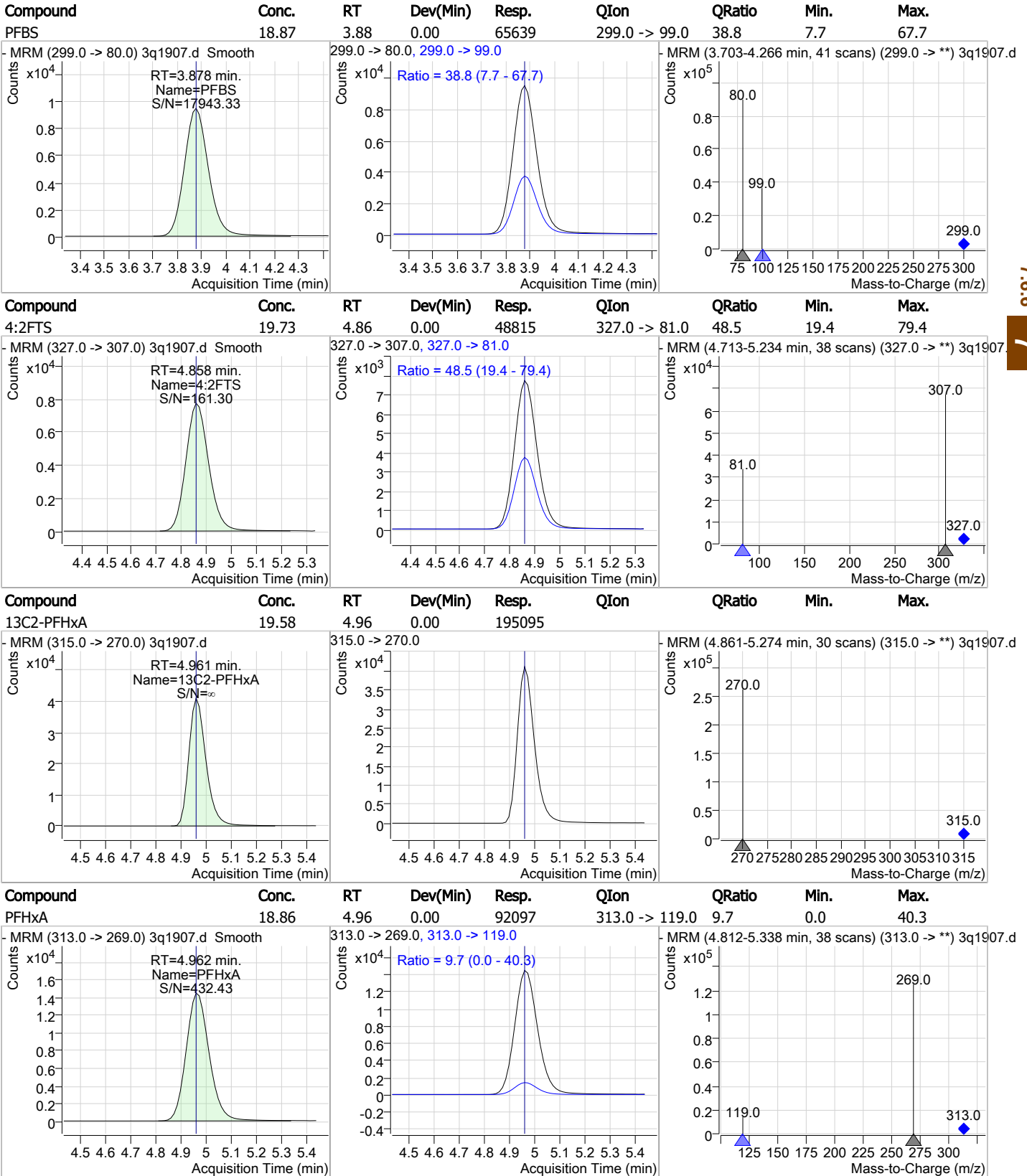
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-PFPeA		3.56	0.00	144511				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	19.36	3.56	0.00	196474				



Perfluorinated Compounds by LC/MS/MS

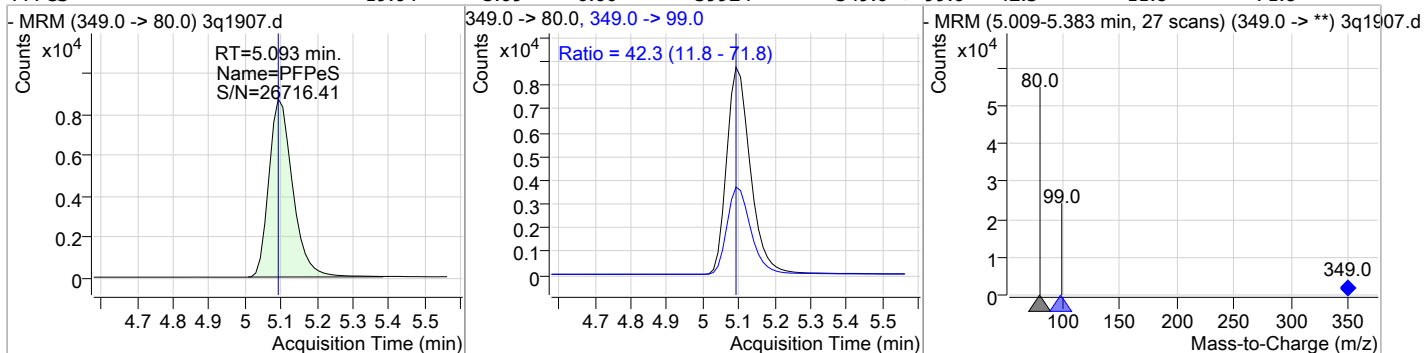


7.6.6

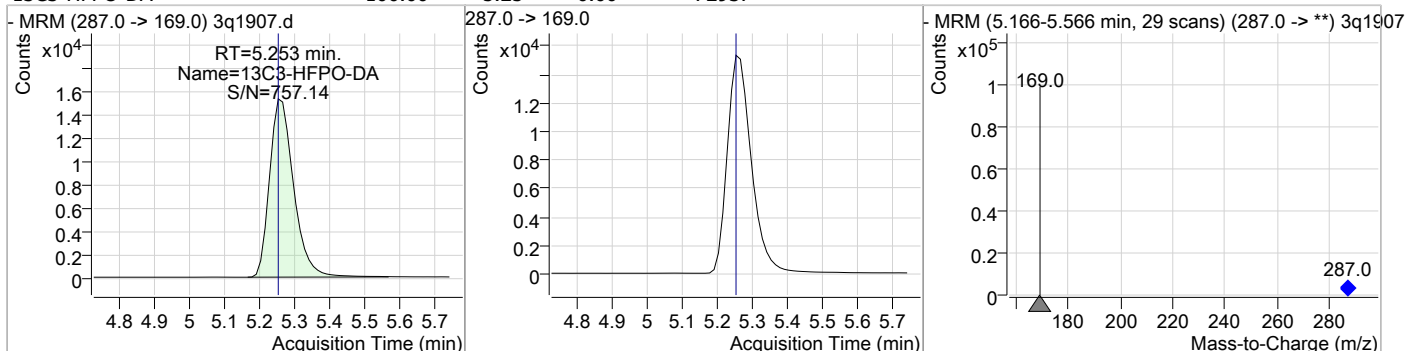
7

Perfluorinated Compounds by LC/MS/MS

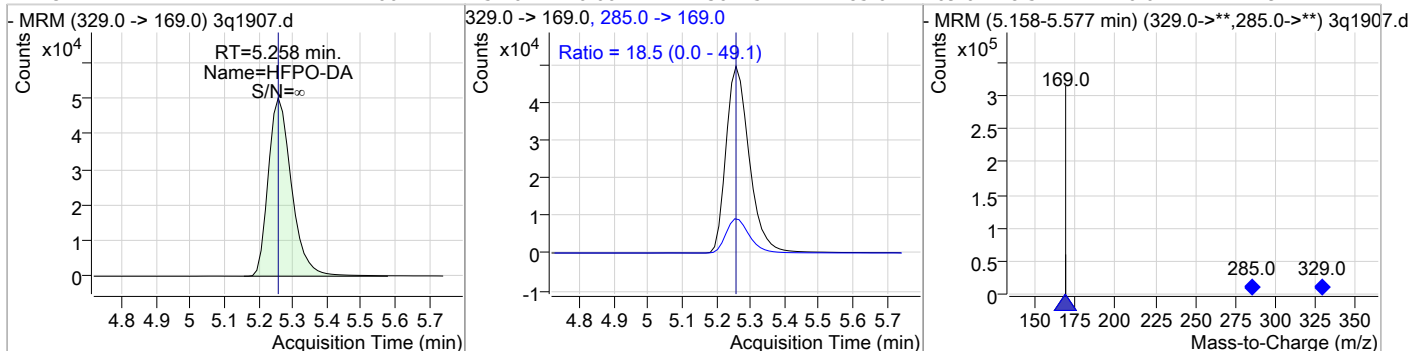
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.64	5.09	0.00	39924	349.0 -> 99.0	42.3	11.8	71.8



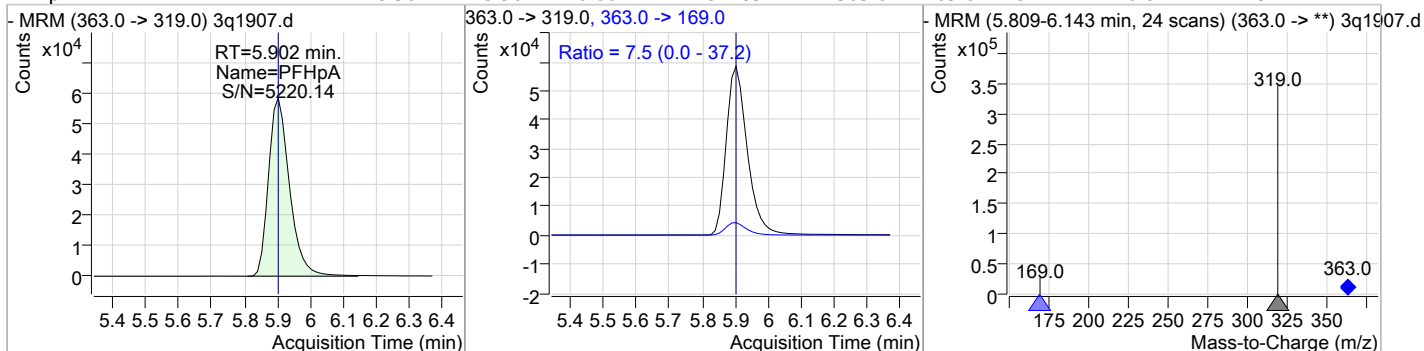
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	100.00	5.25	0.00	72937				



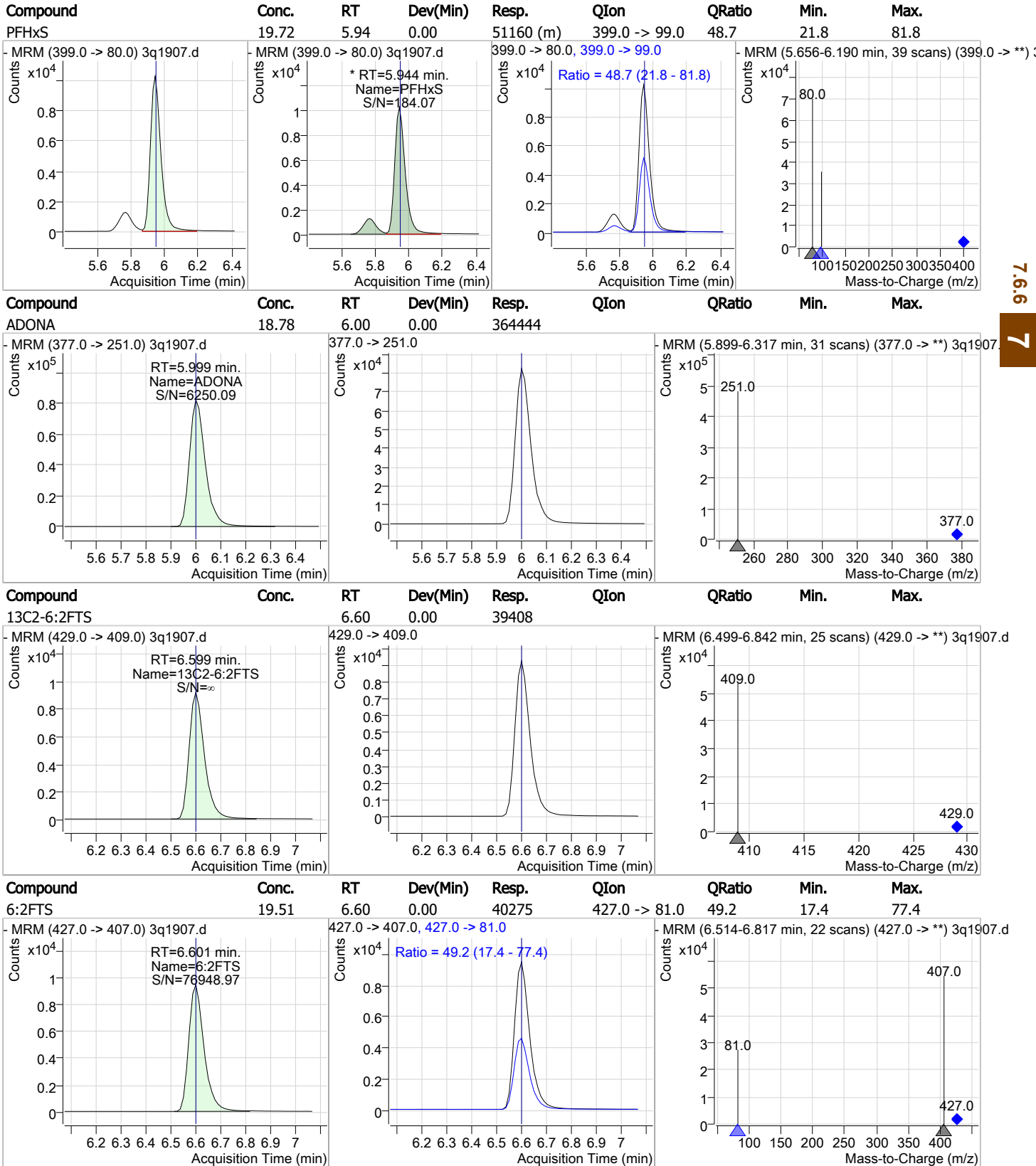
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	100.74	5.26	0.00	236125	285.0 -> 169.0	18.5	0.0	49.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	18.96	5.90	0.00	257289	363.0 -> 169.0	7.5	0.0	37.2



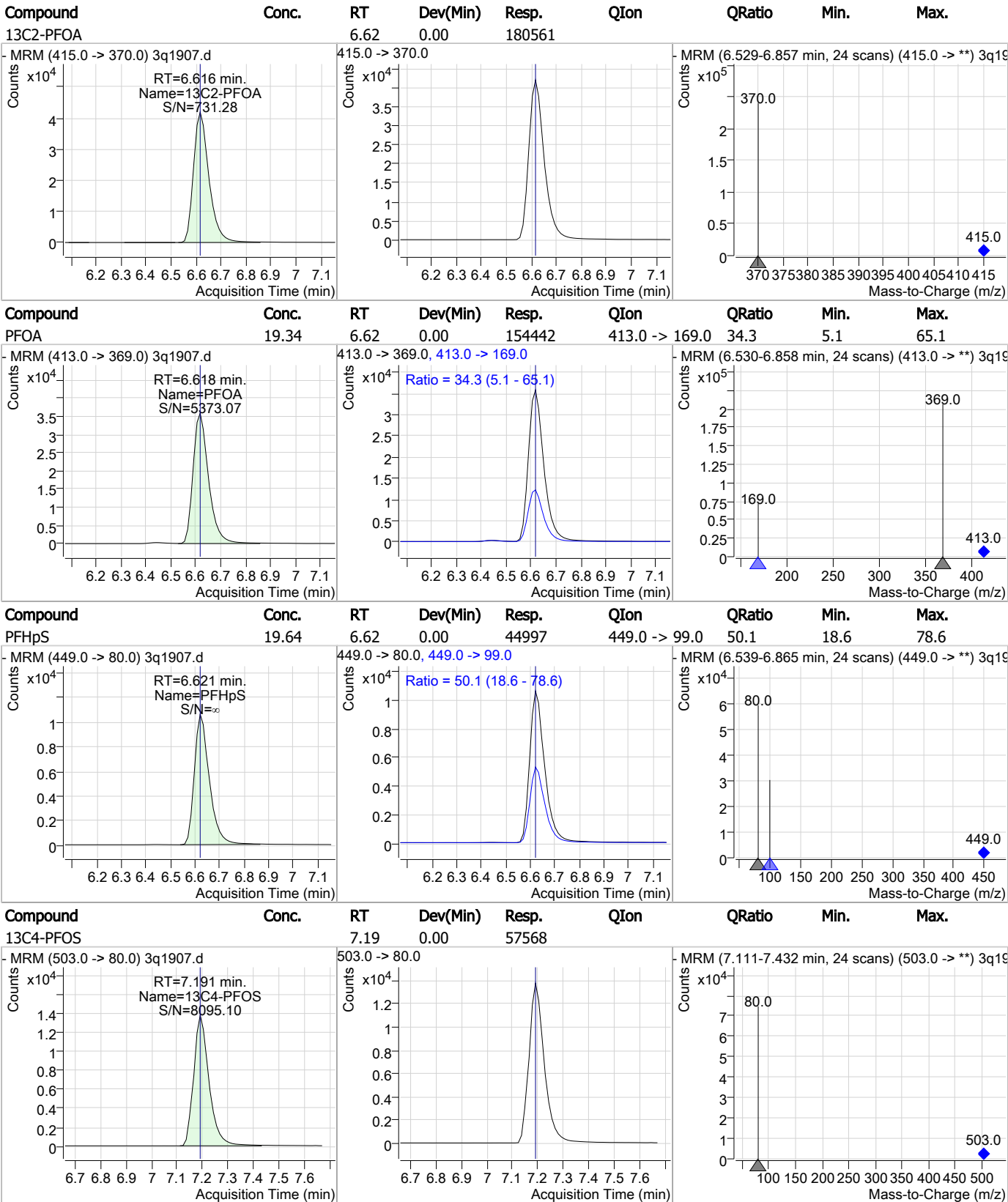
Perfluorinated Compounds by LC/MS/MS



7.6.6
7

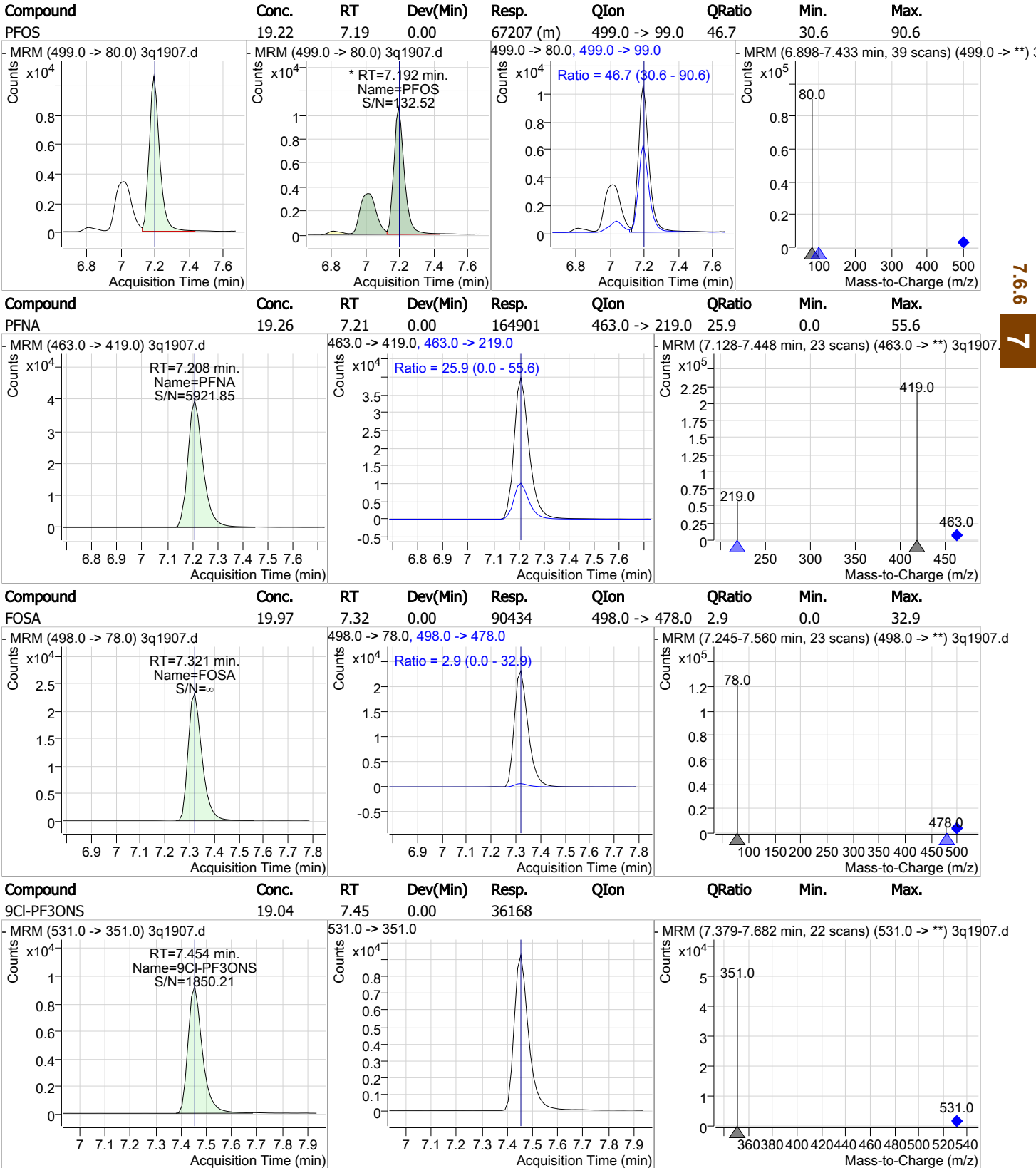


Perfluorinated Compounds by LC/MS/MS



7.6.6
7

Perfluorinated Compounds by LC/MS/MS

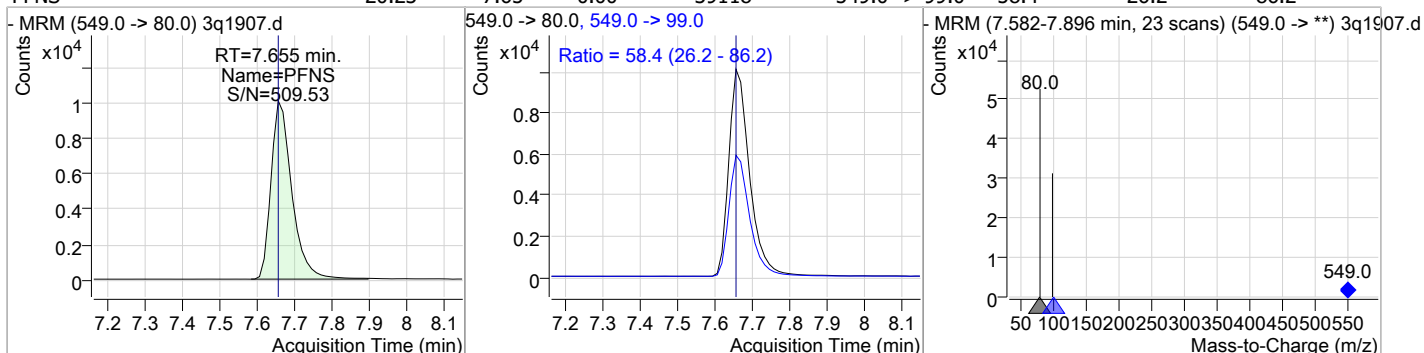


7.6.6

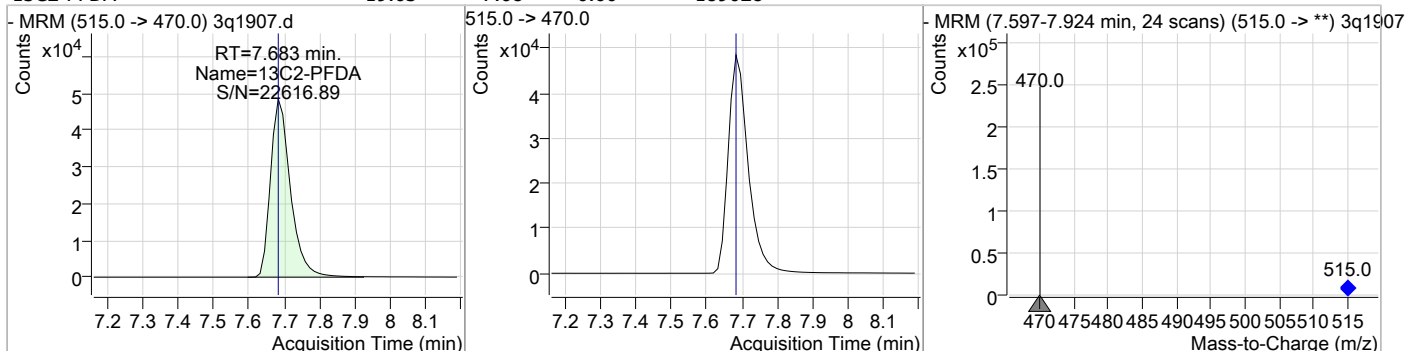
7

Perfluorinated Compounds by LC/MS/MS

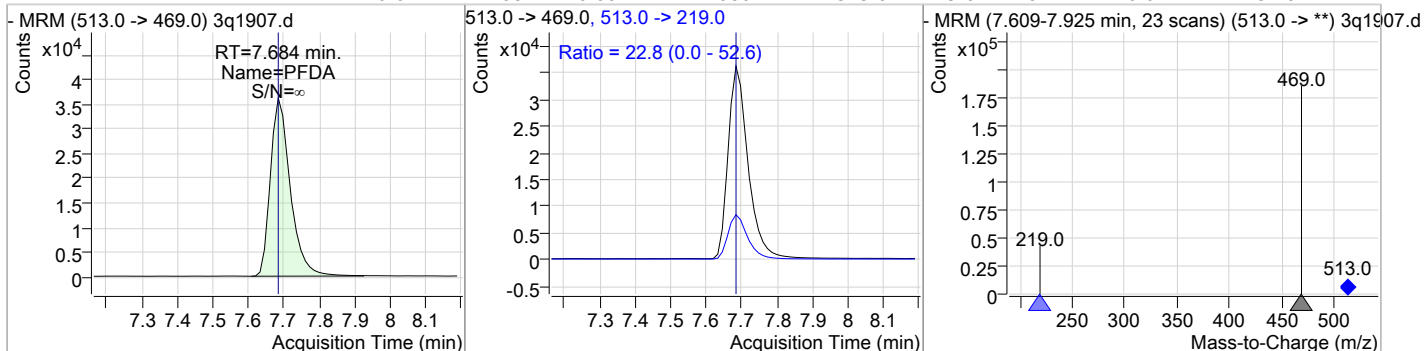
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	20.23	7.65	0.00	39118	549.0 -> 99.0	58.4	26.2	86.2



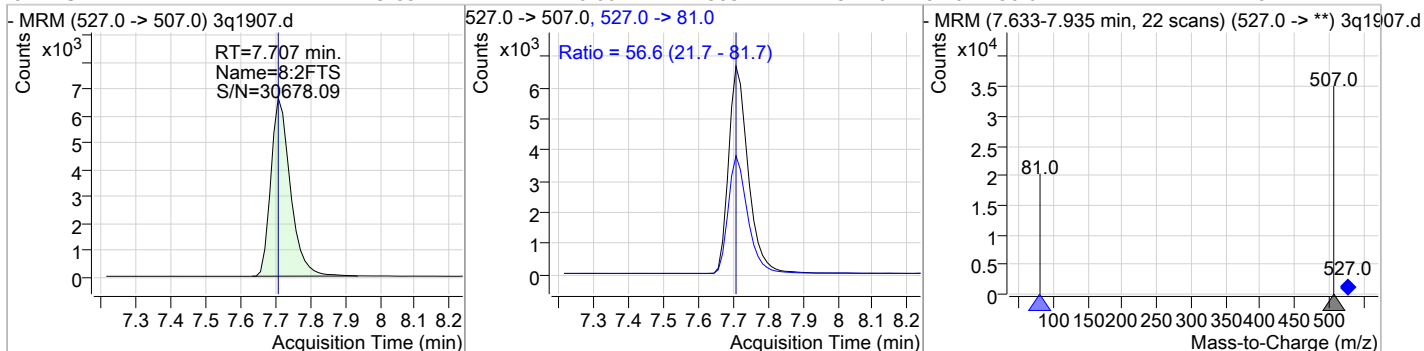
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	19.63	7.68	0.00	189028				



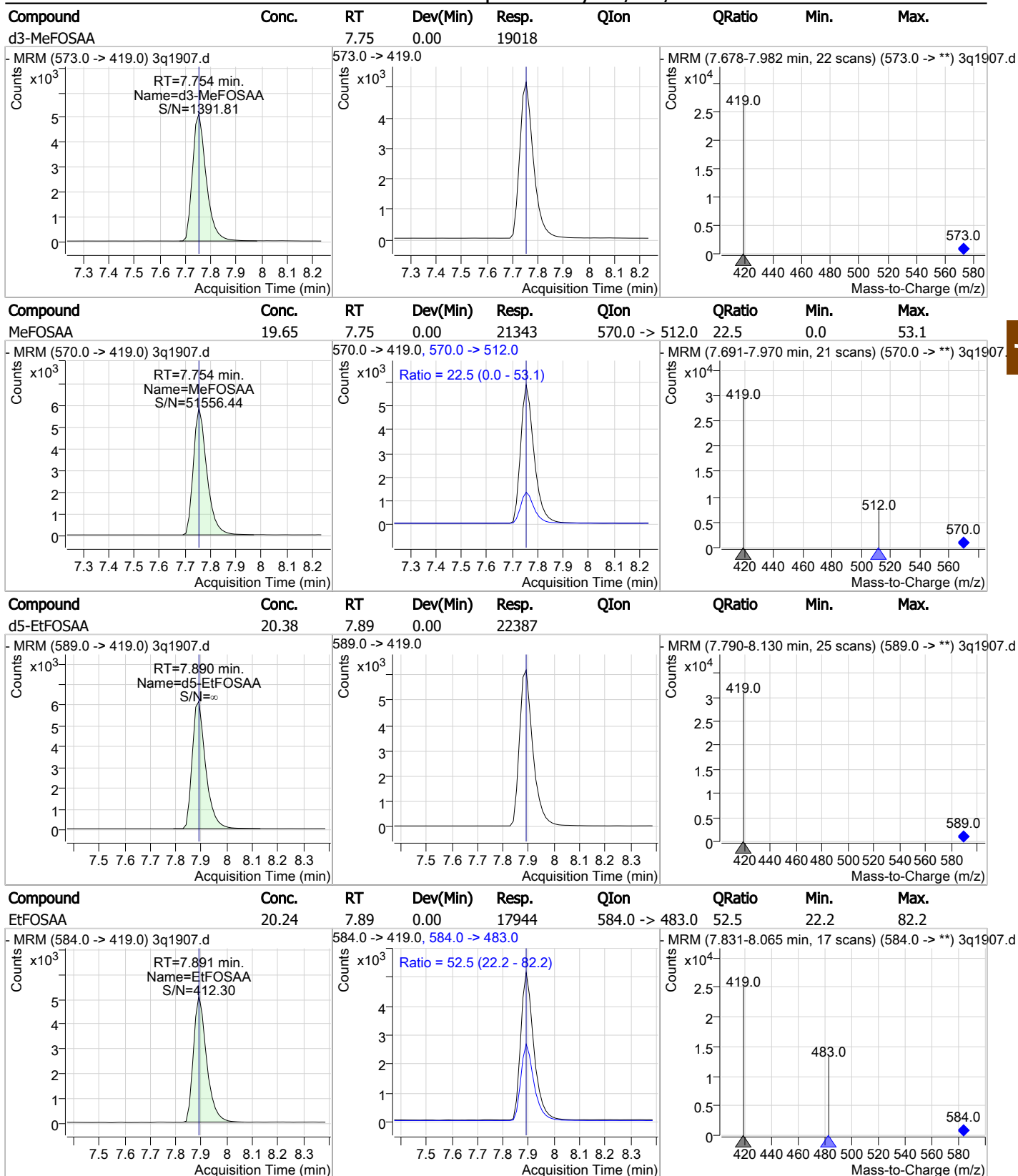
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.64	7.68	0.00	140802	513.0 -> 219.0	22.8	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	19.85	7.71	0.00	25854	527.0 -> 81.0	56.6	21.7	81.7

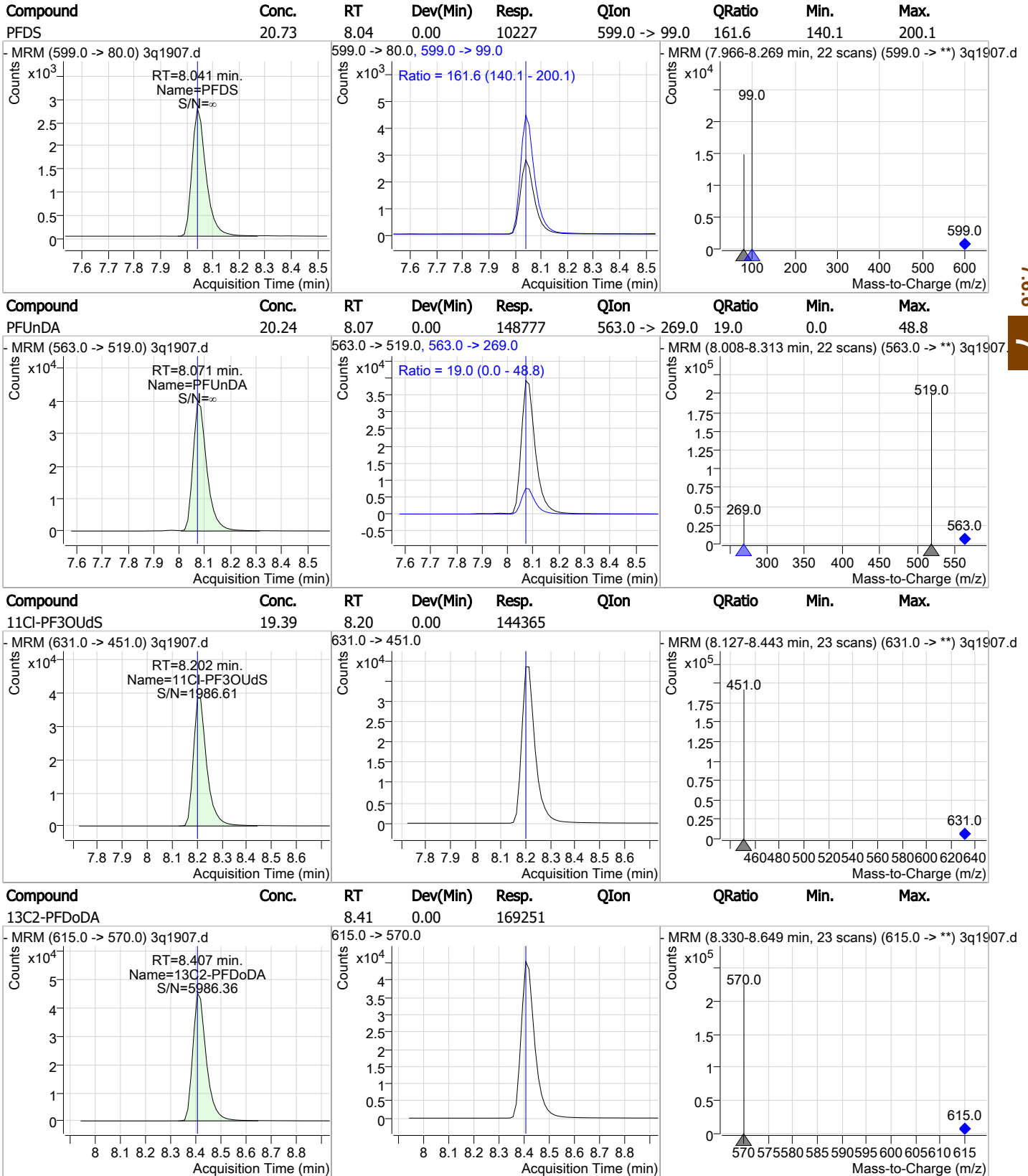


Perfluorinated Compounds by LC/MS/MS



7.6.6
7

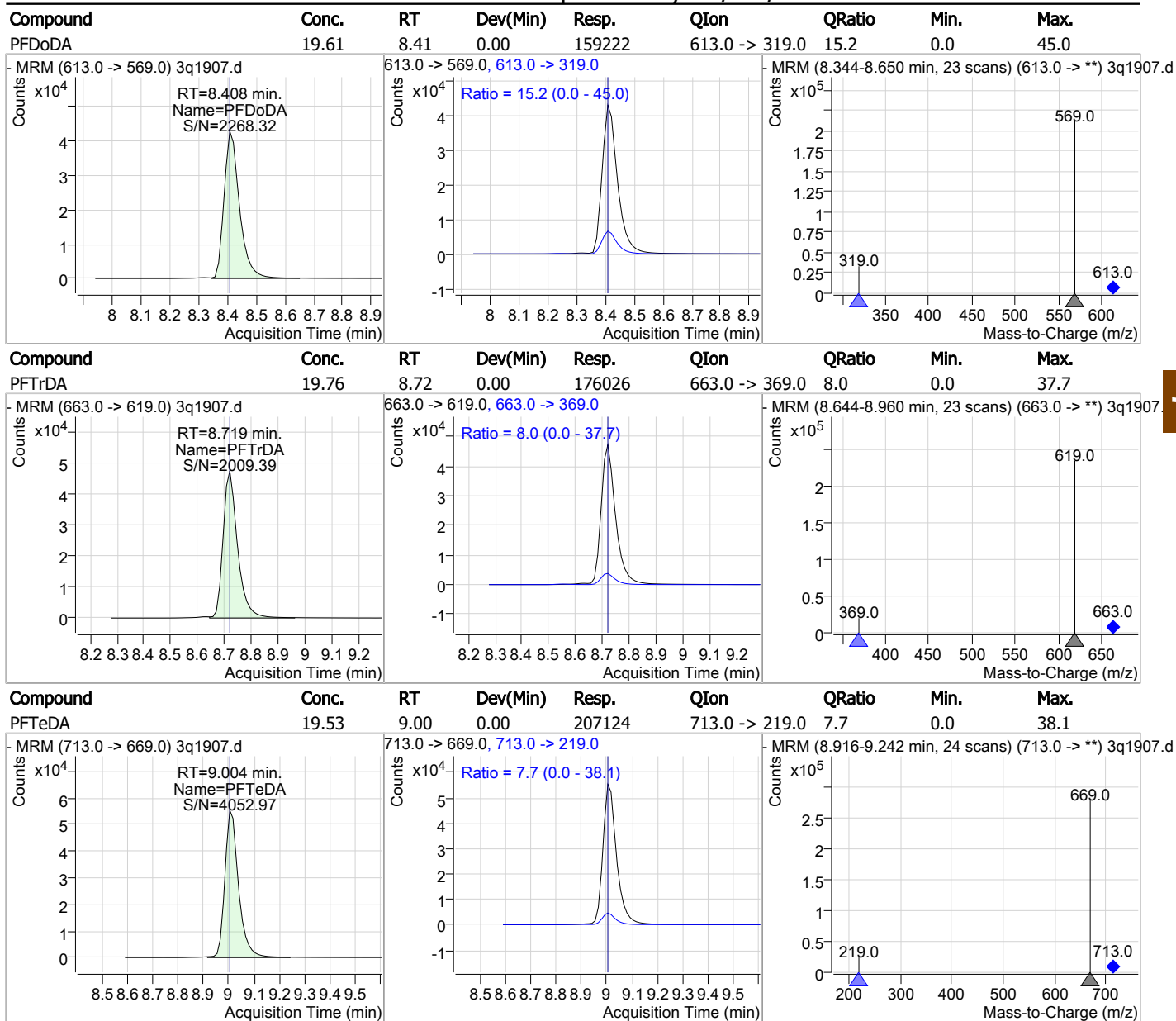
Perfluorinated Compounds by LC/MS/MS



7.6.6

7

Perfluorinated Compounds by LC/MS/MS



7.6.6
7

Manual Integration Approval Summary

Sample Number: S3Q52-ICC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1907.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 13:50 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.6.1
7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/18/19 13:49

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1908.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 2:05:49 PM
 Sample Name : IC52-50
 Vial : P1-A8
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	43551	20.00	µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	172928	20.00	µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	180784	20.00	µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	147868	20.00	µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	58881	20.00	µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	19827	20.00	µg/L	0.000
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	473668	50.34	µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 251.7%		
13C2-PFHxA	4.961	315.0 -> 270.0	510926	50.39	µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 252.0%		
d5-EtFOSAA	7.878	589.0 -> 419.0	58858	51.39	µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 256.9%		
13C3-HFPO-DA	5.253	287.0 -> 169.0	177632	249.74	µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 249.7%		
Target Compounds						
4:2FTS	4.858	327.0 -> 307.0	131729	48.17	µg/L	QValue 97
6:2FTS	6.601	427.0 -> 407.0	106731	46.78	µg/L	99
8:2FTS	7.707	527.0 -> 507.0	68390	47.52	µg/L	95
EtFOSAA	7.891	584.0 -> 419.0	47915	51.85	µg/L	98
FOSA	7.321	498.0 -> 78.0	226945	50.10	µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	57753	50.99	µg/L	99
PFBA	1.701	213.0 -> 169.0	158836	48.75	µg/L	100
PFBS	3.878	299.0 -> 80.0	173554	48.79	µg/L	99
PFDA	7.684	513.0 -> 469.0	353388	51.74	µg/L	100
PFDoDA	8.408	613.0 -> 569.0	415642	50.11	µg/L	99
PFDS	8.041	599.0 -> 80.0	25424	50.38	µg/L	100
PFHpA	5.902	363.0 -> 319.0	675434	49.71	µg/L	99
PFHpS	6.621	449.0 -> 80.0	117152	49.99	µg/L	98
PFHxA	4.962	313.0 -> 269.0	241097	49.30	µg/L	98
PFHxS	5.944	399.0 -> 80.0	133377	50.26	µg/L	m 96
PFNA	7.208	463.0 -> 419.0	431629	50.36	µg/L	99
PFNS	7.655	549.0 -> 80.0	100355	50.73	µg/L	98
PFOA	6.618	413.0 -> 369.0	401390	50.21	µg/L	98
PFOS	7.192	499.0 -> 80.0	175450	49.05	µg/L	m 83
PFPeA	3.562	263.0 -> 219.0	513251	49.42	µg/L	100
PFPeS	5.093	349.0 -> 80.0	104359	50.17	µg/L	98
PFTeDA	9.004	713.0 -> 669.0	552361	50.98	µg/L	99
PFTrDA	8.719	663.0 -> 619.0	458224	50.34	µg/L	99
PFUnDA	8.071	563.0 -> 519.0	379495	50.52	µg/L	99
ADONA	5.999	377.0 -> 251.0	957295	49.28	µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	95294	50.09	µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	375717	50.40	µg/L	100
HFPO-DA	5.258	329.0 -> 169.0	569728	249.01	µg/L	99

7.6.7
7



Perfluorinated Compounds by LC/MS/MS

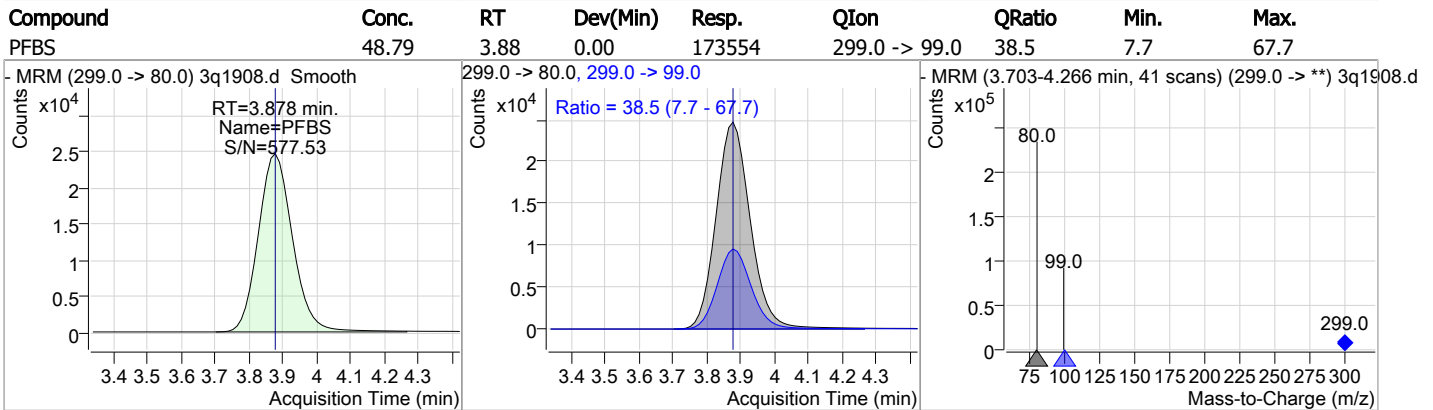
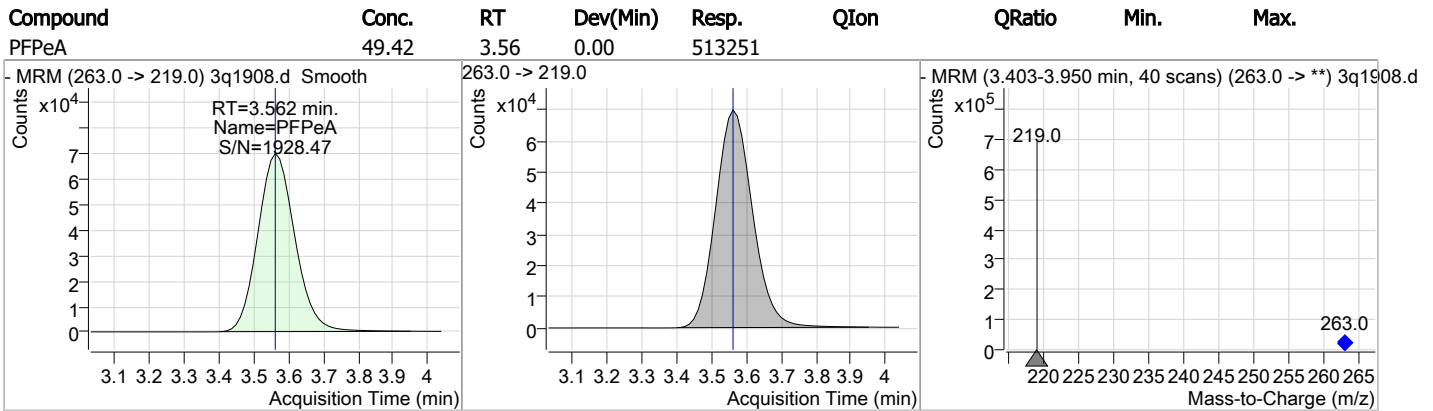
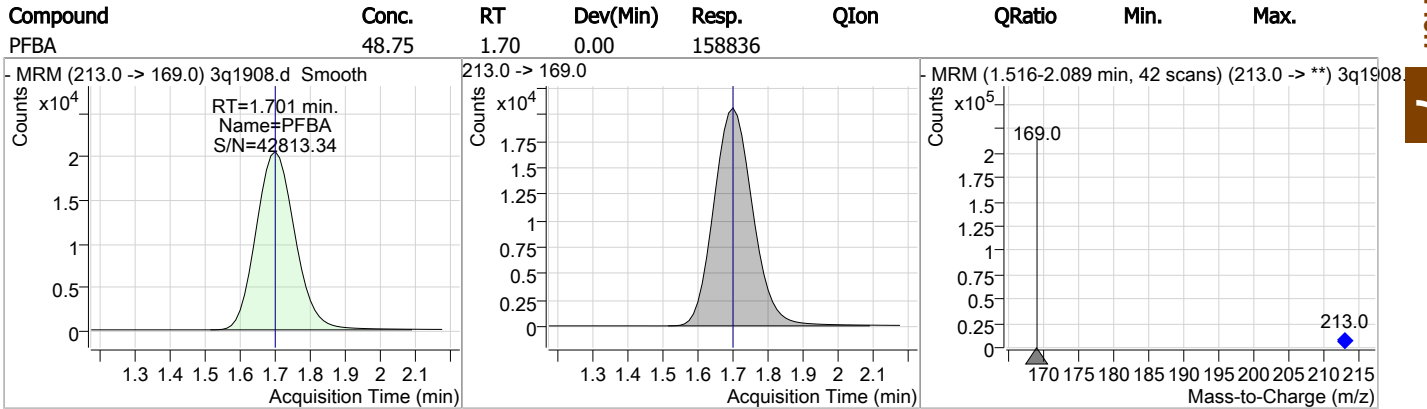
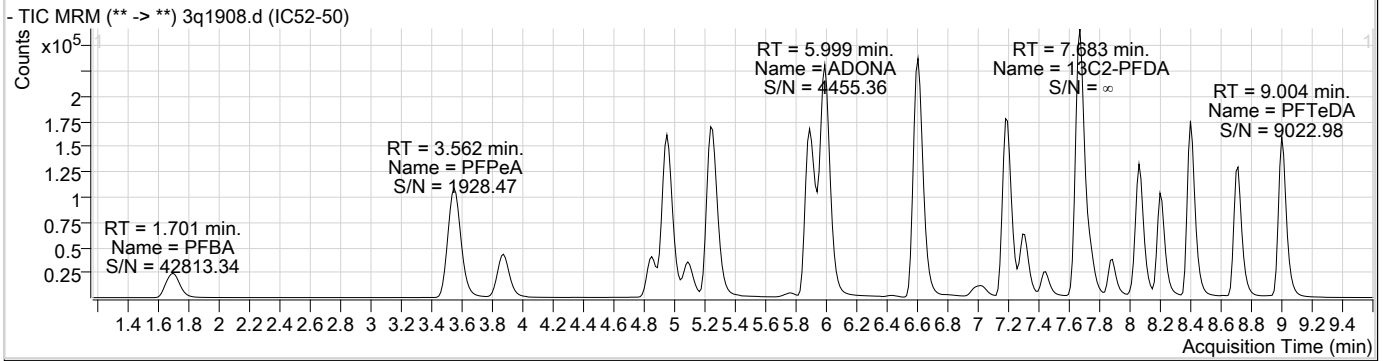
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

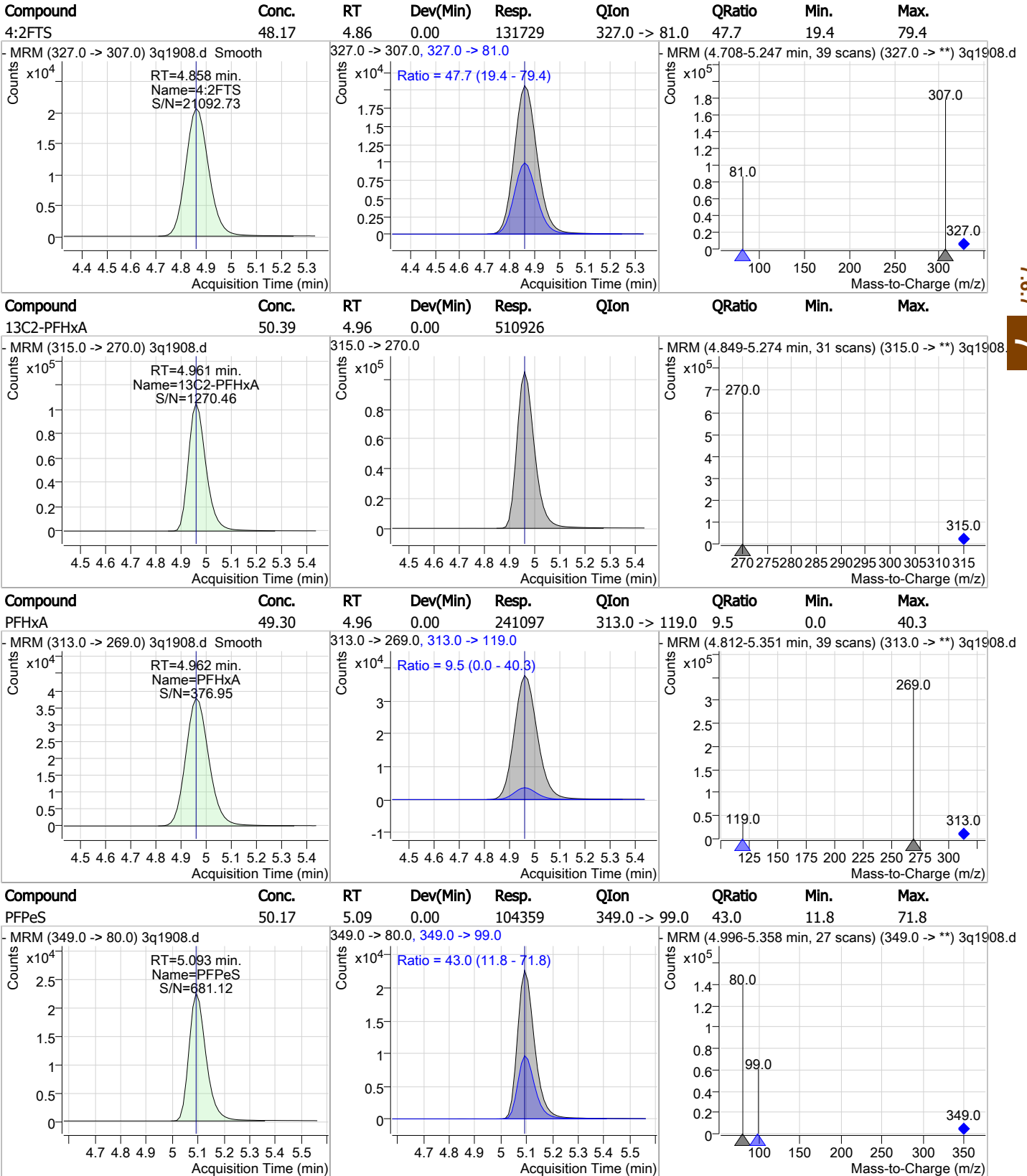
7.6.7

7

Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

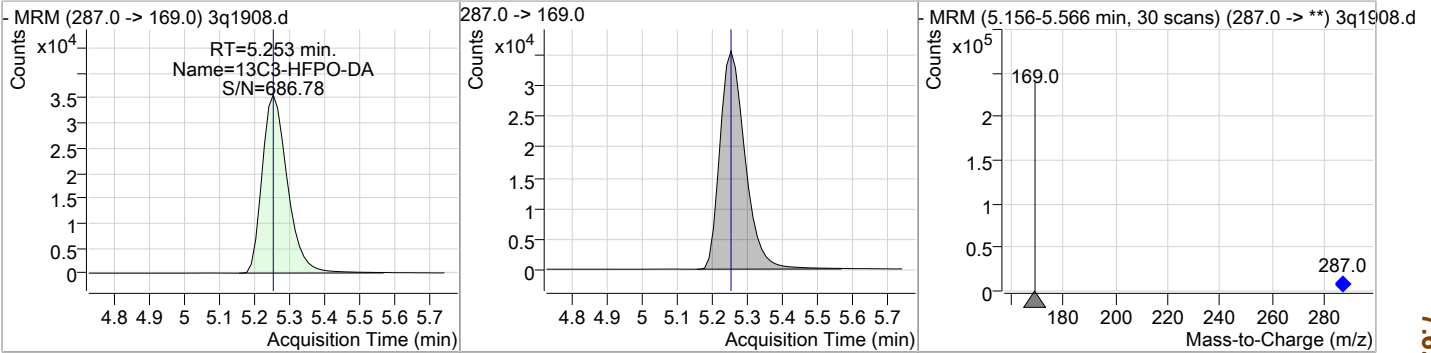


7.67

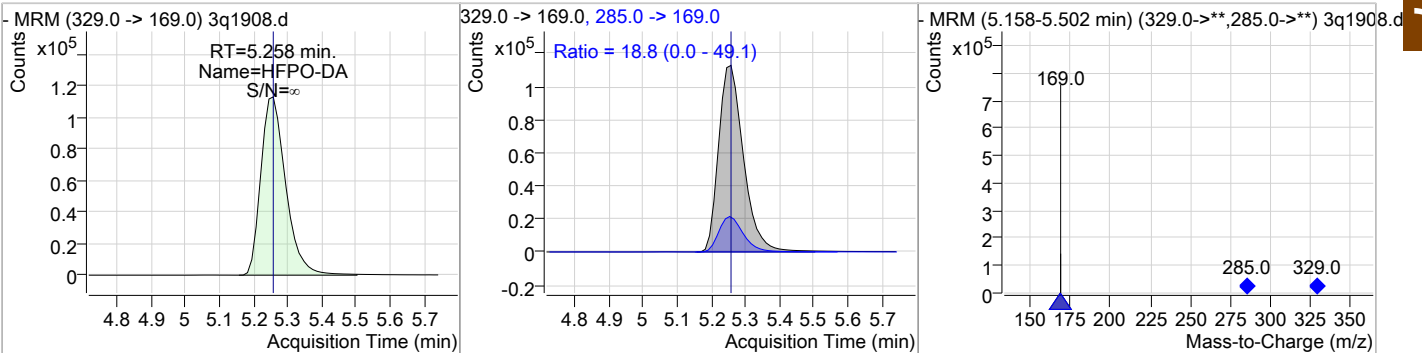
7

Perfluorinated Compounds by LC/MS/MS

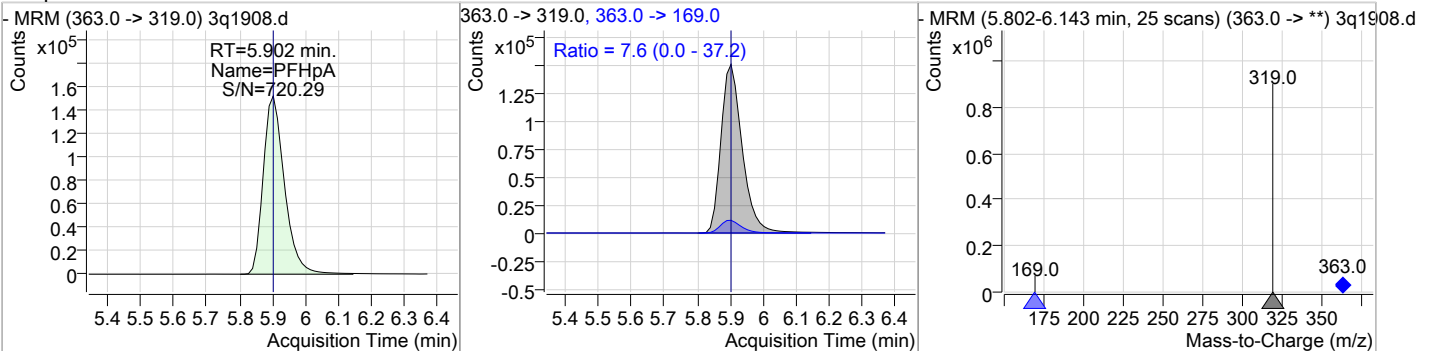
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	249.74	5.25	0.00	177632				



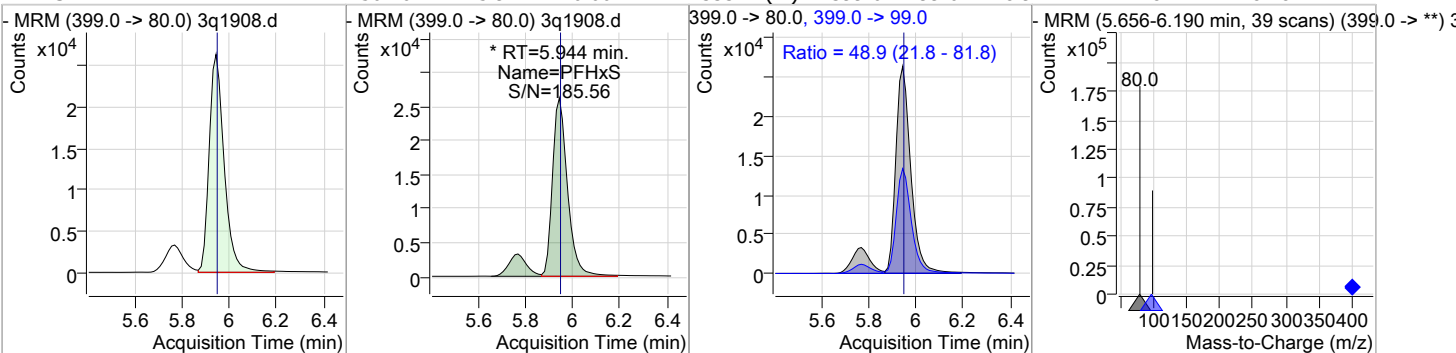
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	249.01	5.26	0.00	569728	285.0 -> 169.0	18.8	0.0	49.1



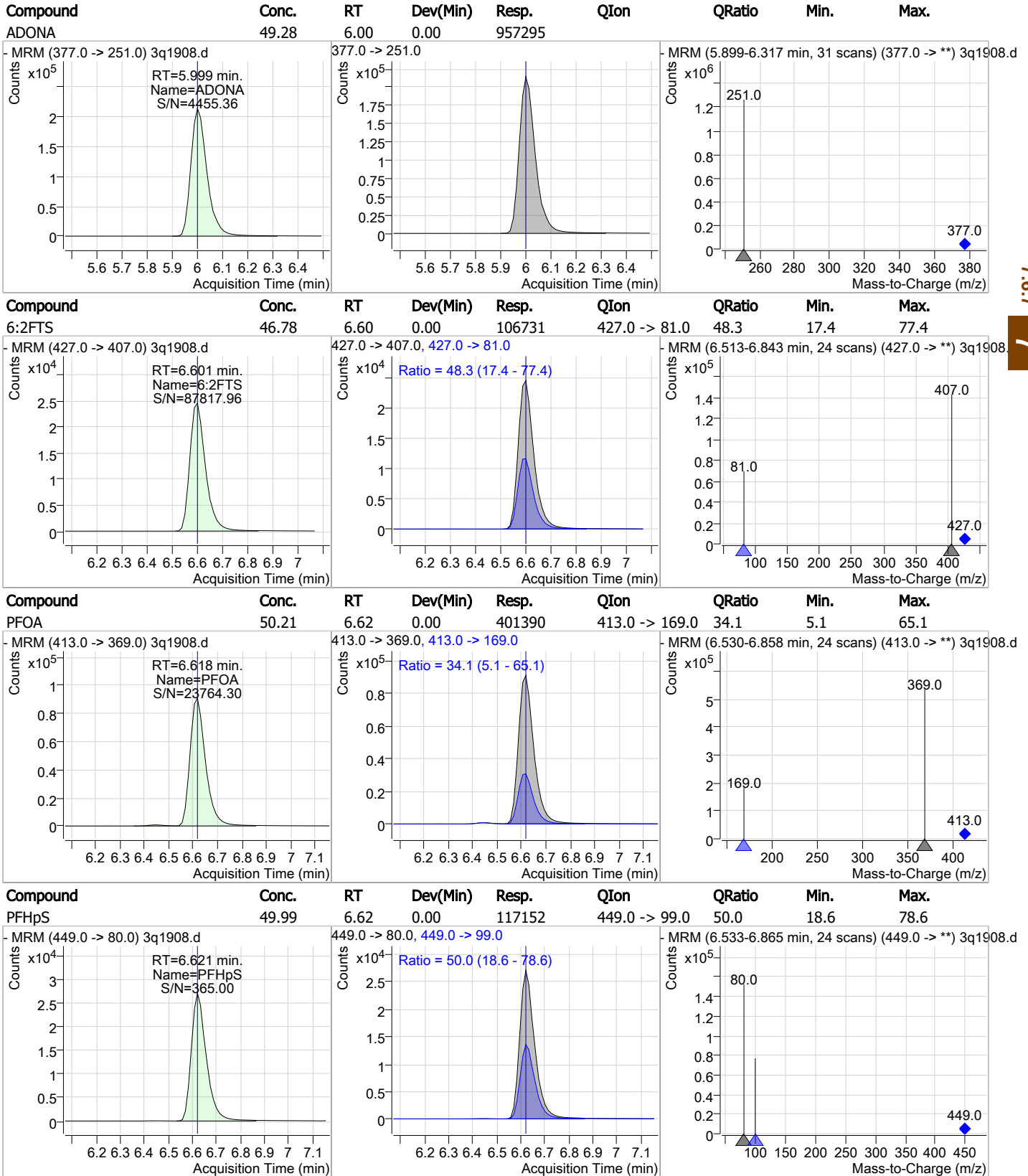
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	49.71	5.90	0.00	675434	363.0 -> 169.0	7.6	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	50.26	5.94	0.00	133377 (m)	399.0 -> 99.0	48.9	21.8	81.8



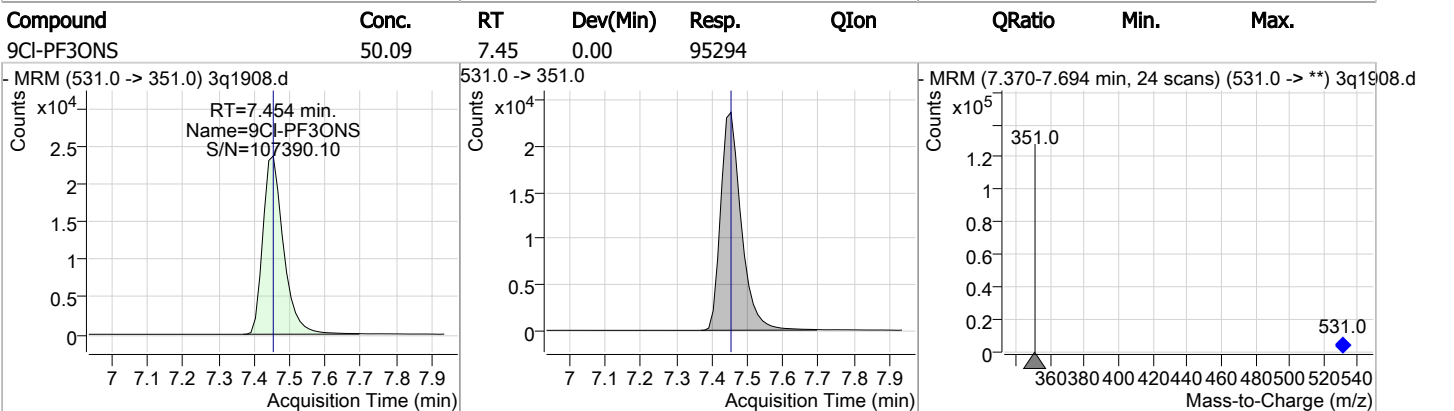
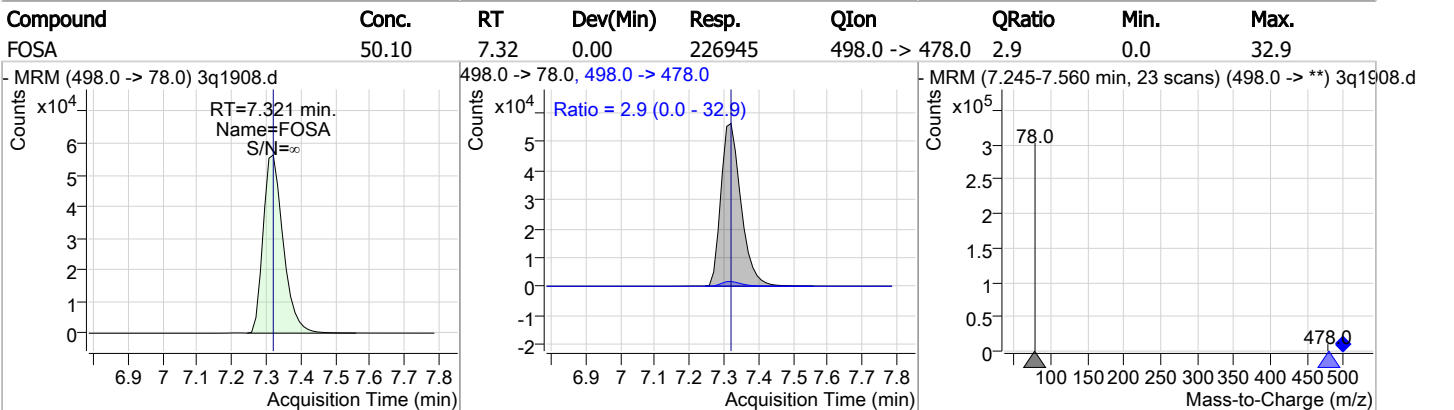
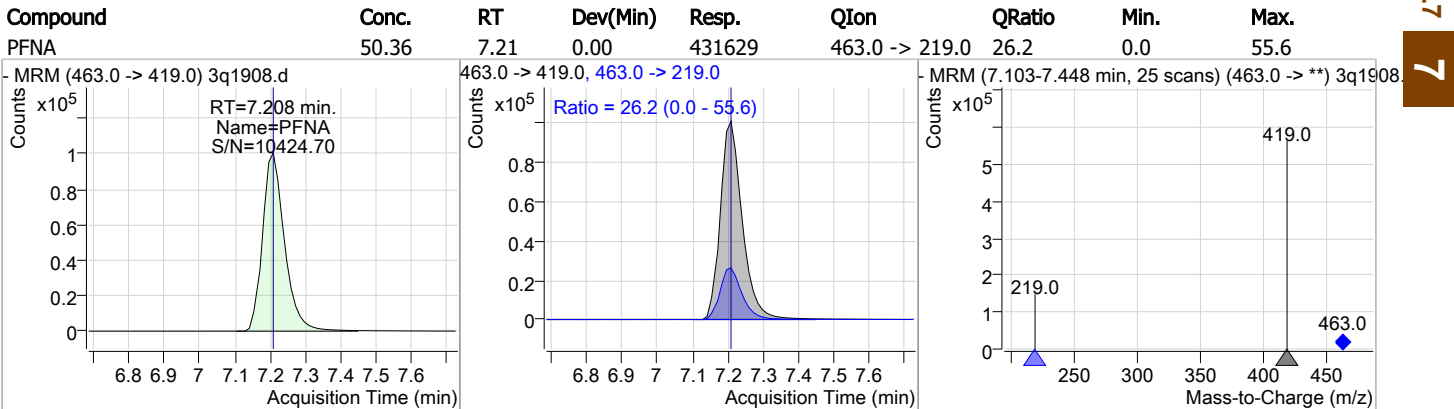
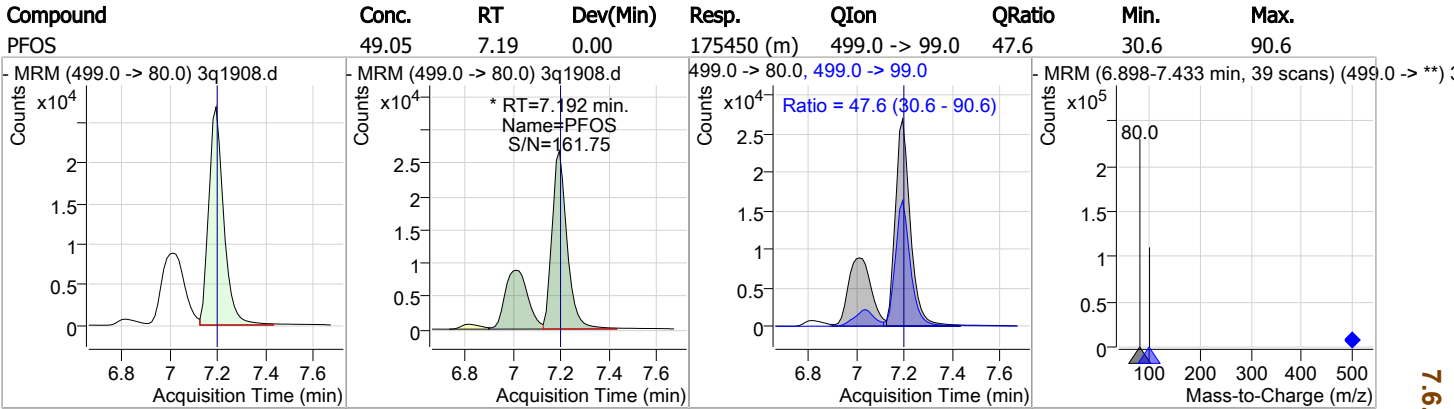
Perfluorinated Compounds by LC/MS/MS



7.67

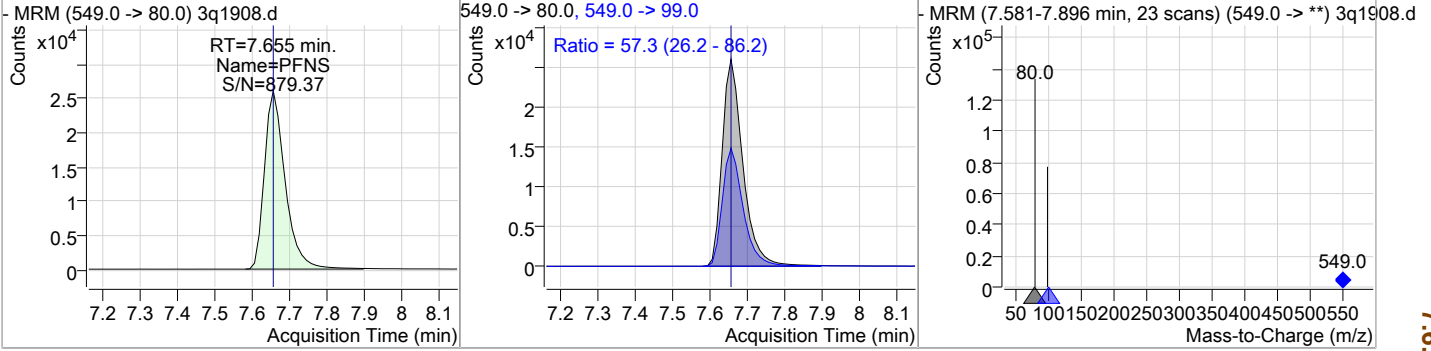
7

Perfluorinated Compounds by LC/MS/MS

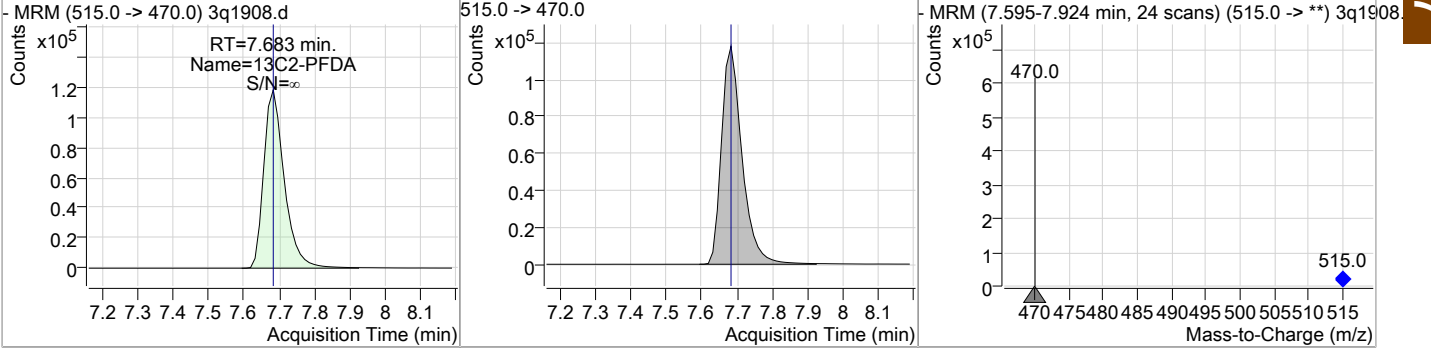


Perfluorinated Compounds by LC/MS/MS

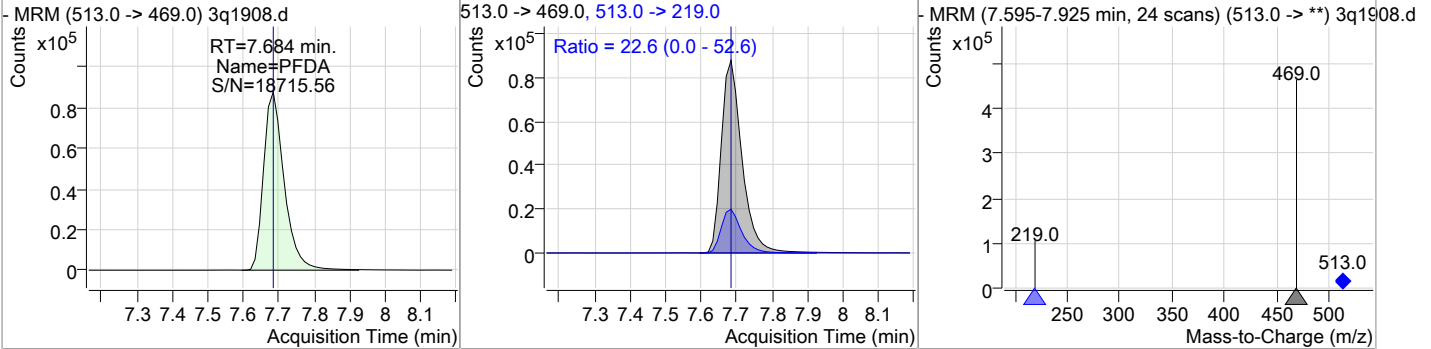
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	50.73	7.65	0.00	100355	549.0 -> 99.0	57.3	26.2	86.2



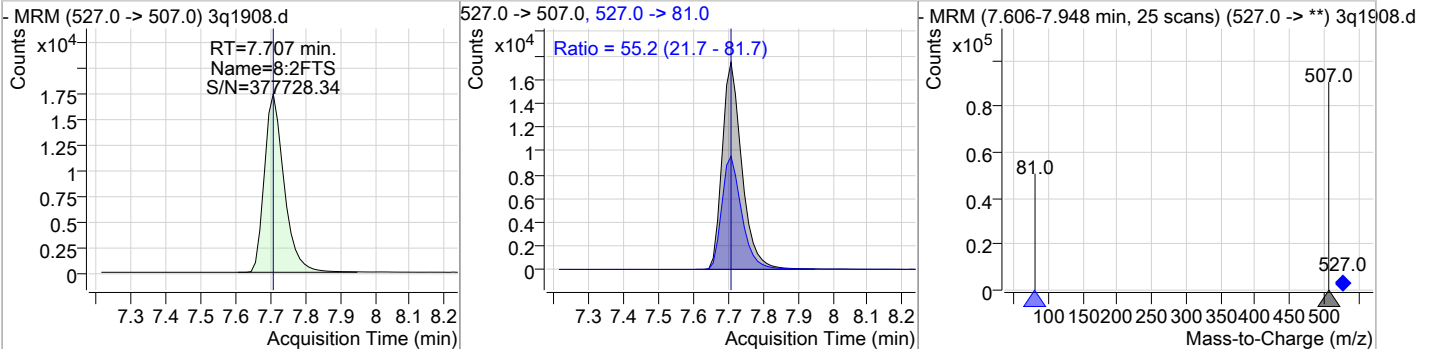
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	50.34	7.68	0.00	473668				



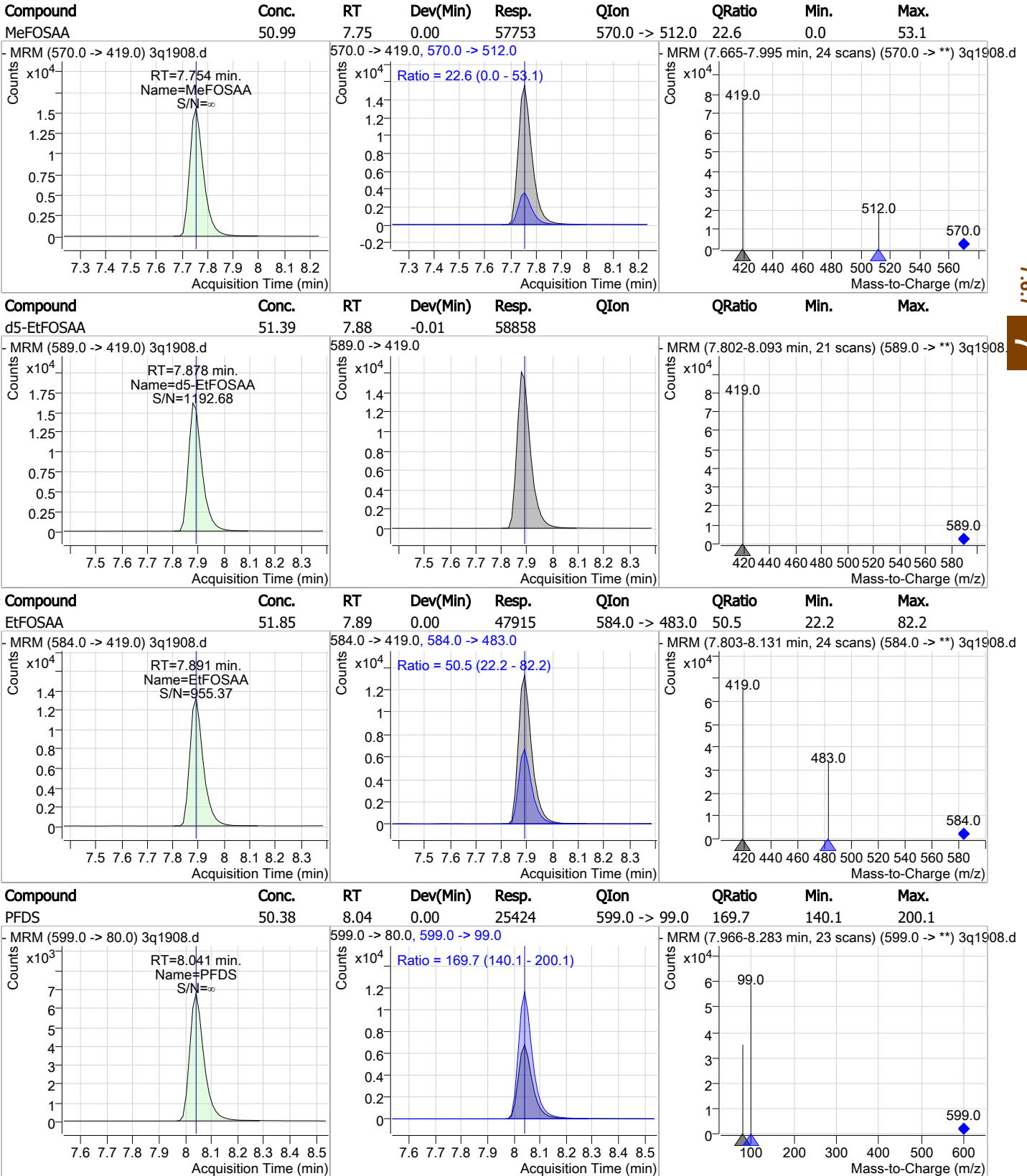
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	51.74	7.68	0.00	353388	513.0 -> 219.0	22.6	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	47.52	7.71	0.00	68390	527.0 -> 81.0	55.2	21.7	81.7



Perfluorinated Compounds by LC/MS/MS

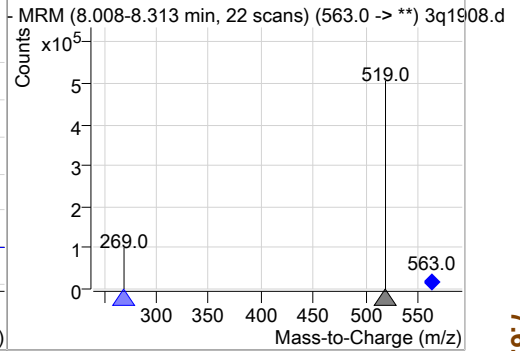
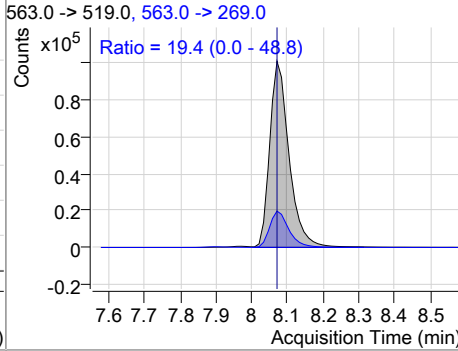
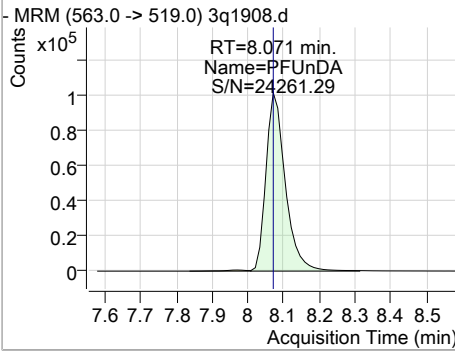


7.6.7

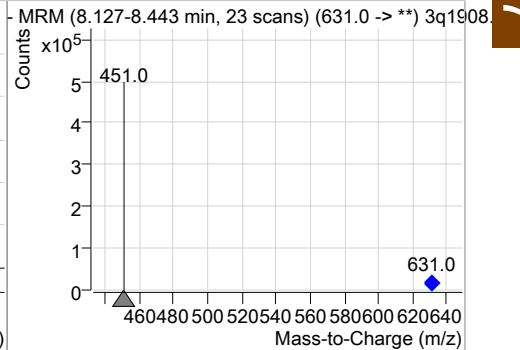
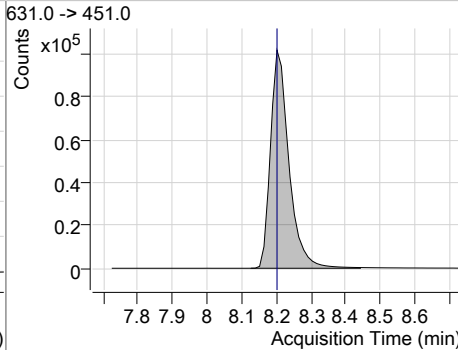
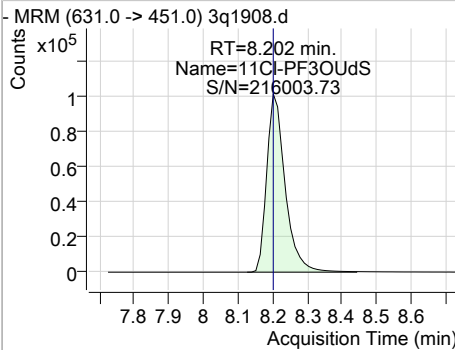
7

Perfluorinated Compounds by LC/MS/MS

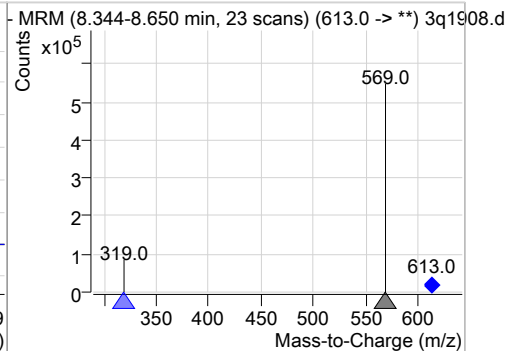
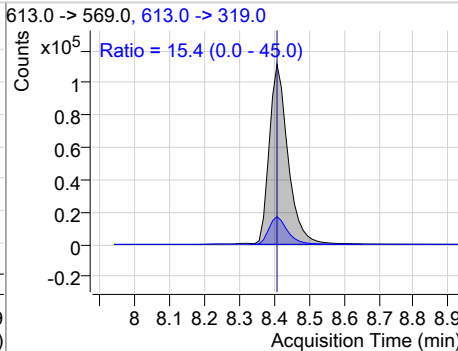
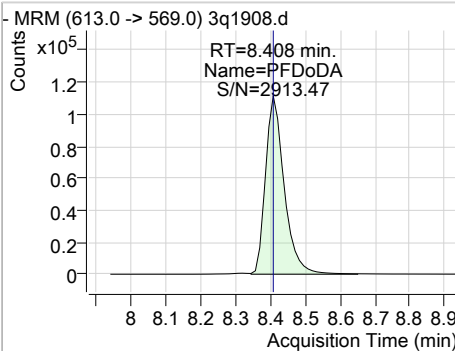
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	50.52	8.07	0.00	379495	563.0 -> 269.0	19.4	0.0	48.8



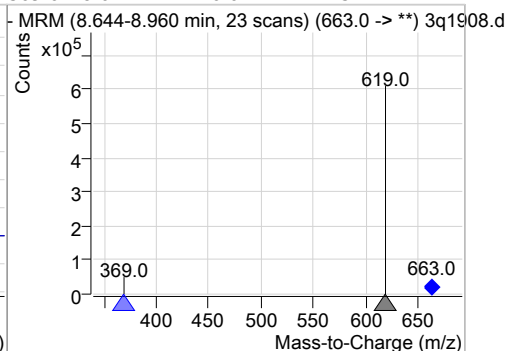
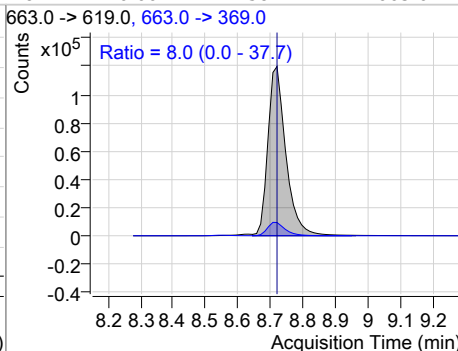
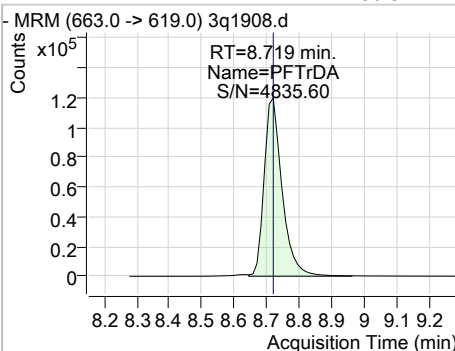
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	50.40	8.20	0.00	375717	631.0 -> 451.0	15.4	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	50.11	8.41	0.00	415642	613.0 -> 319.0	15.4	0.0	45.0

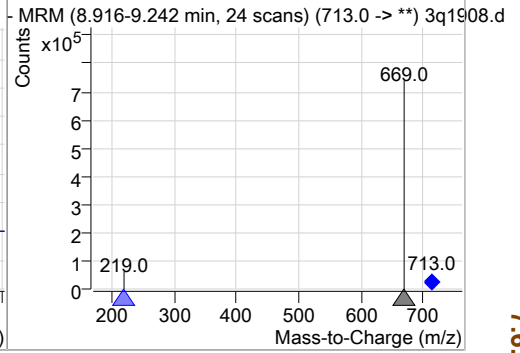
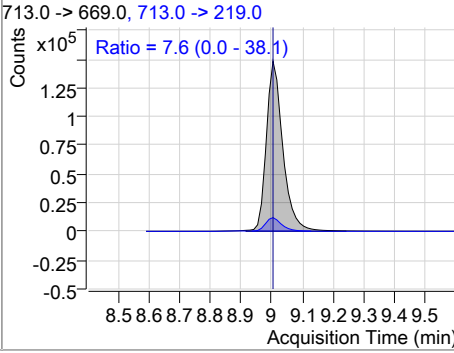
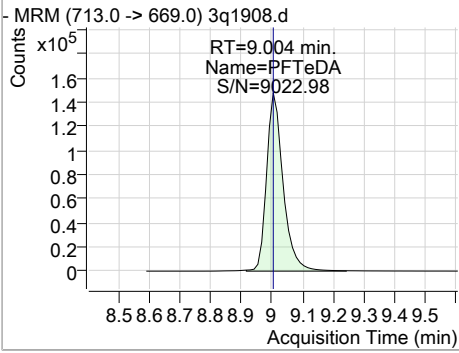


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	50.34	8.72	0.00	458224	663.0 -> 369.0	8.0	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	50.98	9.00	0.00	552361	713.0 -> 219.0	7.6	0.0	38.1



7.6.7
7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1908.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 14:05 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.7.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 03/18/19 13:49

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1909.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 2:21:09 PM
 Sample Name : IC52-100
 Vial : P1-A9
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	44669	20.00 µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	157502	20.00 µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	163430	20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	136991	20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	52556	20.00 µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	18738	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	816344	99.93 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 499.6%	
13C2-PFHxA	4.961	315.0 -> 270.0	939771	99.92 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 499.6%	
d5-EtFOSAA	7.890	589.0 -> 419.0	107385	99.20 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 496.0%	
13C3-HFPO-DA	5.240	287.0 -> 169.0	307181	500.06 µg/L	-0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 500.1%	
Target Compounds					
4:2FTS	4.858	327.0 -> 307.0	247924	88.39 µg/L	QValue 97
6:2FTS	6.601	427.0 -> 407.0	194218	83.00 µg/L	98
8:2FTS	7.707	527.0 -> 507.0	123177	83.45 µg/L	96
EtFOSAA	7.891	584.0 -> 419.0	86445	98.99 µg/L	98
FOSA	7.321	498.0 -> 78.0	398075	99.97 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	106594	99.58 µg/L	100
PFBA	1.701	213.0 -> 169.0	297692	101.07 µg/L	100
PFBS	3.878	299.0 -> 80.0	320519	100.94 µg/L	98
PFDA	7.684	513.0 -> 469.0	611005	98.95 µg/L	100
PFDoDA	8.408	613.0 -> 569.0	755941	100.06 µg/L	99
PFDS	8.041	599.0 -> 80.0	44896	99.67 µg/L	97
PFHpA	5.902	363.0 -> 319.0	1233628	100.44 µg/L	99
PFHpS	6.621	449.0 -> 80.0	209417	100.12 µg/L	98
PFHxA	4.962	313.0 -> 269.0	445022	100.67 µg/L	98
PFHxS	5.944	399.0 -> 80.0	236881	100.00 µg/L	m 99
PFNA	7.208	463.0 -> 419.0	774998	100.02 µg/L	99
PFNS	7.655	549.0 -> 80.0	175834	99.59 µg/L	98
PFOA	6.618	413.0 -> 369.0	723301	100.08 µg/L	98
PFOS	7.192	499.0 -> 80.0	321590	100.73 µg/L	m 82
PFPeA	3.562	263.0 -> 219.0	966792	100.48 µg/L	100
PFPeS	5.093	349.0 -> 80.0	192715	100.01 µg/L	99
PFTeDA	9.004	713.0 -> 669.0	982963	99.60 µg/L	99
PFTrDA	8.719	663.0 -> 619.0	828108	99.90 µg/L	99
PFUnDA	8.071	563.0 -> 519.0	682031	99.68 µg/L	99
ADONA	5.999	377.0 -> 251.0	1768540	100.71 µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	172351	100.22 µg/L	100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	673782	99.98 µg/L	100
HFPO-DA	5.245	329.0 -> 169.0	989639	500.23 µg/L	98

7.6.8
7



Perfluorinated Compounds by LC/MS/MS

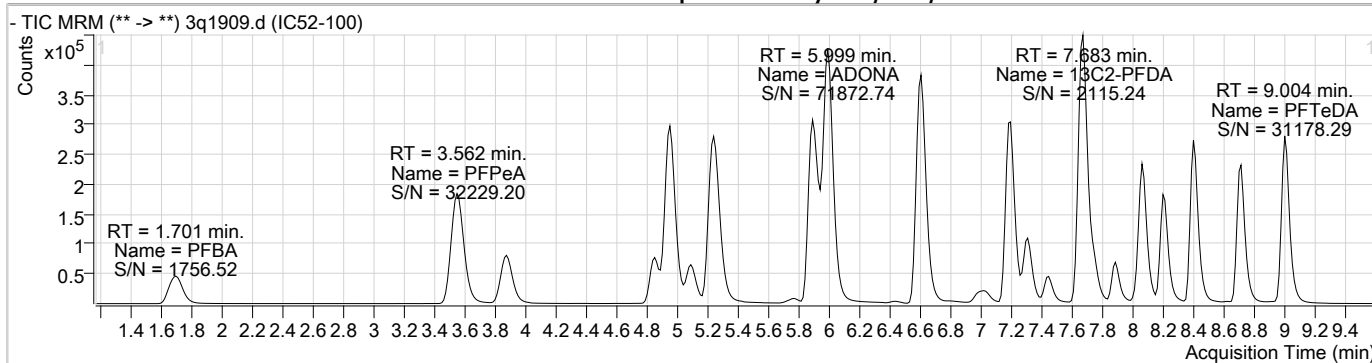
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

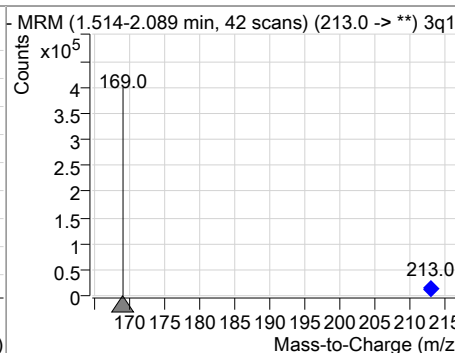
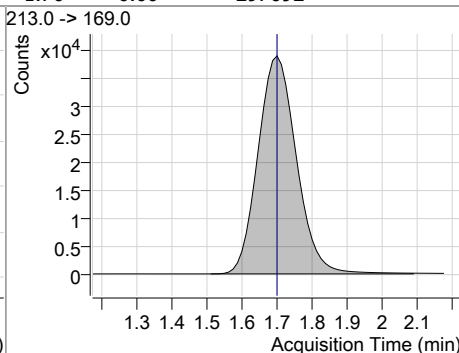
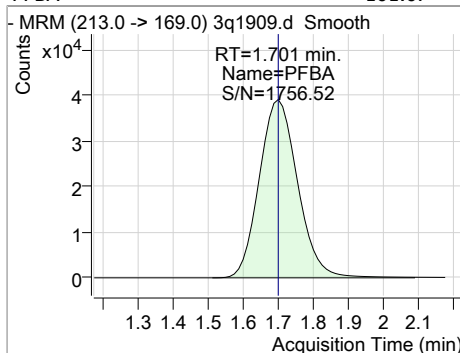
7.6.8

7

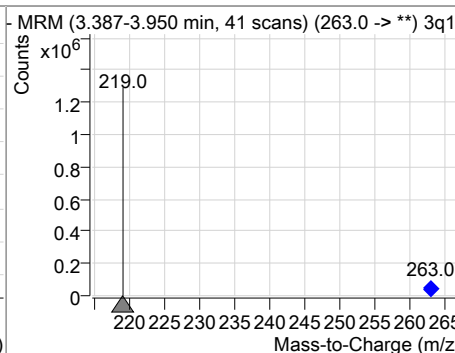
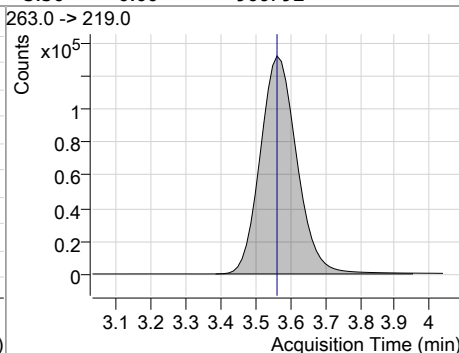
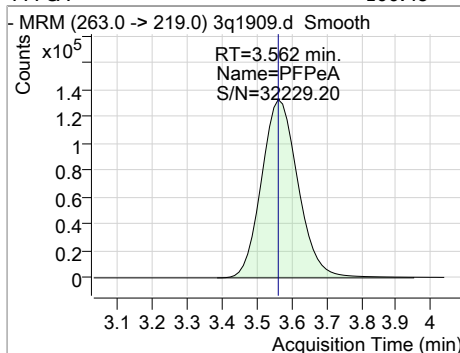
Perfluorinated Compounds by LC/MS/MS



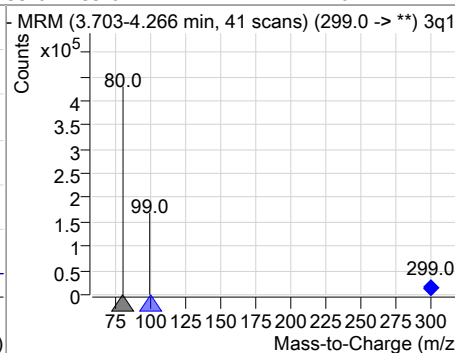
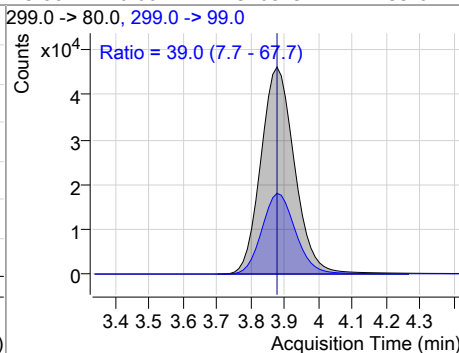
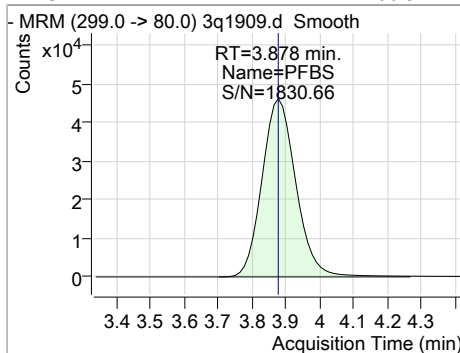
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	101.07	1.70	0.00	297692				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	100.48	3.56	0.00	966792				

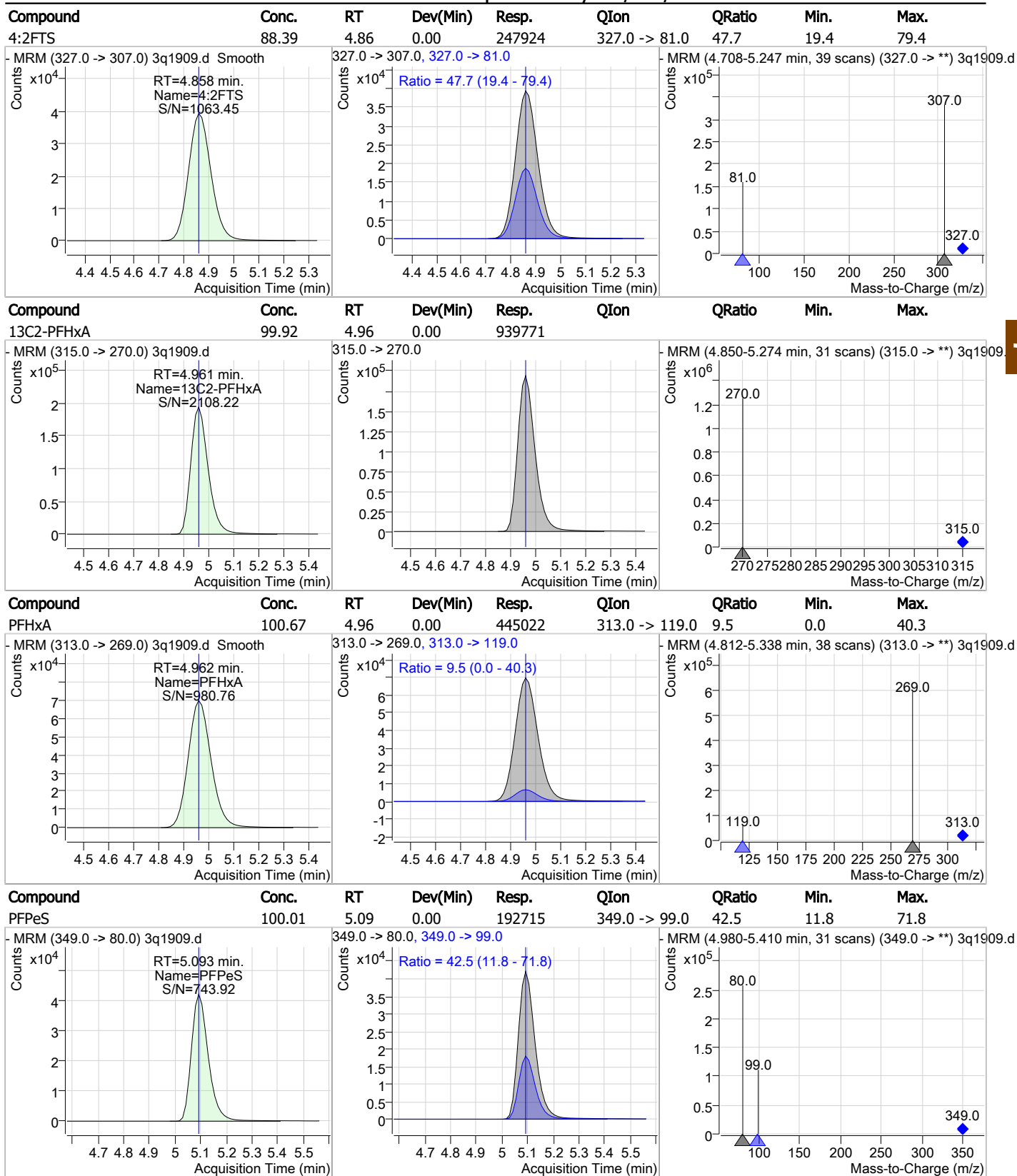


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	100.94	3.88	0.00	320519	299.0 -> 99.0	39.0	7.7	67.7



7.6.8
7

Perfluorinated Compounds by LC/MS/MS

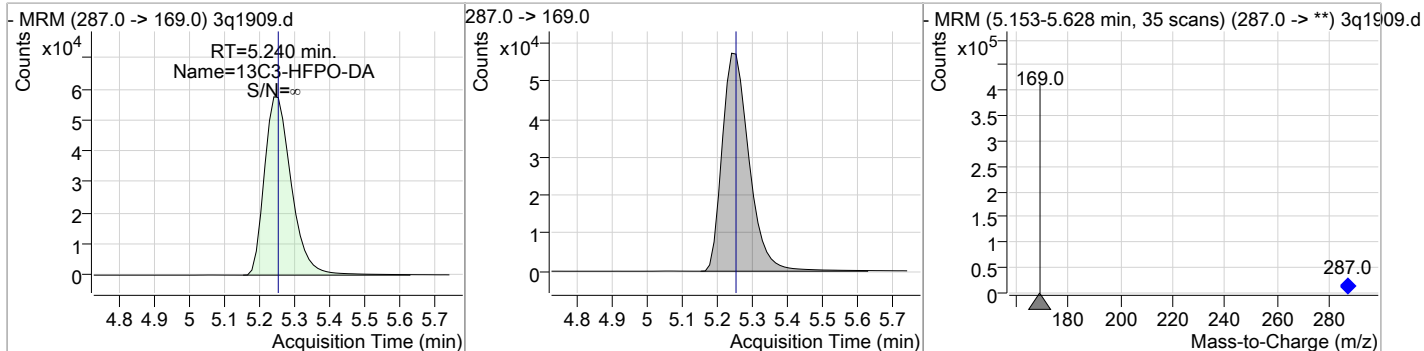


7.6.8
7

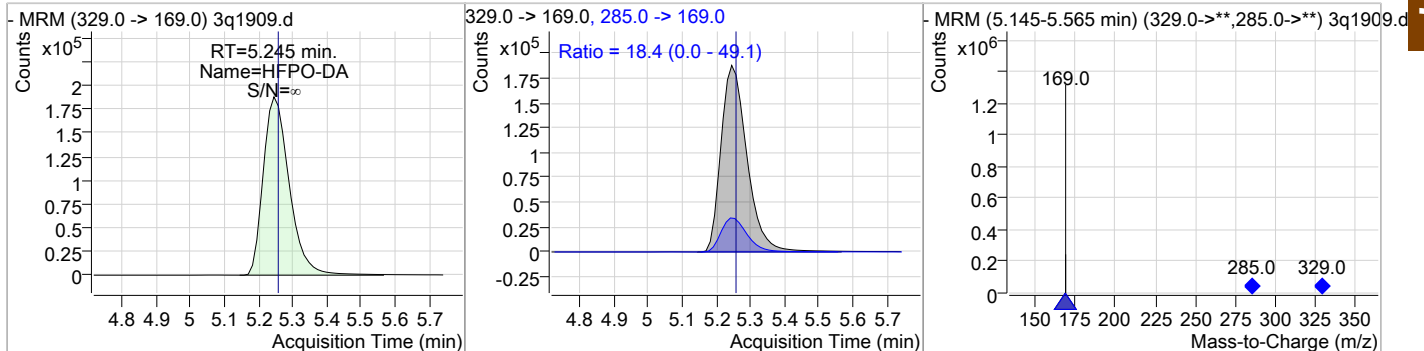


Perfluorinated Compounds by LC/MS/MS

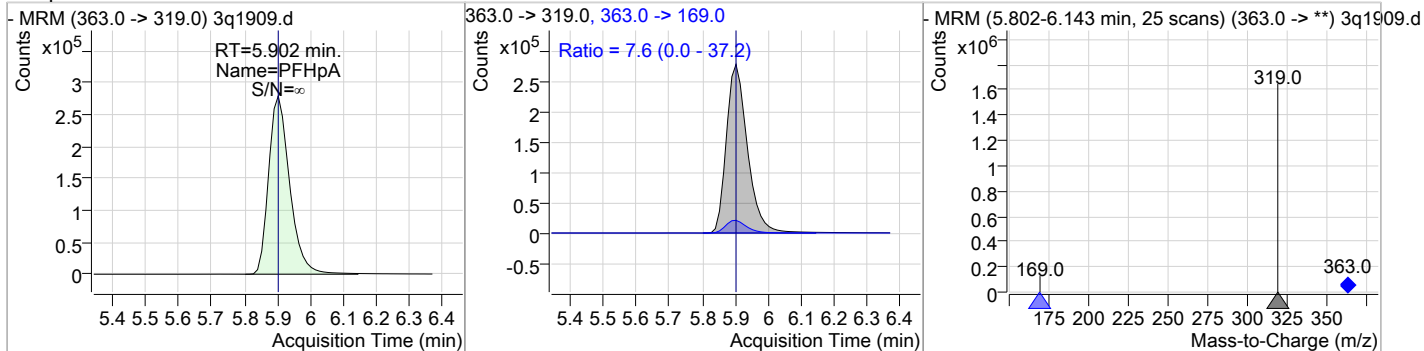
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



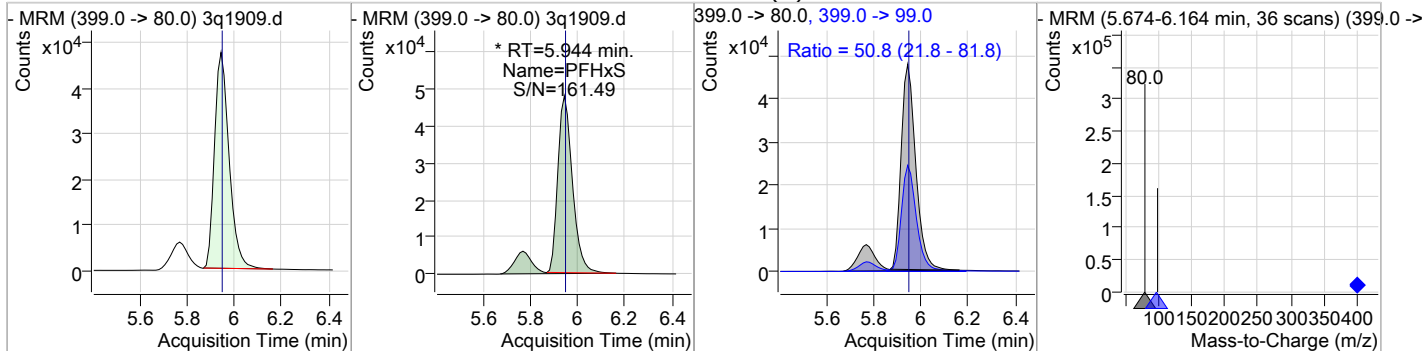
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



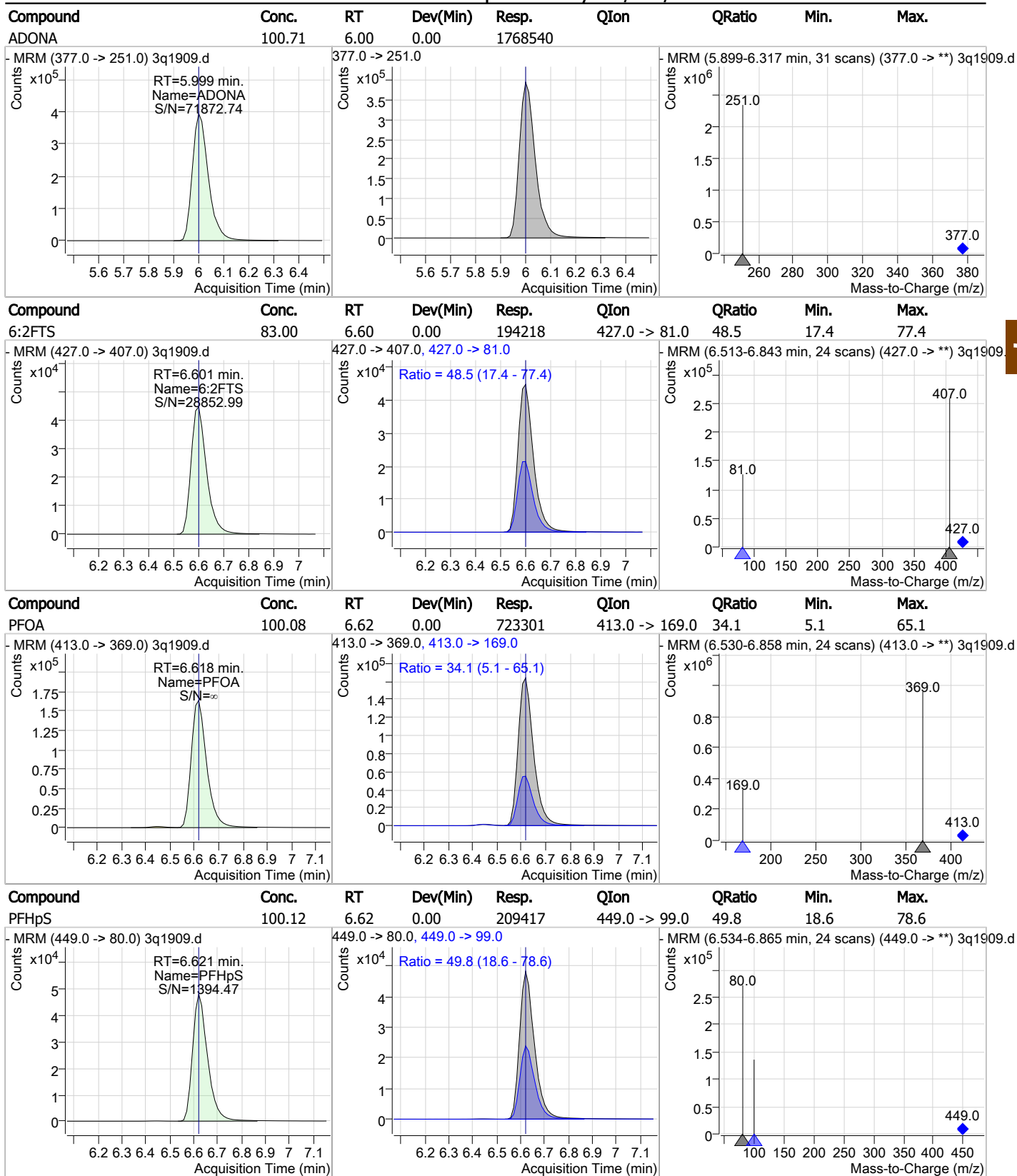
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



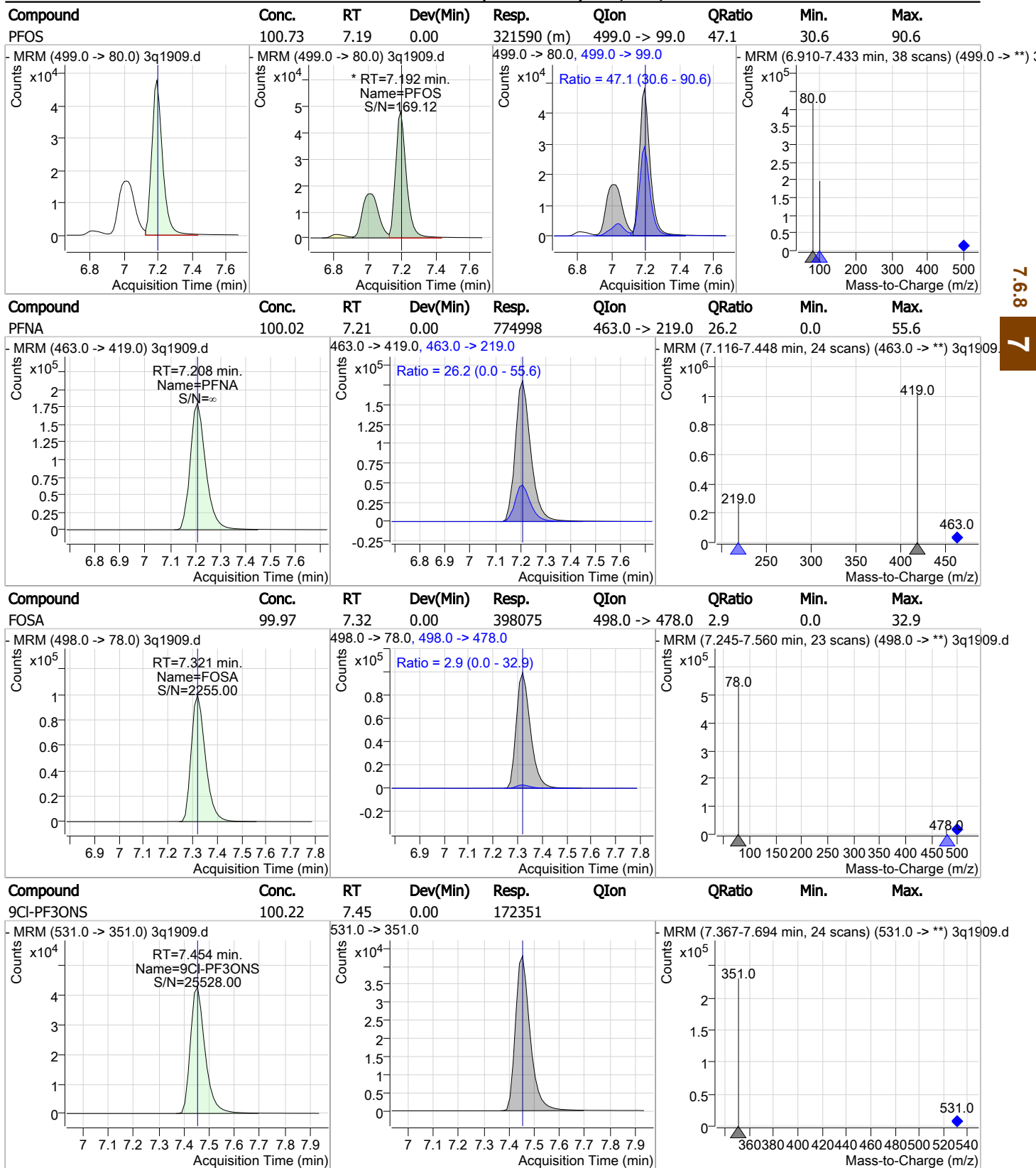
Perfluorinated Compounds by LC/MS/MS



7.6.8



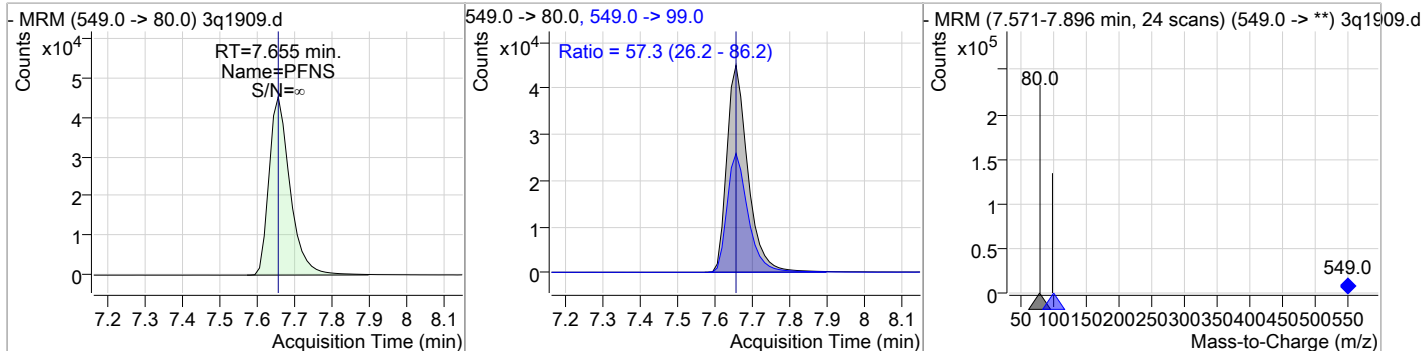
Perfluorinated Compounds by LC/MS/MS



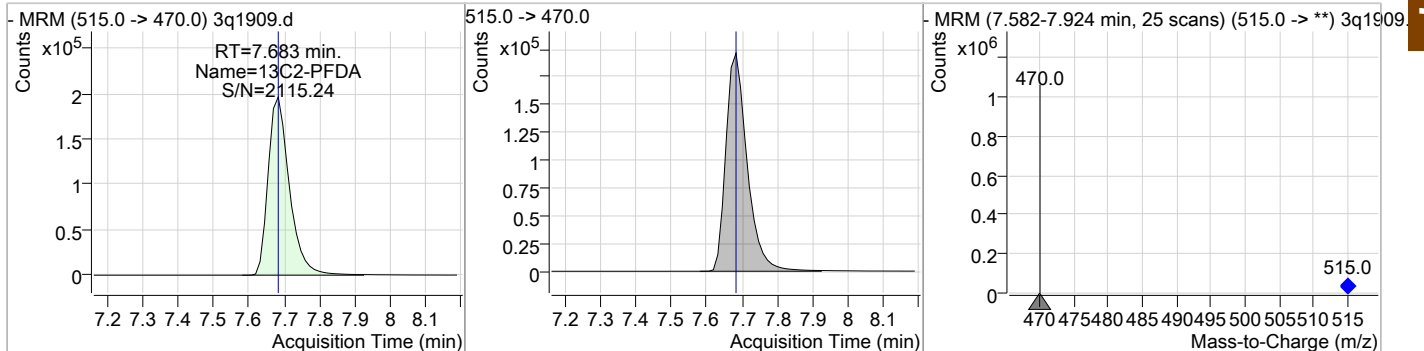
7.6.8
7

Perfluorinated Compounds by LC/MS/MS

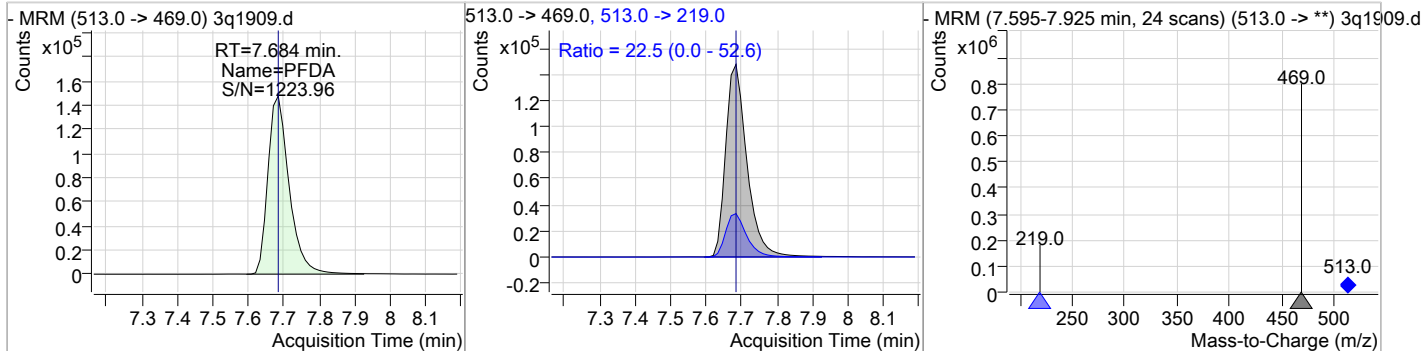
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	99.59	7.65	0.00	175834	549.0 -> 99.0	57.3	26.2	86.2



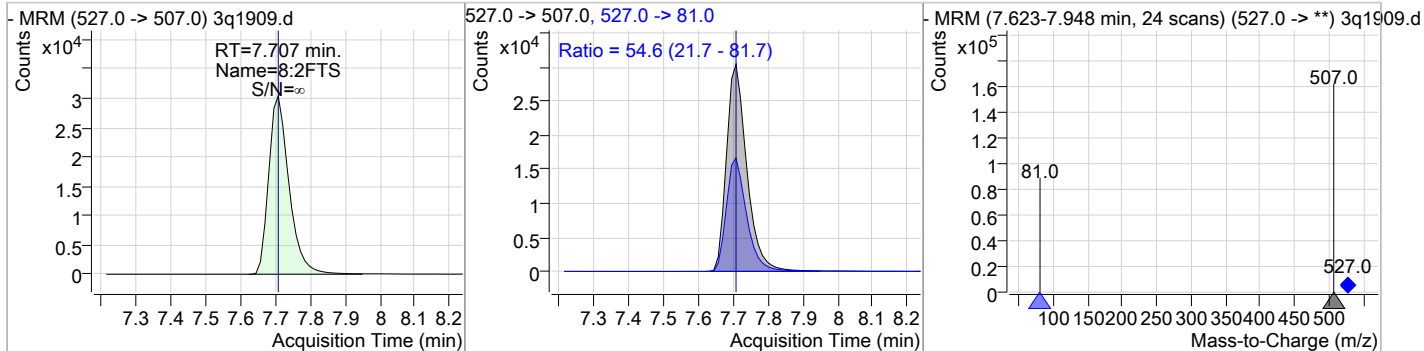
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	99.93	7.68	0.00	816344				



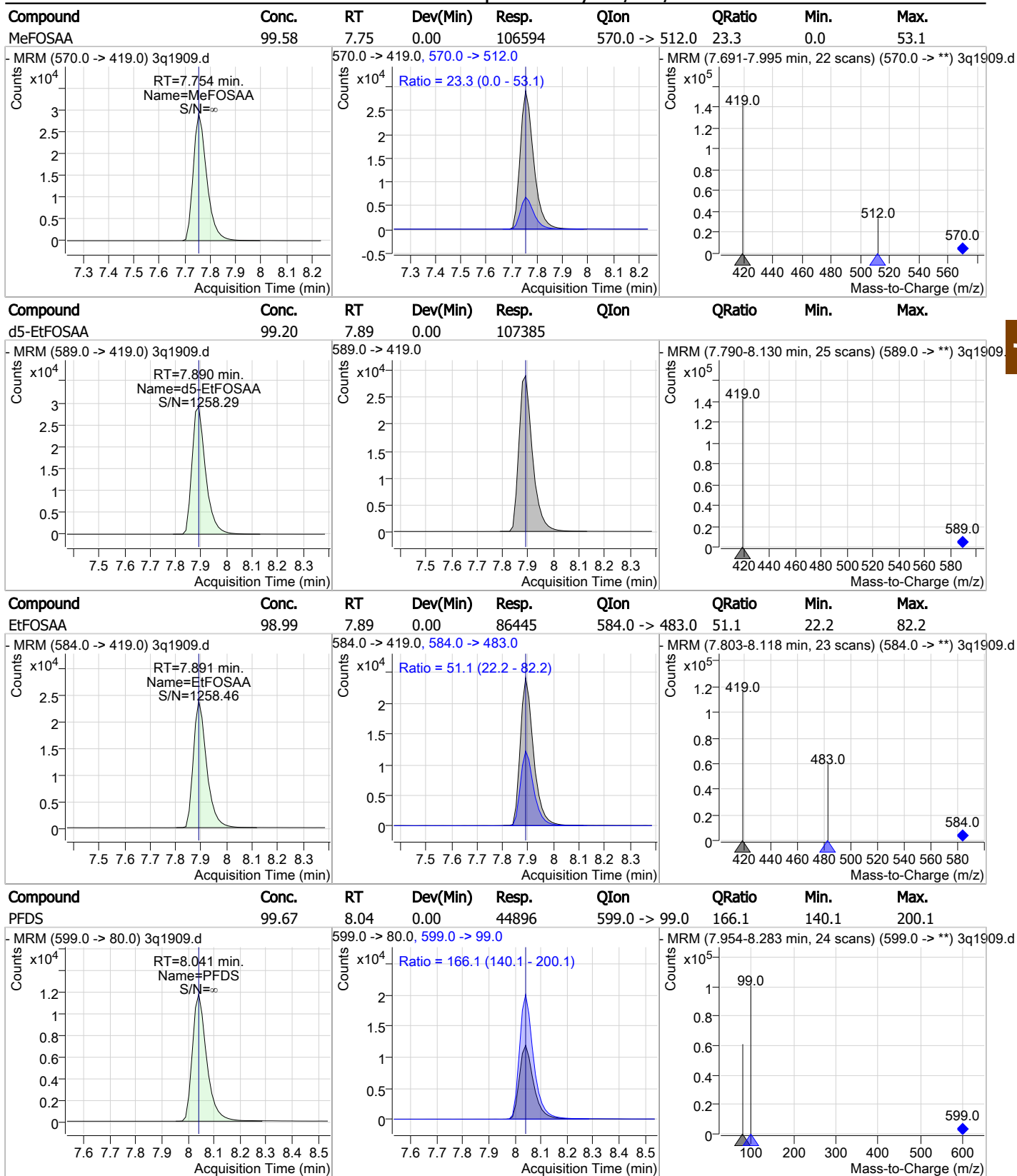
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	98.95	7.68	0.00	611005	513.0 -> 219.0	22.5	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	83.45	7.71	0.00	123177	527.0 -> 81.0	54.6	21.7	81.7



Perfluorinated Compounds by LC/MS/MS

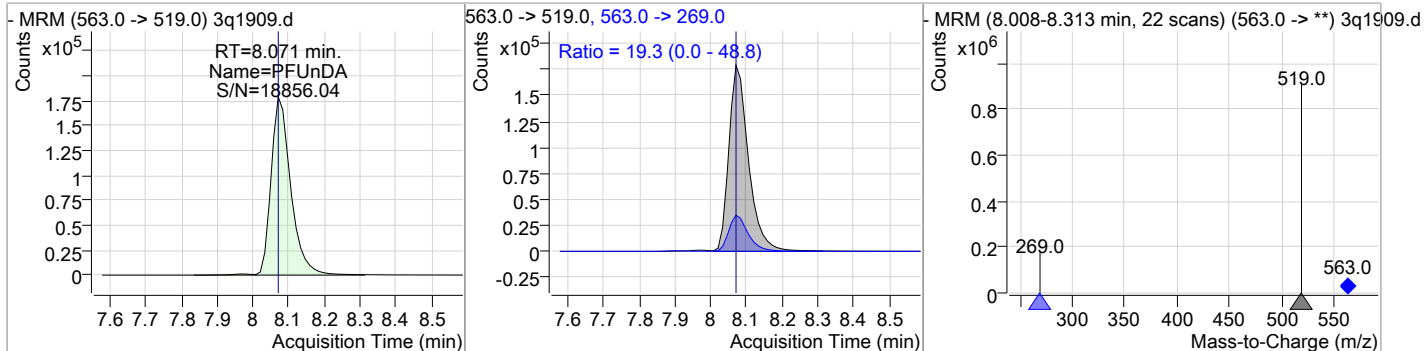


7.6.8

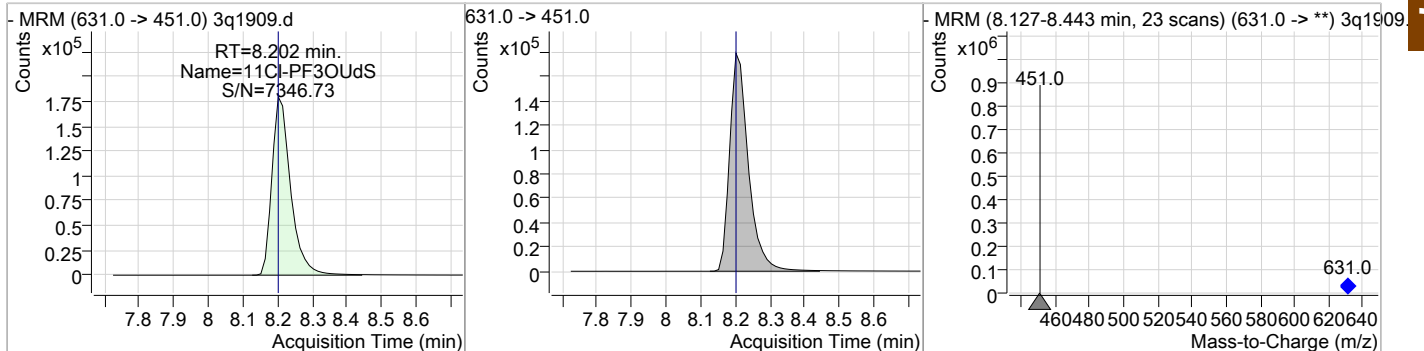


Perfluorinated Compounds by LC/MS/MS

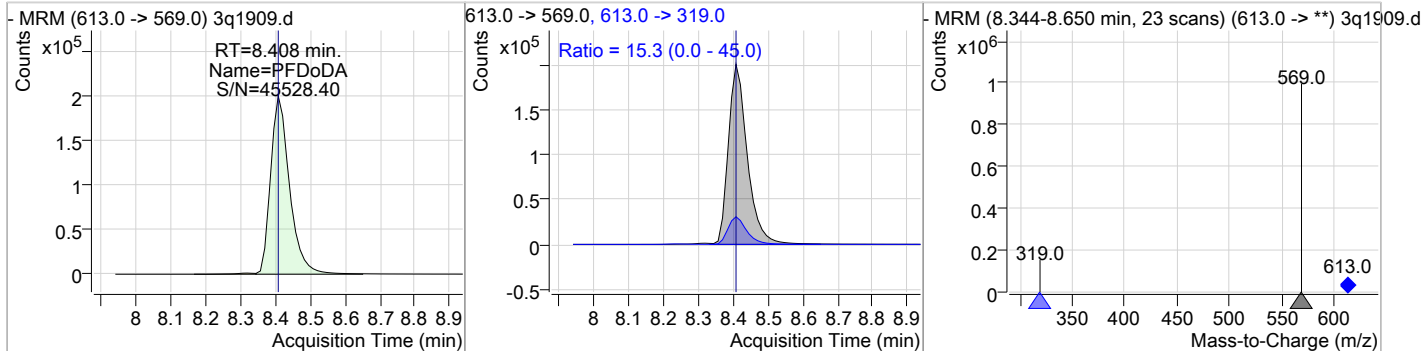
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	99.68	8.07	0.00	682031	563.0 -> 269.0	19.3	0.0	48.8



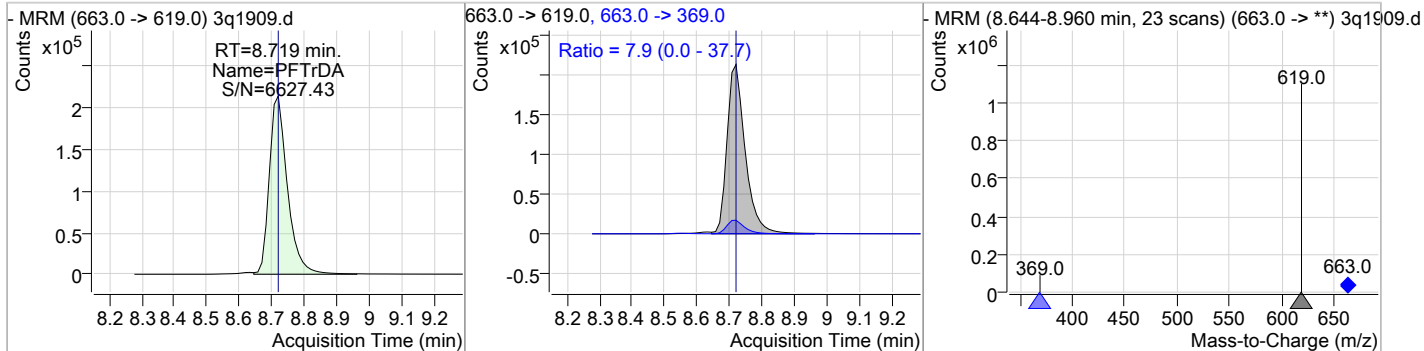
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	99.98	8.20	0.00	673782				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	100.06	8.41	0.00	755941	613.0 -> 319.0	15.3	0.0	45.0

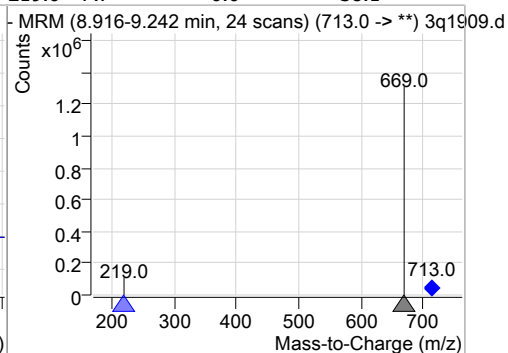
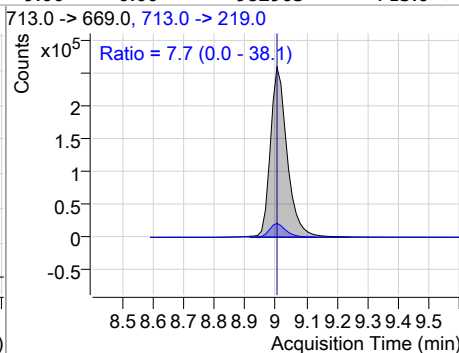
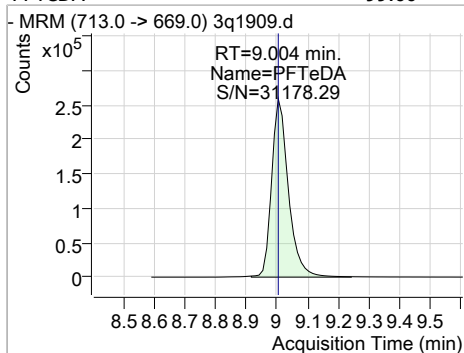


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	99.90	8.72	0.00	828108	663.0 -> 369.0	7.9	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	99.60	9.00	0.00	982963	713.0 -> 219.0	7.7	0.0	38.1



7.6.8
7

Manual Integration Approval Summary

Sample Number: S3Q52-IC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1909.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 14:21 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.8.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1910.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 2:36:29 PM
 Sample Name : ICV52-20
 Vial : P1-B1
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	43125	20.00 µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	186719	20.00 µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	197886	20.00 µg/L	0.000
13C3-PFPeA	3.572	266.0 -> 222.0	157273	20.00 µg/L	0.013
13C4-PFOS	7.191	503.0 -> 80.0	63053	20.00 µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	20959	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	-	515.0 -> 470.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.871	327.0 -> 307.0	48588	17.94 µg/L	QValue 97
6:2FTS	6.601	427.0 -> 407.0	41781	18.49 µg/L	98
8:2FTS	7.707	527.0 -> 507.0	26815	18.82 µg/L	95
EtFOSAA	7.891	584.0 -> 419.0	20123	20.60 µg/L	98
FOSA	7.321	498.0 -> 78.0	99630	19.96 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	23581	19.70 µg/L	99
PFBA	1.701	213.0 -> 169.0	63626	17.84 µg/L	100
PFBS	3.878	299.0 -> 80.0	59031	15.50 µg/L	98
PFDA	7.684	513.0 -> 469.0	142617	19.08 µg/L	100
PFDoDA	8.408	613.0 -> 569.0	178454	19.93 µg/L	99
PFDS	8.041	599.0 -> 80.0	9821	18.17 µg/L	99
PFHpA	5.902	363.0 -> 319.0	286430	19.26 µg/L	99
PFHpS	6.621	449.0 -> 80.0	45343	18.07 µg/L	98
PFHxA	4.975	313.0 -> 269.0	88443	16.52 µg/L	99
PFHxS	5.944	399.0 -> 80.0	46693	16.43 µg/L	m 98
PFNA	7.208	463.0 -> 419.0	165534	17.64 µg/L	99
PFNS	7.667	549.0 -> 80.0	39936	18.85 µg/L	98
PFOA	6.618	413.0 -> 369.0	166496	19.03 µg/L	99
PFOS	7.192	499.0 -> 80.0	71144	18.57 µg/L	m 87
PFPeA	3.575	263.0 -> 219.0	198189	17.94 µg/L	100
PFPeS	5.105	349.0 -> 80.0	35028	15.83 µg/L	99
PFTeDA	9.004	713.0 -> 669.0	209545	17.91 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	209006	21.27 µg/L	99
PFUnDA	8.084	563.0 -> 519.0	162188	20.00 µg/L	99
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.6.9
7

Perfluorinated Compounds by LC/MS/MS

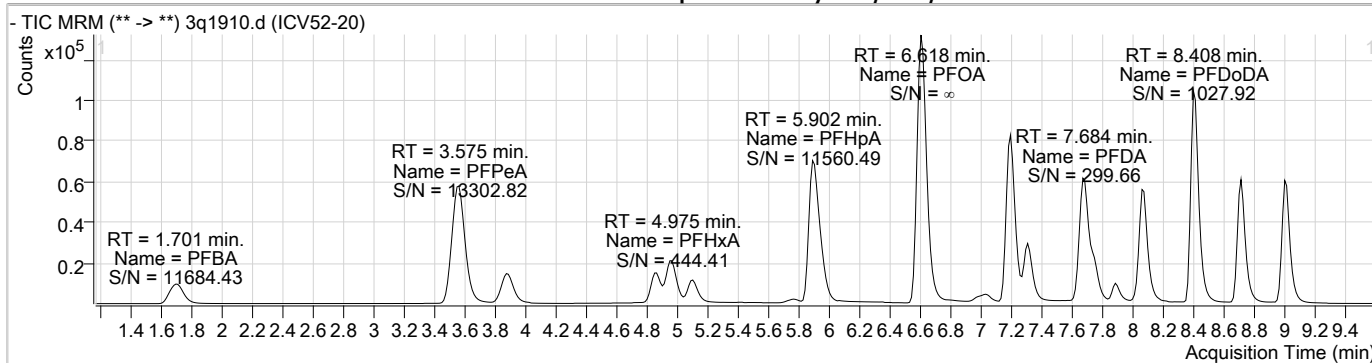
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

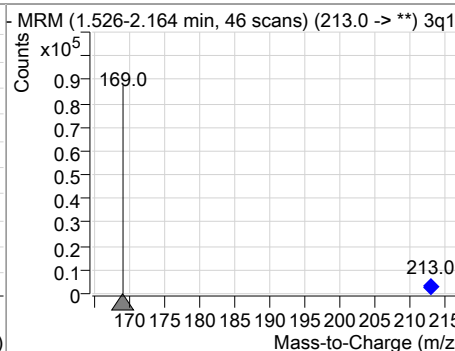
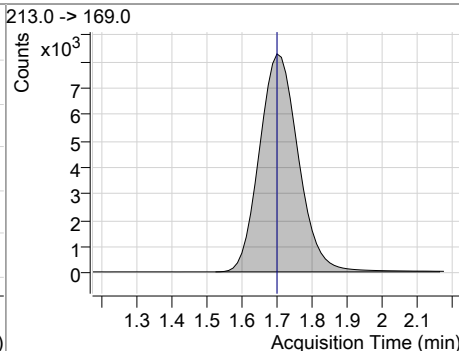
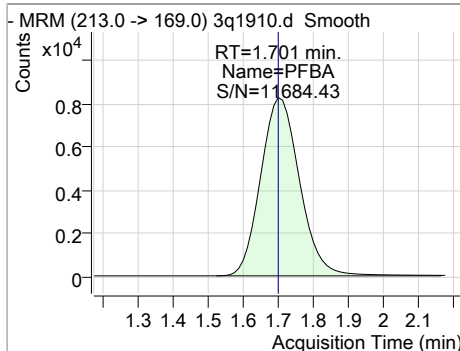
7.6.9

7

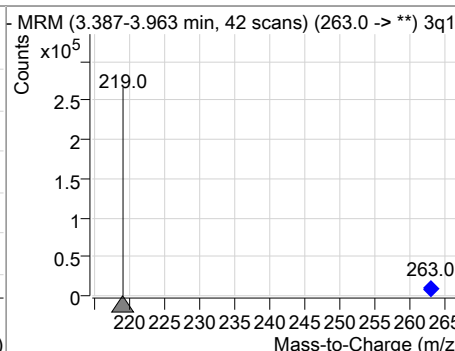
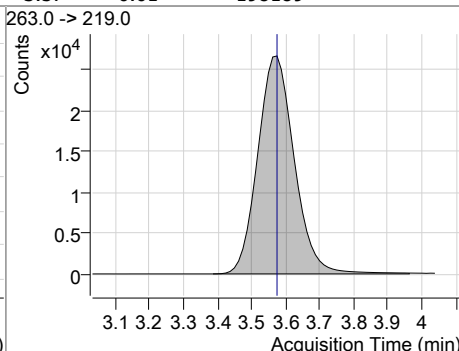
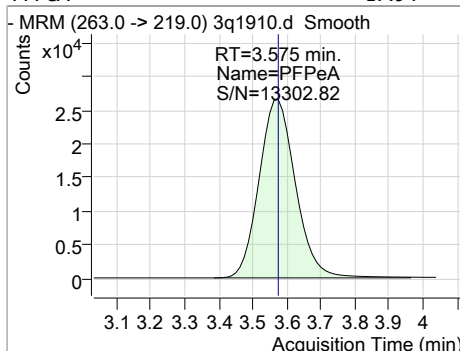
Perfluorinated Compounds by LC/MS/MS



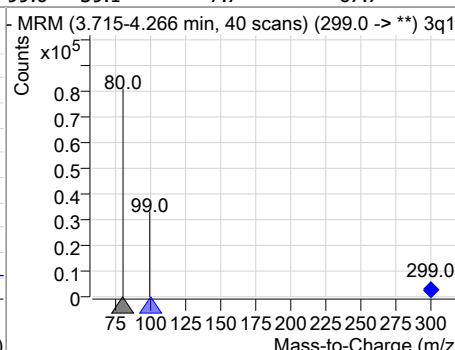
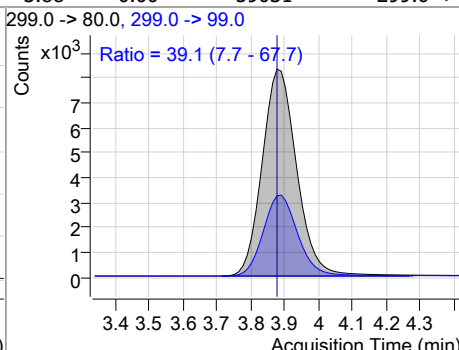
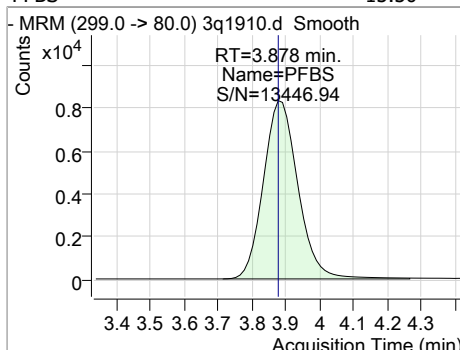
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	17.84	1.70	0.00	63626				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	17.94	3.57	0.01	198189				

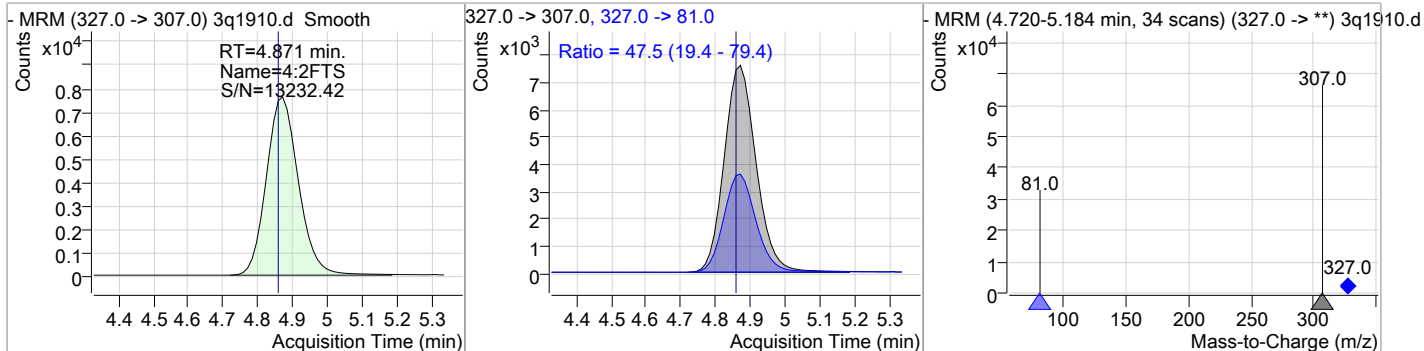


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	15.50	3.88	0.00	59031	299.0 -> 99.0	39.1	7.7	67.7

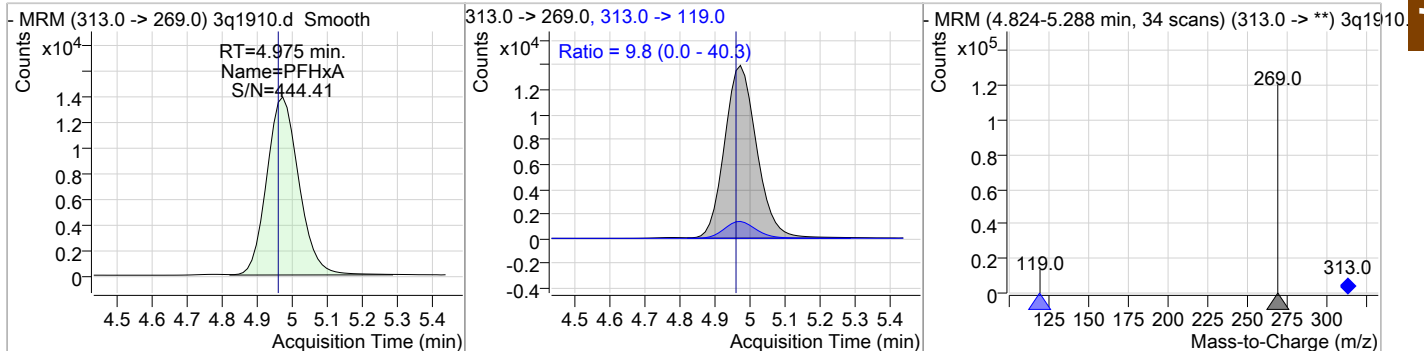


Perfluorinated Compounds by LC/MS/MS

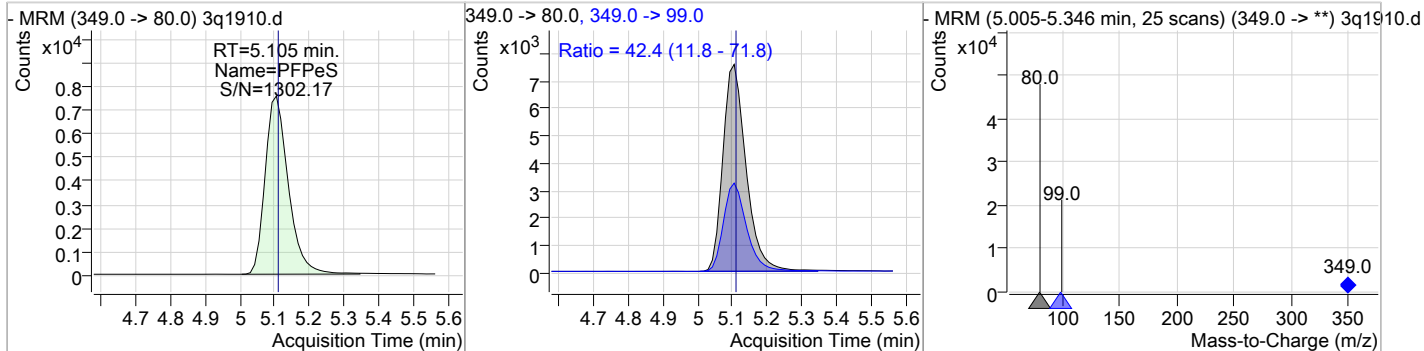
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	17.94	4.87	0.01	48588	327.0 -> 81.0	47.5	19.4	79.4



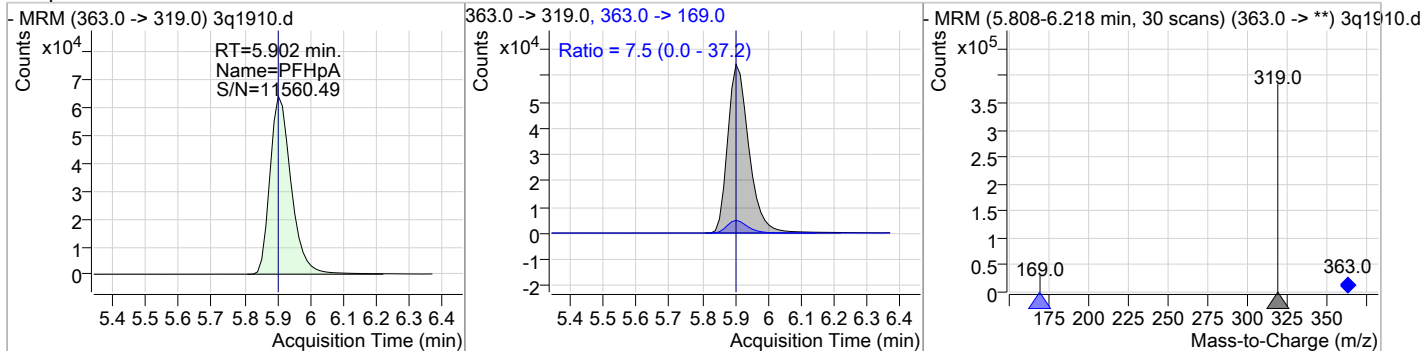
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	16.52	4.97	0.01	88443	313.0 -> 119.0	9.8	0.0	40.3



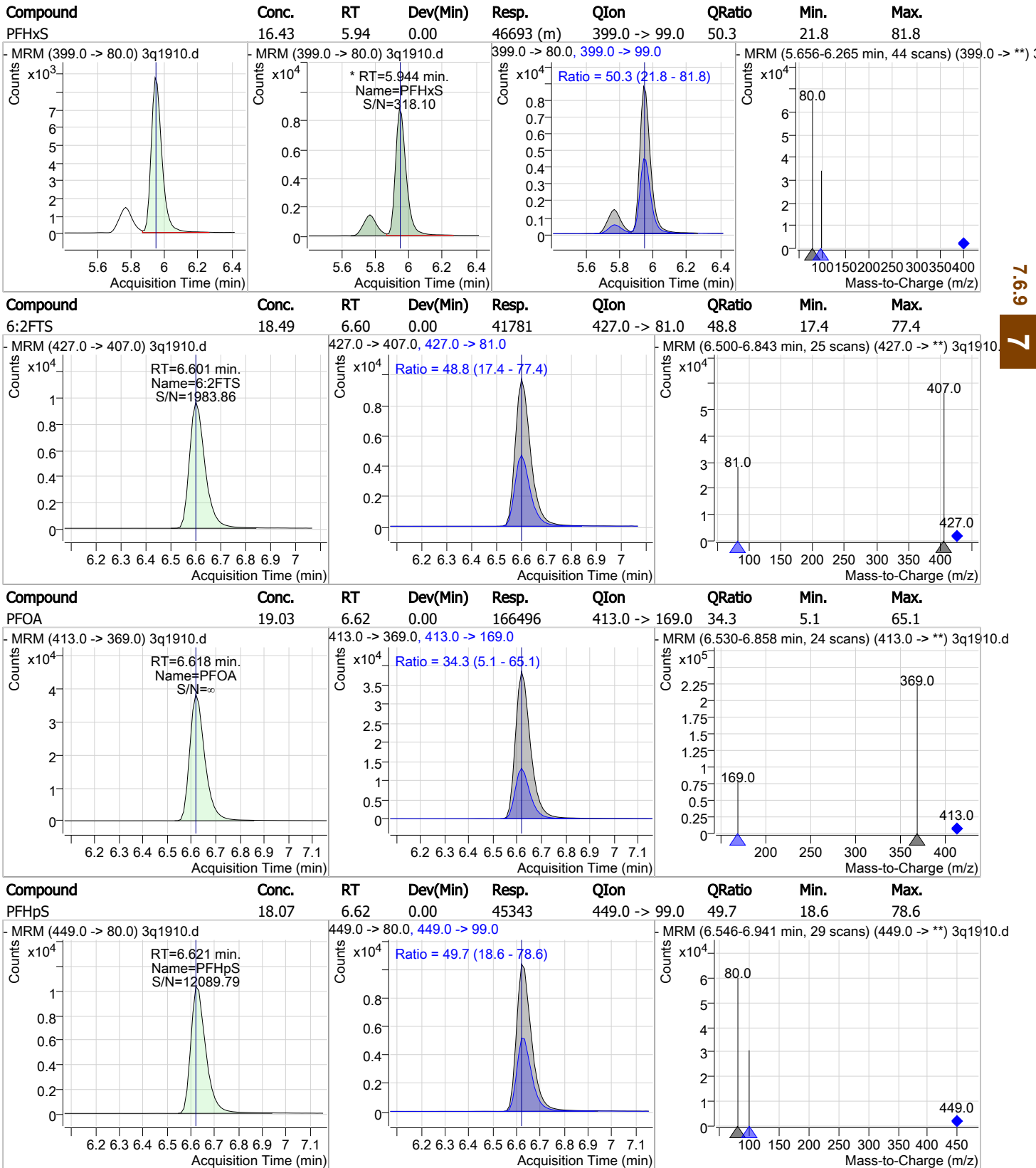
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	15.83	5.11	0.01	35028	349.0 -> 99.0	42.4	11.8	71.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	19.26	5.90	0.00	286430	363.0 -> 169.0	7.5	0.0	37.2



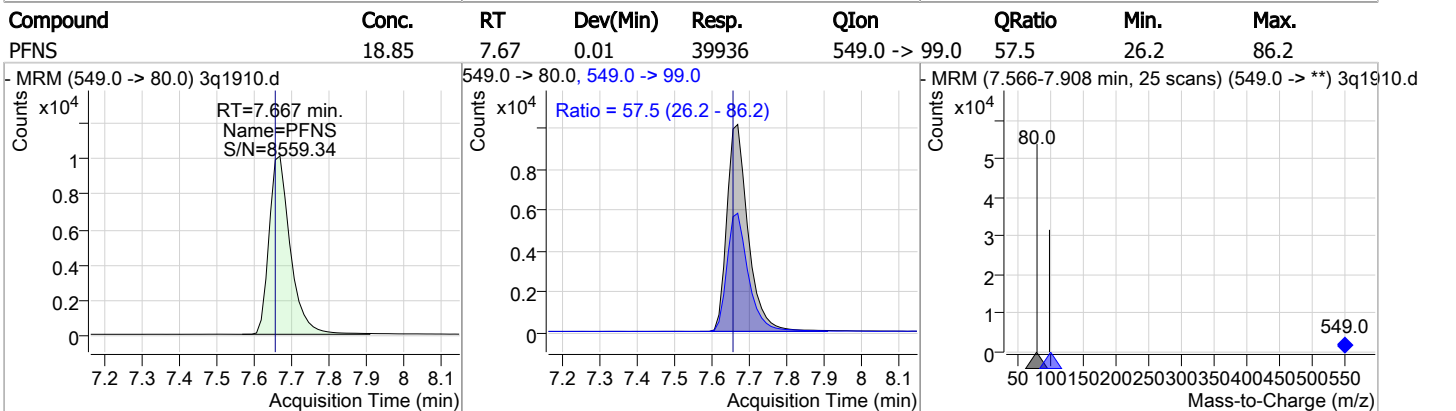
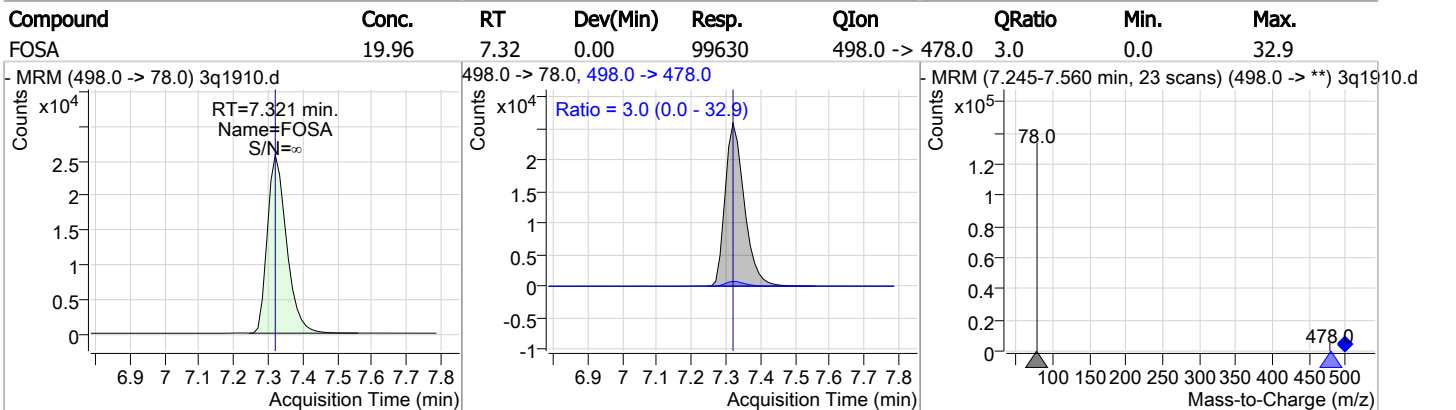
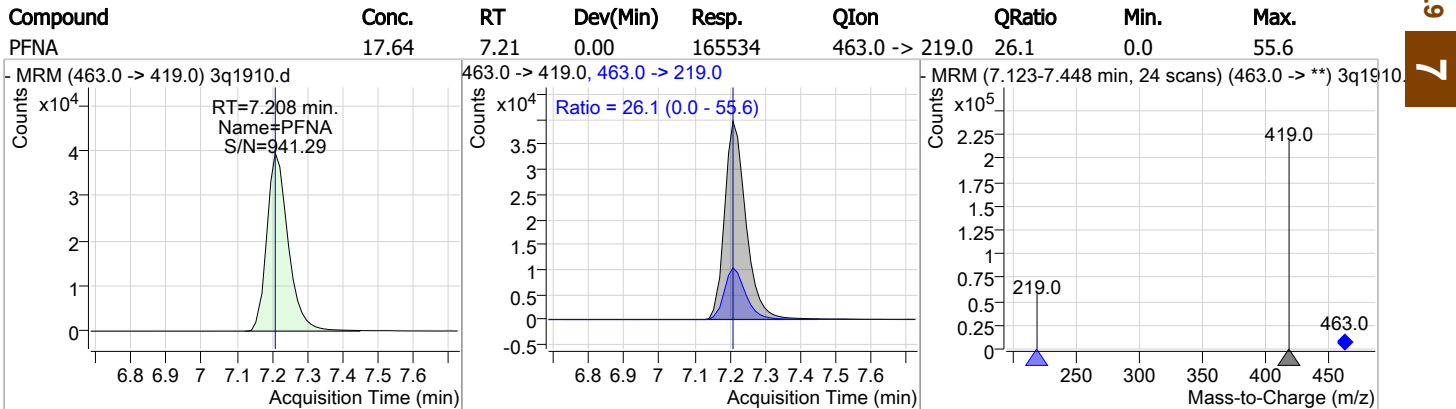
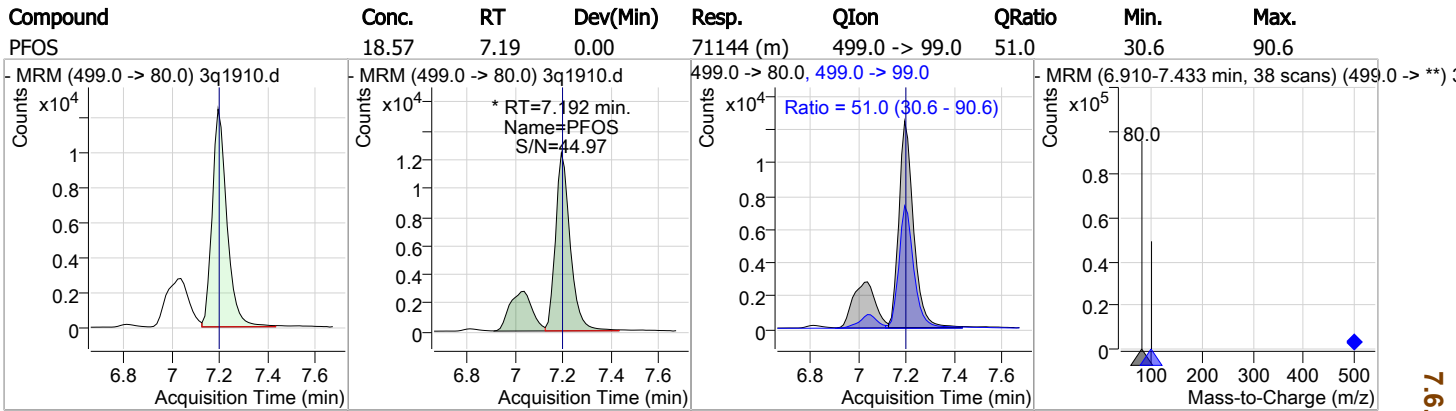
Perfluorinated Compounds by LC/MS/MS



7.6.9
7

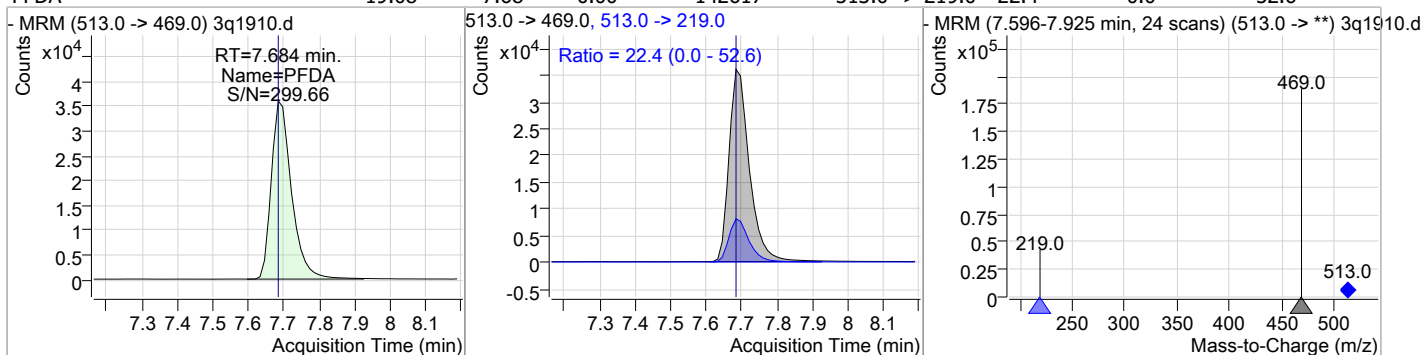


Perfluorinated Compounds by LC/MS/MS

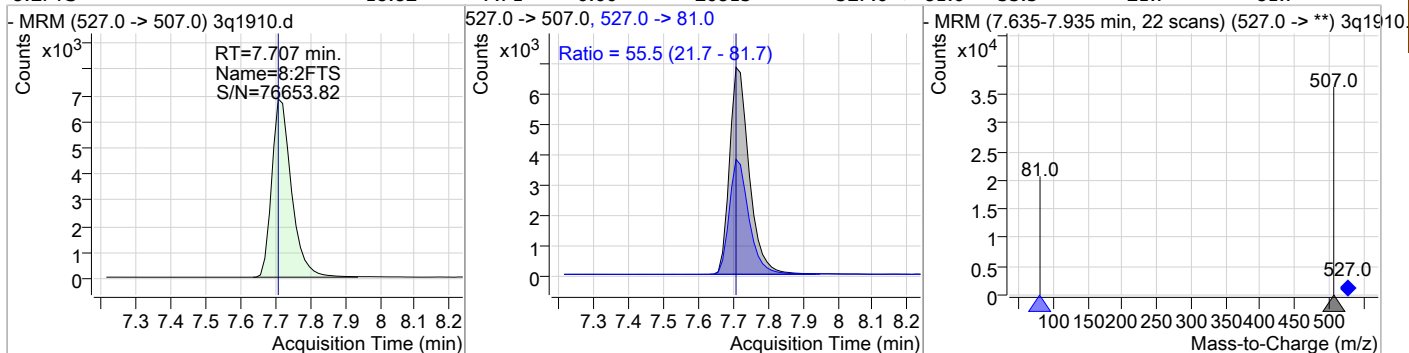


Perfluorinated Compounds by LC/MS/MS

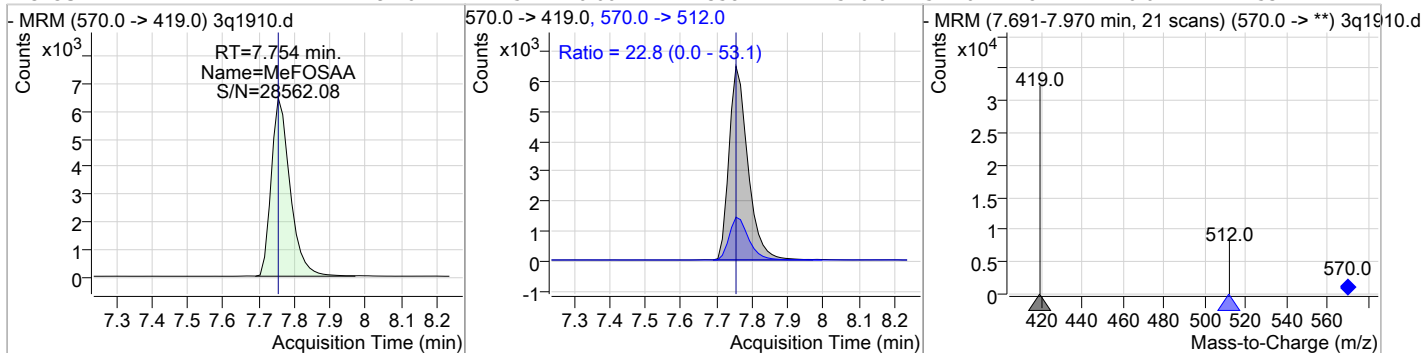
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	19.08	7.68	0.00	142617	513.0 -> 219.0	22.4	0.0	52.6



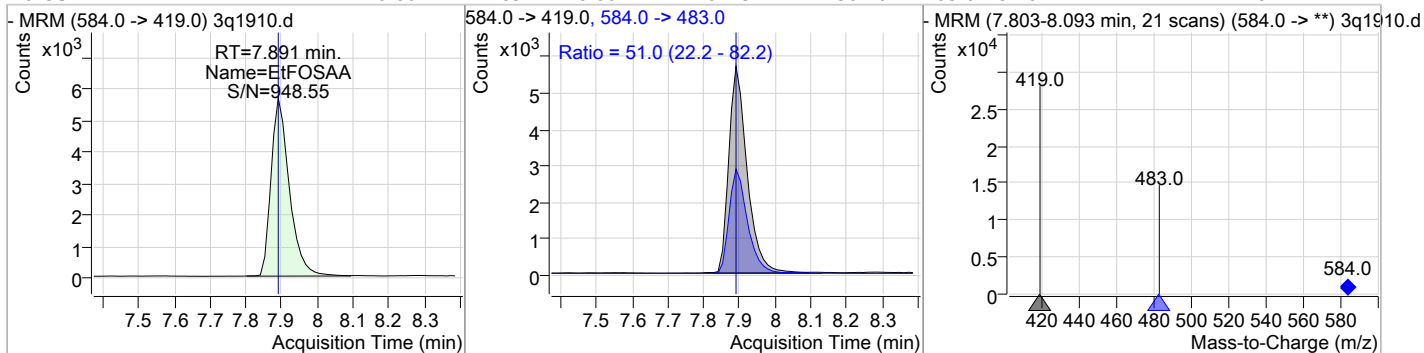
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	18.82	7.71	0.00	26815	527.0 -> 81.0	55.5	21.7	81.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	19.70	7.75	0.00	23581	570.0 -> 512.0	22.8	0.0	53.1

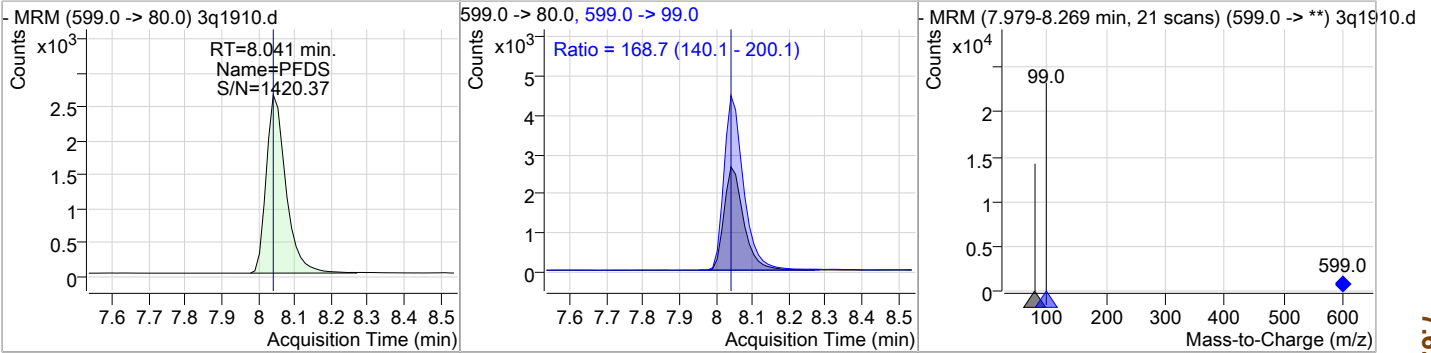


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	20.60	7.89	0.00	20123	584.0 -> 483.0	51.0	22.2	82.2

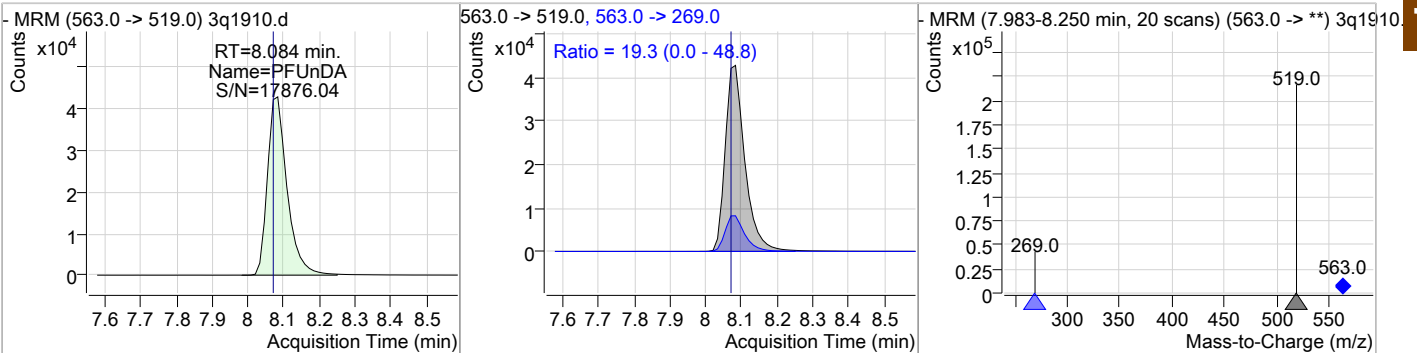


Perfluorinated Compounds by LC/MS/MS

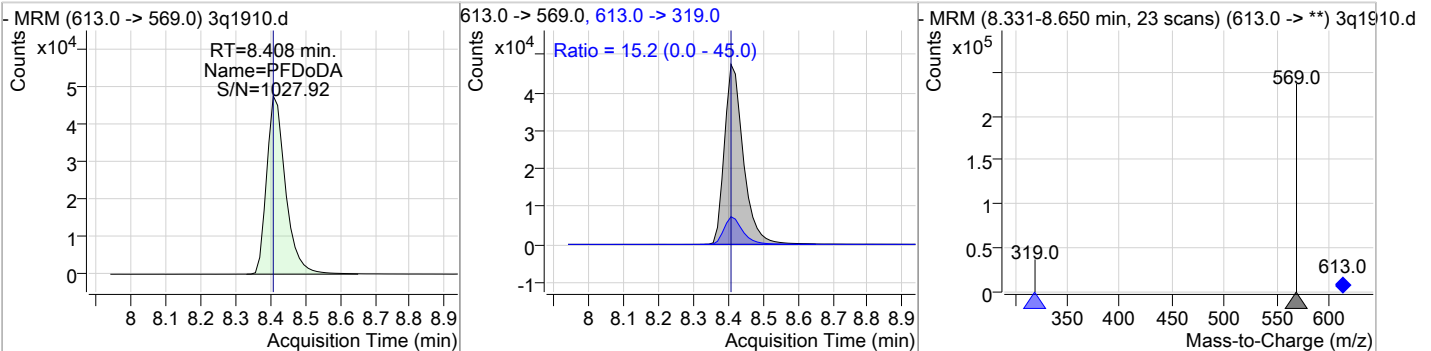
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	18.17	8.04	0.00	9821	599.0 -> 99.0	168.7	140.1	200.1



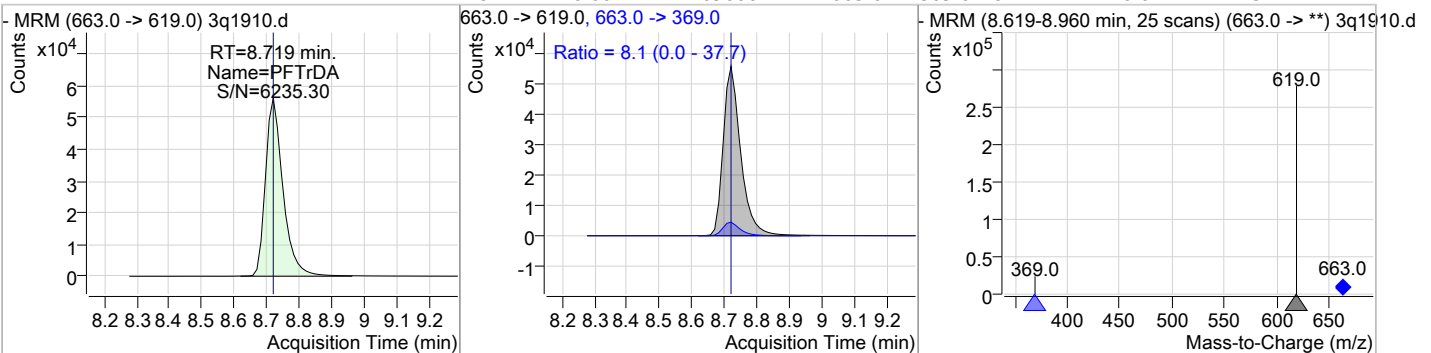
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	20.00	8.08	0.01	162188	563.0 -> 269.0	19.3	0.0	48.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.93	8.41	0.00	178454	613.0 -> 319.0	15.2	0.0	45.0

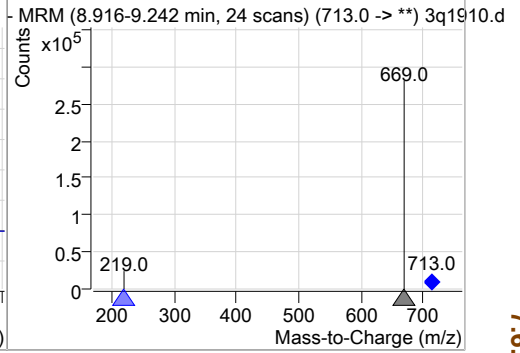
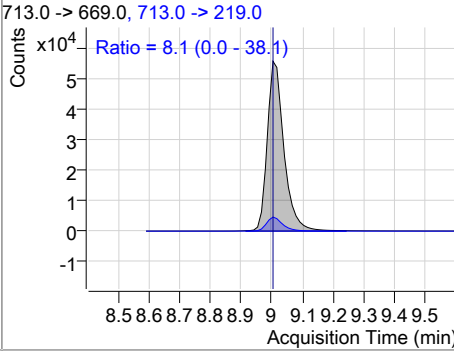
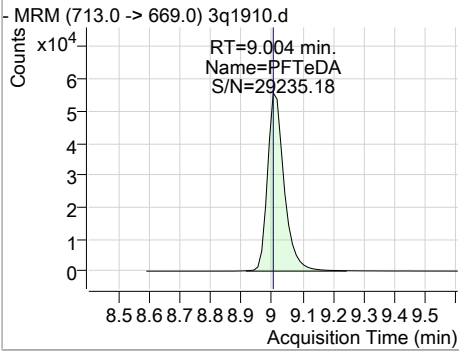


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	21.27	8.72	0.00	209006	663.0 -> 369.0	8.1	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	17.91	9.00	0.00	209545	713.0 -> 219.0	8.1	0.0	38.1



7.6.9
7

Manual Integration Approval Summary

Sample Number: S3Q52-ICV52 **Method:** EPA 537 MOD
Lab FileID: 3Q1910.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 14:36 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.9.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1911.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 2:51:50 PM
 Sample Name : ICV52-20
 Vial : P1-B2
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	38829	20.00	µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	176407	20.00	µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	187494	20.00	µg/L	0.000
13C3-PFPeA	3.572	266.0 -> 222.0	145839	20.00	µg/L	0.013
13C4-PFOS	7.191	503.0 -> 80.0	58421	20.00	µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	20293	20.00	µg/L	0.000

System Monitoring Compounds

13C2-PFDA	-	515.0 -> 470.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	

Target Compounds

Compound	RT	QIon	Resp.	Conc.	Units	QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.		
6:2FTS	-	427.0 -> 407.0	-	N.D.		
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	7.891	584.0 -> 419.0	16409	17.35	µg/L m	99
FOSA	-	498.0 -> 78.0	-	N.D.		
MeFOSAA	7.754	570.0 -> 419.0	19012	16.40	µg/L m	95
PFBA	-	213.0 -> 169.0	-	N.D.		
PFBS	3.878	299.0 -> 80.0	60890	17.25	µg/L	98
PFDA	7.684	513.0 -> 469.0	141394	19.96	µg/L	99
PFDoDA	8.408	613.0 -> 569.0	152149	17.98	µg/L	100
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	5.902	363.0 -> 319.0	245380	17.41	µg/L	99
PFHpS	-	449.0 -> 80.0	-	N.D.		
PFHxA	4.975	313.0 -> 269.0	85872	16.93	µg/L	99
PFHxS	5.944	399.0 -> 80.0	48647	18.47	µg/L m	96
PFNA	7.208	463.0 -> 419.0	165106	18.57	µg/L	99
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.618	413.0 -> 369.0	154280	18.61	µg/L	98
PFOS	7.192	499.0 -> 80.0	63903	18.01	µg/L m	82
PFPeA	-	263.0 -> 219.0	-	N.D.		
PFPeS	-	349.0 -> 80.0	-	N.D.		
PFTeDA	9.004	713.0 -> 669.0	202866	18.35	µg/L	100
PFTrDA	8.719	663.0 -> 619.0	174203	18.76	µg/L	99
PFUnDA	8.084	563.0 -> 519.0	147173	19.21	µg/L	99
ADONA	6.012	377.0 -> 251.0	346263	17.19	µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	35686	18.09	µg/L	100
11Cl-PF3OUdS	8.215	631.0 -> 451.0	144155	18.65	µg/L	100
HFPO-DA	5.270	329.0 -> 169.0	48848	19.80	µg/L	99

7.6.10
7

Perfluorinated Compounds by LC/MS/MS

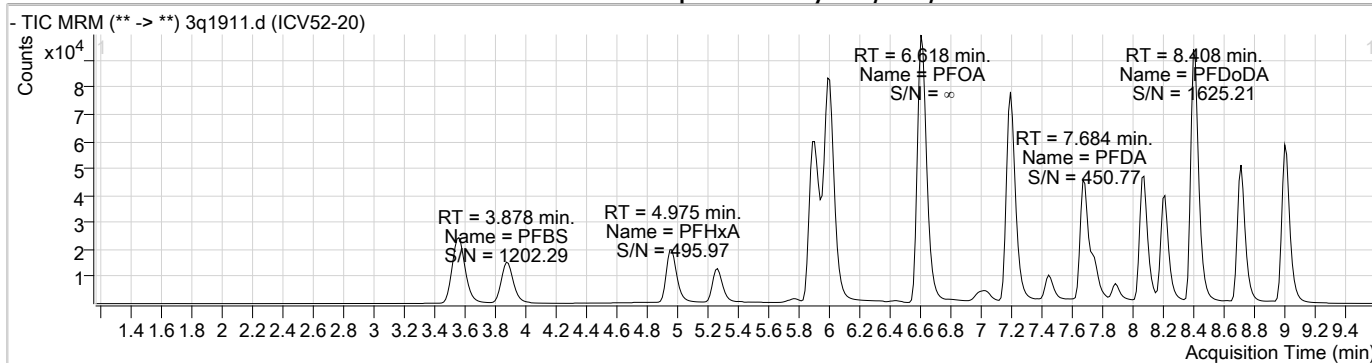
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

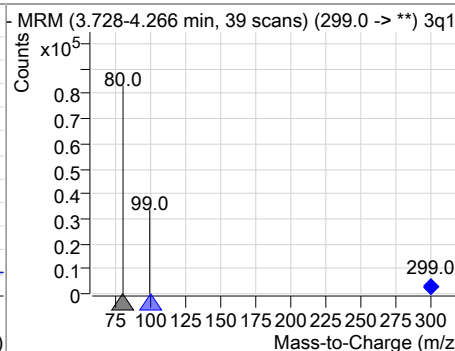
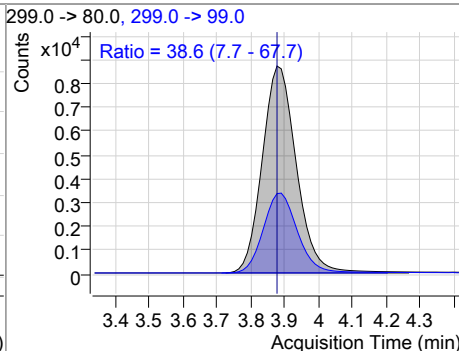
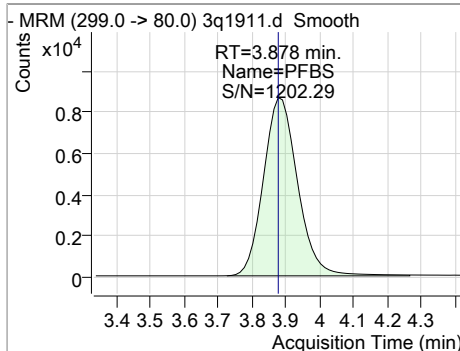
7.6.10

7

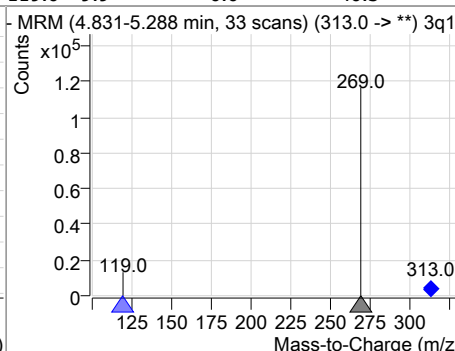
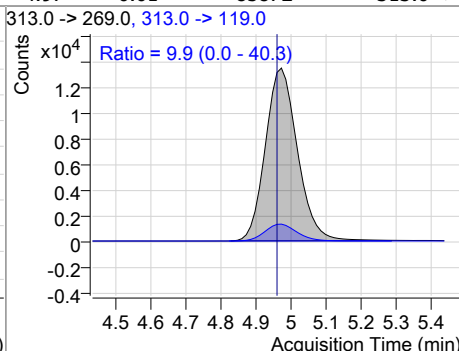
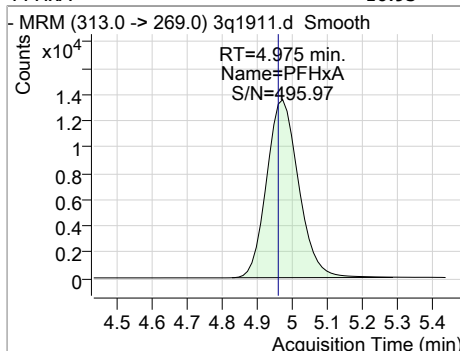
Perfluorinated Compounds by LC/MS/MS



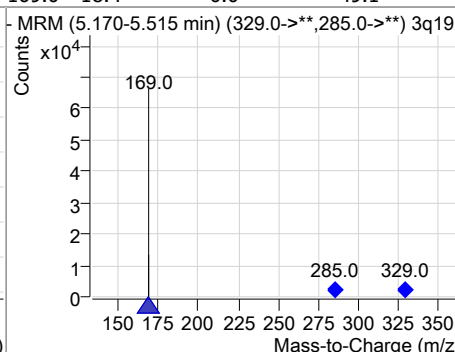
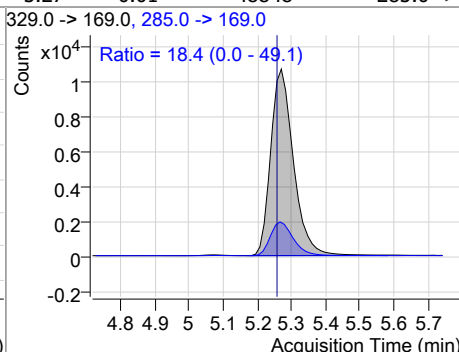
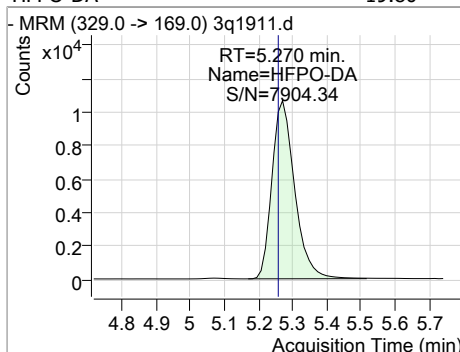
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	17.25	3.88	0.00	60890	299.0 -> 99.0	38.6	7.7	67.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	16.93	4.97	0.01	85872	313.0 -> 119.0	9.9	0.0	40.3

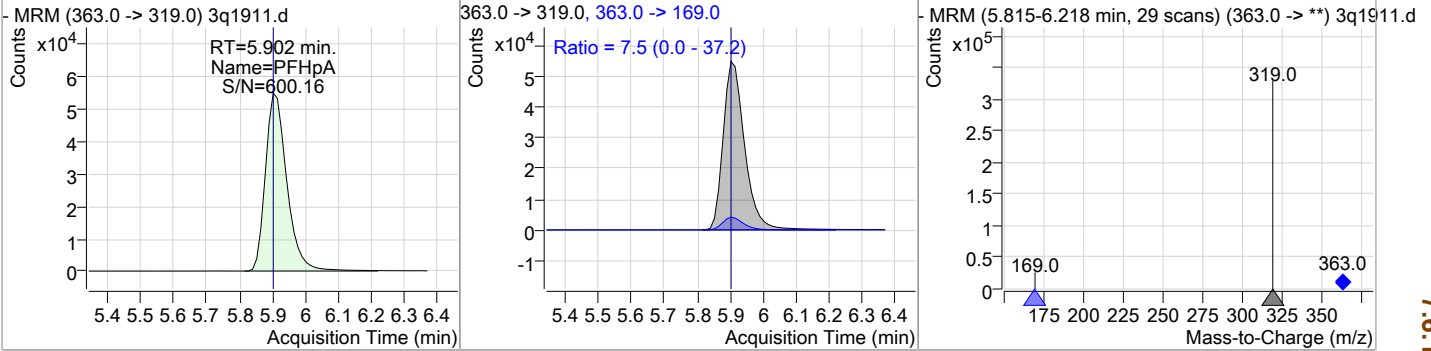


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	19.80	5.27	0.01	48848	285.0 -> 169.0	18.4	0.0	49.1

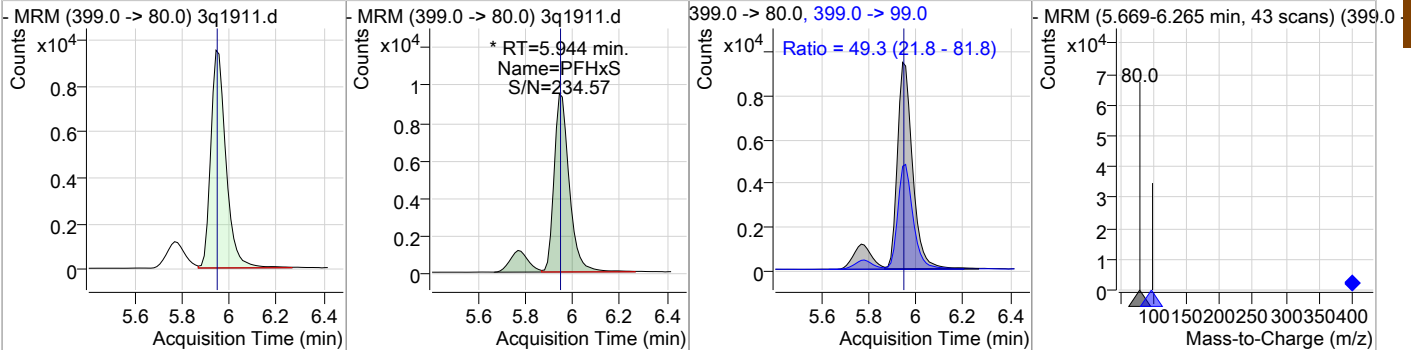


Perfluorinated Compounds by LC/MS/MS

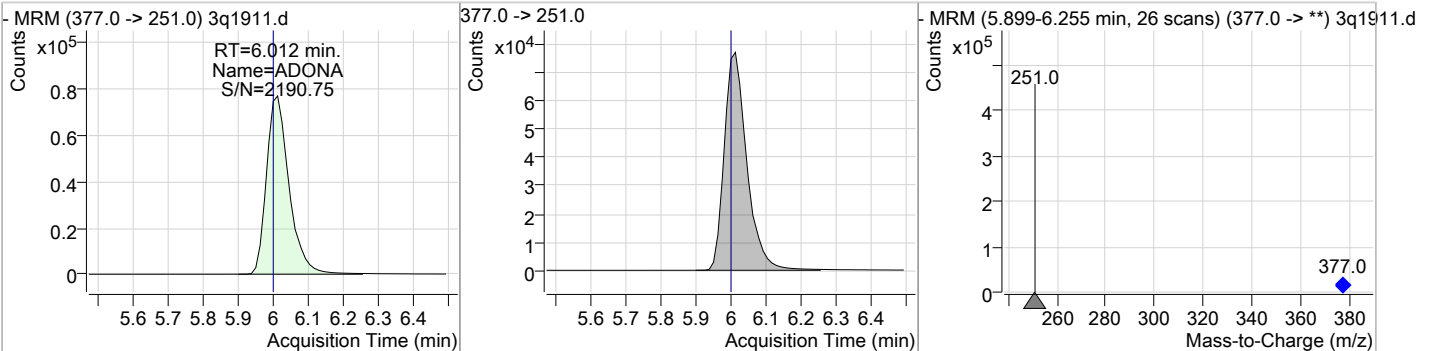
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	17.41	5.90	0.00	245380	363.0 -> 169.0	7.5	0.0	37.2



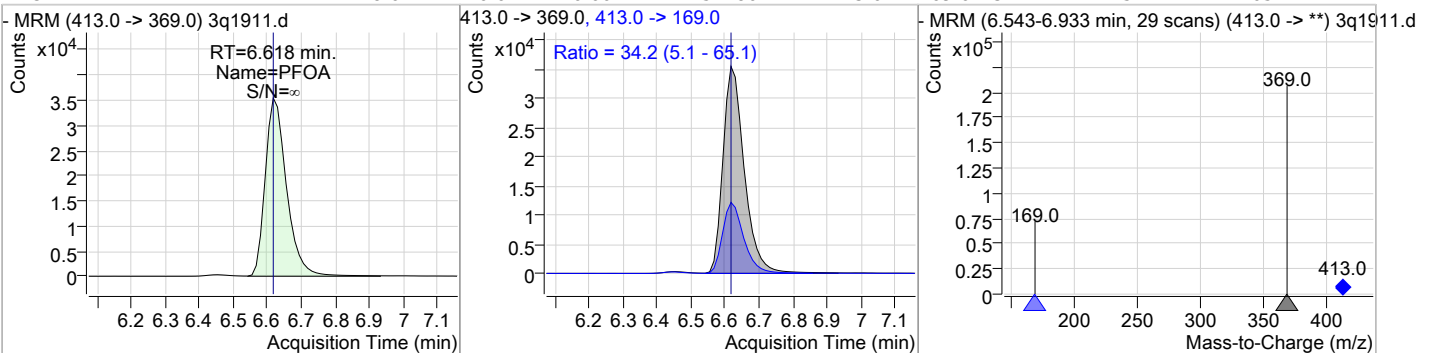
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	18.47	5.94	0.00	48647 (m)	399.0 -> 99.0	49.3	21.8	81.8



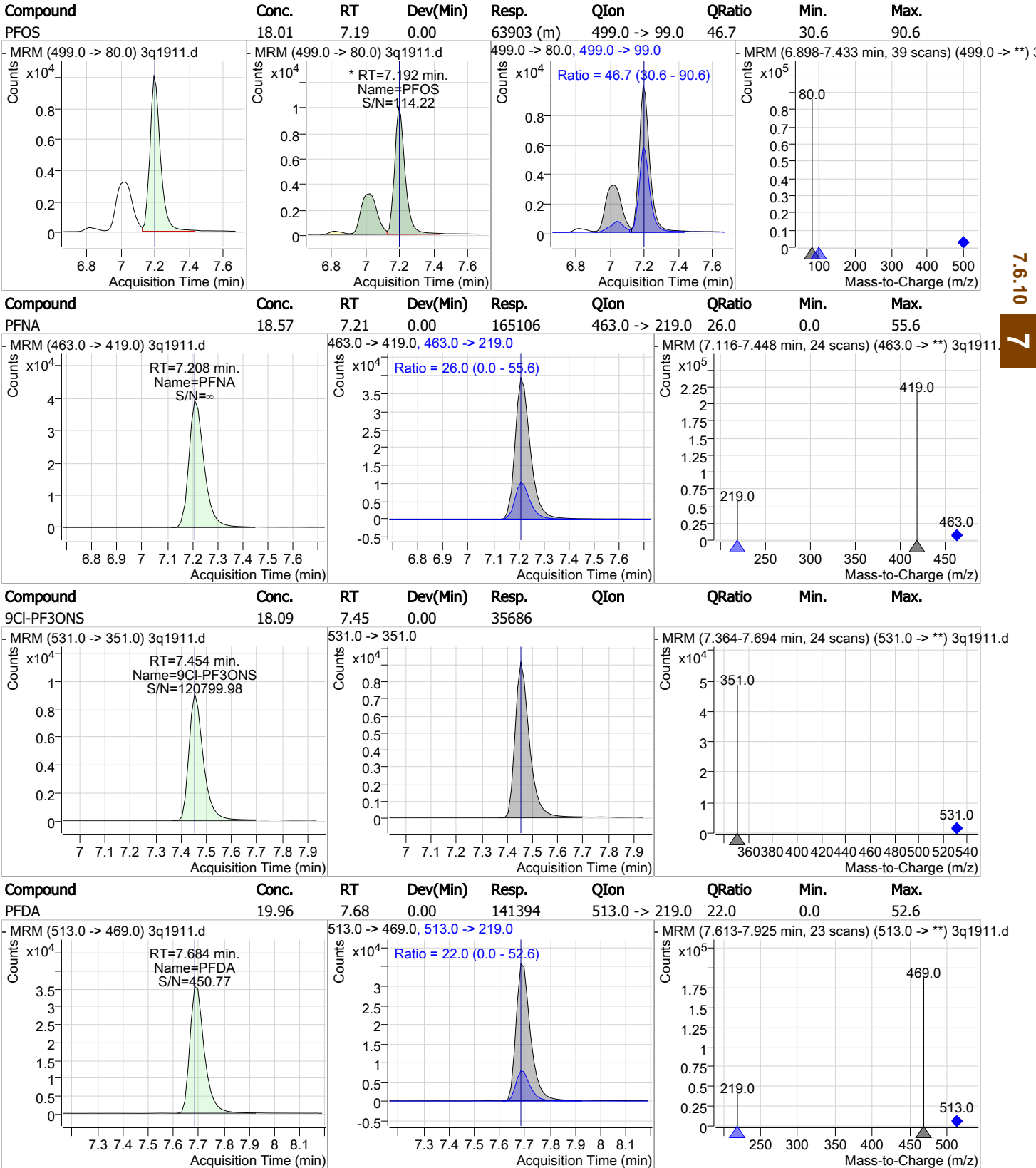
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
ADONA	17.19	6.01	0.01	346263	377.0 -> 251.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	18.61	6.62	0.00	154280	413.0 -> 169.0	34.2	5.1	65.1



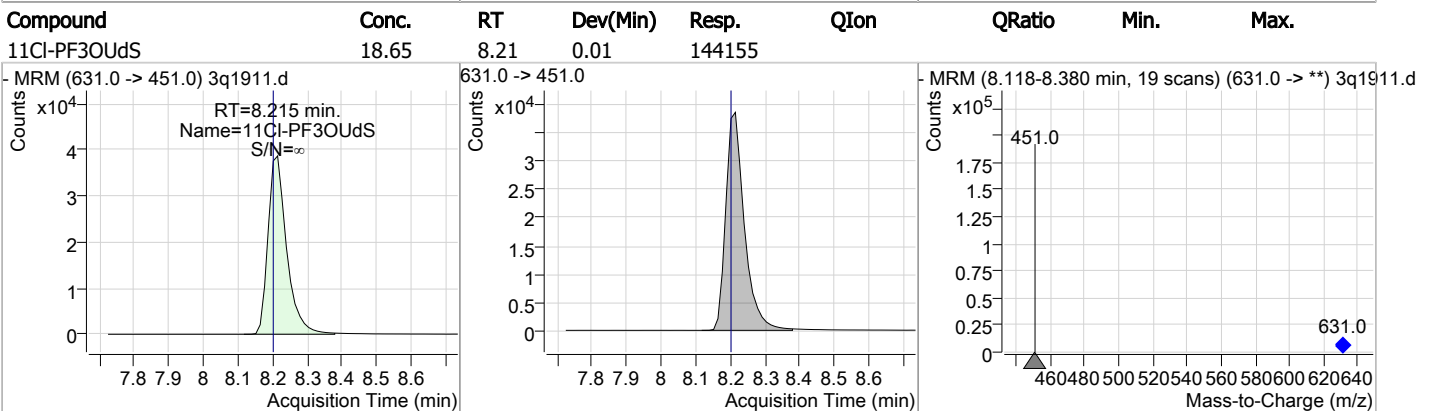
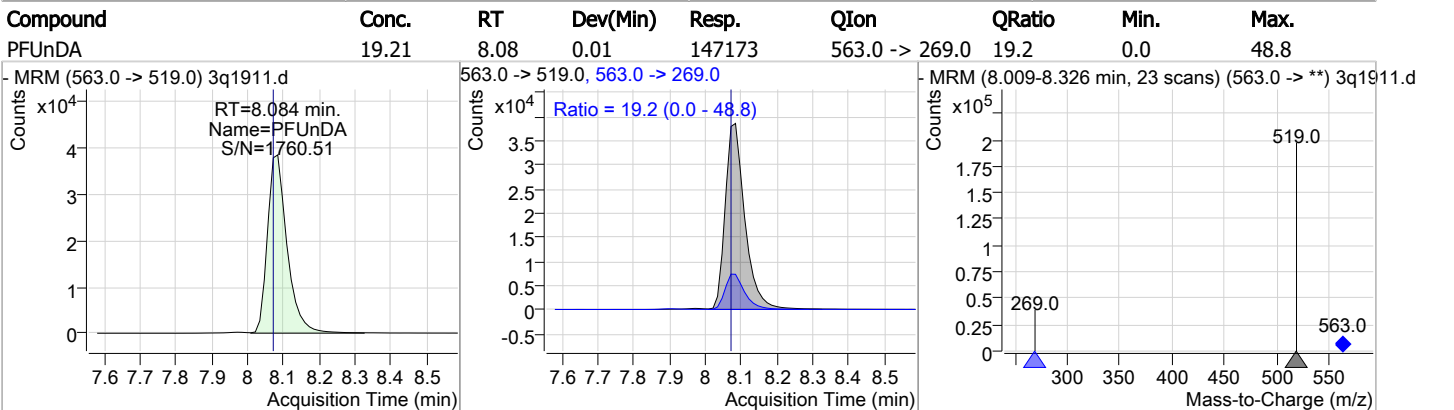
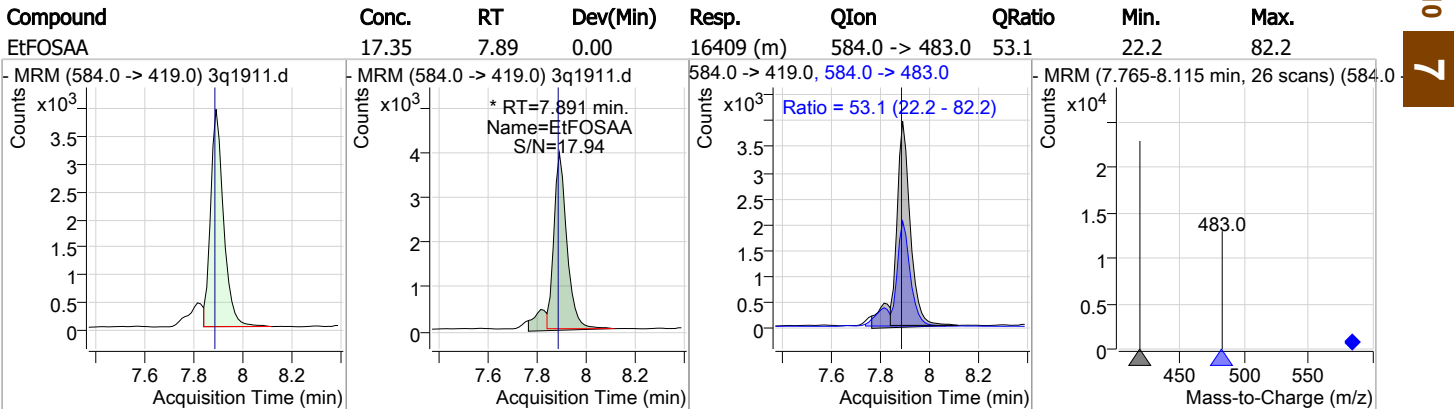
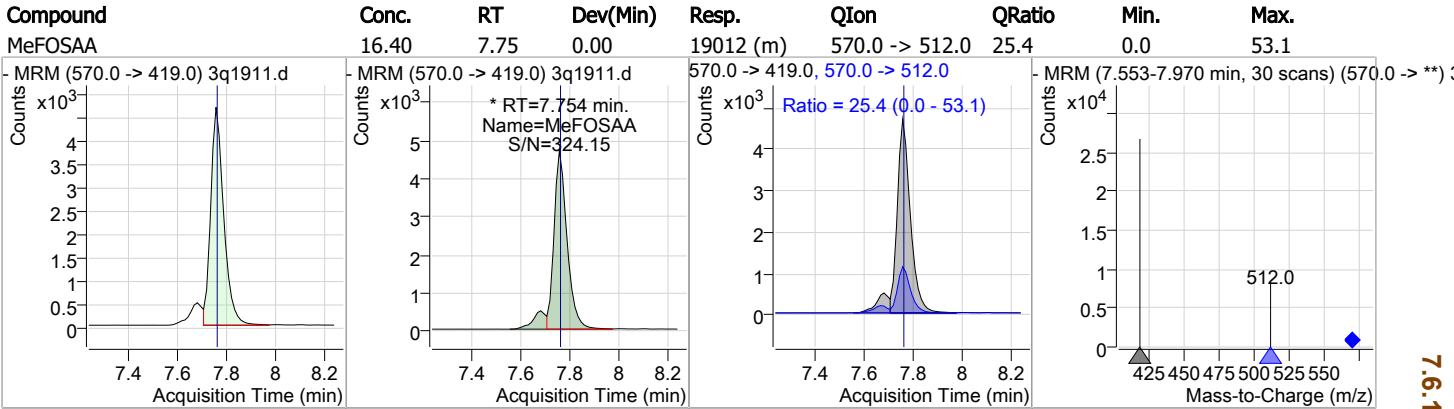
Perfluorinated Compounds by LC/MS/MS



7.6.10 7

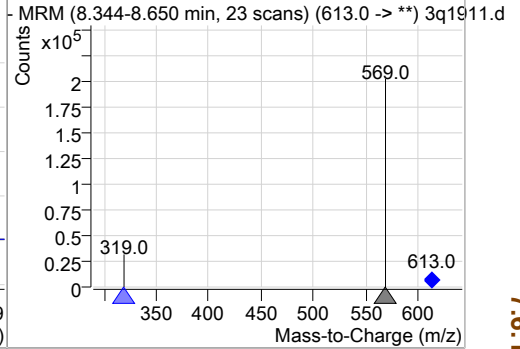
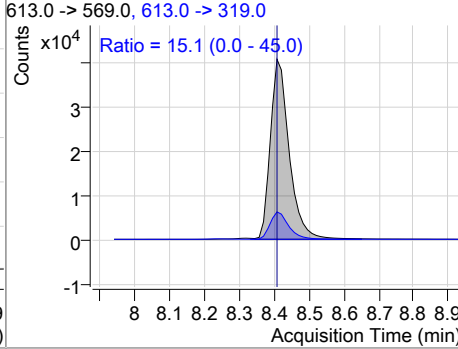
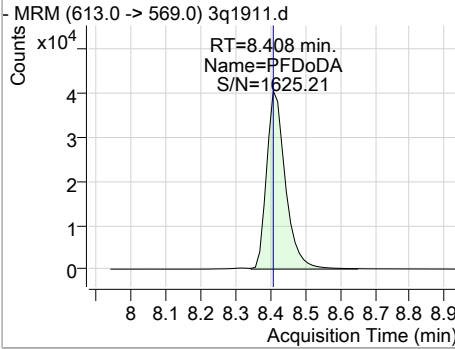


Perfluorinated Compounds by LC/MS/MS

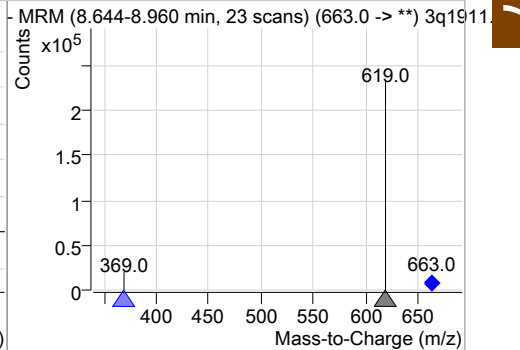
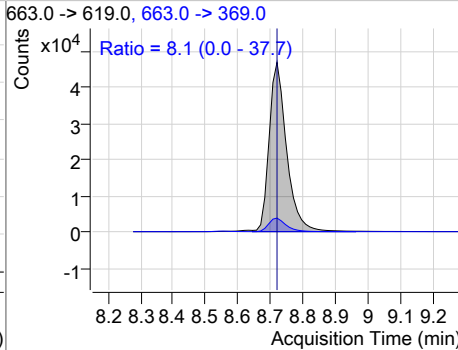
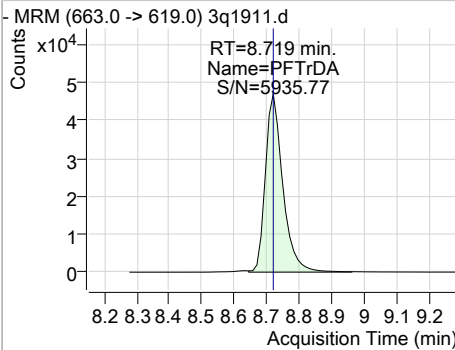


Perfluorinated Compounds by LC/MS/MS

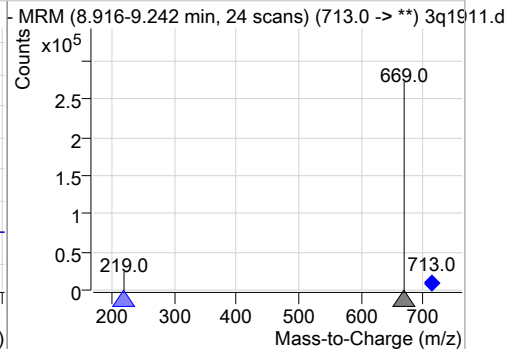
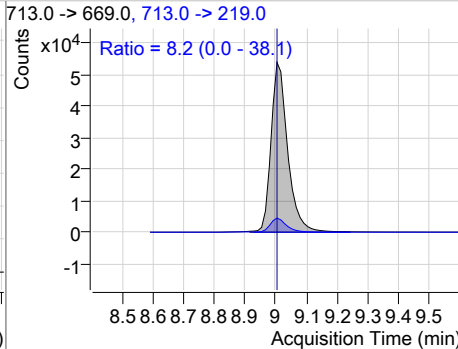
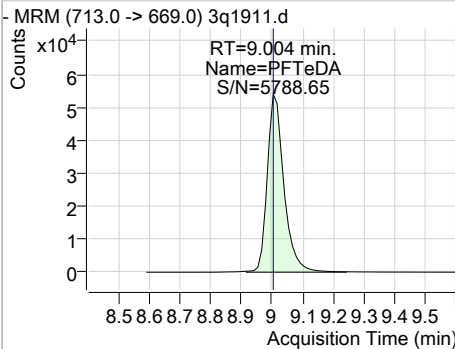
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	17.98	8.41	0.00	152149	613.0 -> 319.0	15.1	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	18.76	8.72	0.00	174203	663.0 -> 369.0	8.1	0.0	37.7



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	18.35	9.00	0.00	202866	713.0 -> 219.0	8.2	0.0	38.1



7.6.10
7



Manual Integration Approval Summary

Sample Number: S3Q52-ICV52 **Method:** EPA 537 MOD
Lab FileID: 3Q1911.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 14:51 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
MeFOSAA	2355-31-9		7.75	Split peak
EtFOSAA	2991-50-6		7.89	Split peak

7.6.10.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1912.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 3:07:10 PM
 Sample Name : ICV52-20
 Vial : P1-B3
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.599	429.0 -> 409.0	37997	20.00	µg/L	0.000
13C2-PFDoDA	8.407	615.0 -> 570.0	176794	20.00	µg/L	0.000
13C2-PFOA	6.616	415.0 -> 370.0	186852	20.00	µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	144732	20.00	µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	57641	20.00	µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	19497	20.00	µg/L	0.000

System Monitoring Compounds

13C2-PFDA	-	515.0 -> 470.0	-	N.D.		
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.		
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.		
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = NA%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.		
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = NA%			

Target Compounds

Compound	RT	QIon	Resp.	Conc.	Units	QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.		
6:2FTS	-	427.0 -> 407.0	-	N.D.		
8:2FTS	-	527.0 -> 507.0	-	N.D.		
EtFOSAA	7.891	584.0 -> 419.0	14336	15.78	µg/L m	96
FOSA	-	498.0 -> 78.0	-	N.D.		
MeFOSAA	7.754	570.0 -> 419.0	18707	16.80	µg/L m	95
PFBA	-	213.0 -> 169.0	-	N.D.		
PFBS	-	299.0 -> 80.0	-	N.D.		
PFDA	-	513.0 -> 469.0	-	N.D.		
PFDoDA	-	613.0 -> 569.0	-	N.D.		
PFDS	-	599.0 -> 80.0	-	N.D.		
PFHpA	-	363.0 -> 319.0	-	N.D.		
PFHpS	-	449.0 -> 80.0	-	N.D.		
PFHxA	-	313.0 -> 269.0	-	N.D.		
PFHxS	5.944	399.0 -> 80.0	0	0.00	µg/L m	1
PFNA	-	463.0 -> 419.0	-	N.D.		
PFNS	-	549.0 -> 80.0	-	N.D.		
PFOA	6.618	413.0 -> 369.0	132077	15.98	µg/L m	97
PFOS	7.192	499.0 -> 80.0	63473	18.13	µg/L m	78
PFPeA	-	263.0 -> 219.0	-	N.D.		
PFPeS	-	349.0 -> 80.0	-	N.D.		
PFTeDA	-	713.0 -> 669.0	-	N.D.		
PFTrDA	-	663.0 -> 619.0	-	N.D.		
PFUnDA	-	563.0 -> 519.0	-	N.D.		
ADONA	-	377.0 -> 251.0	-	N.D.		
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.		
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.		
HFPO-DA	-	329.0 -> 169.0	-	N.D.		

7.6.11
7

Perfluorinated Compounds by LC/MS/MS

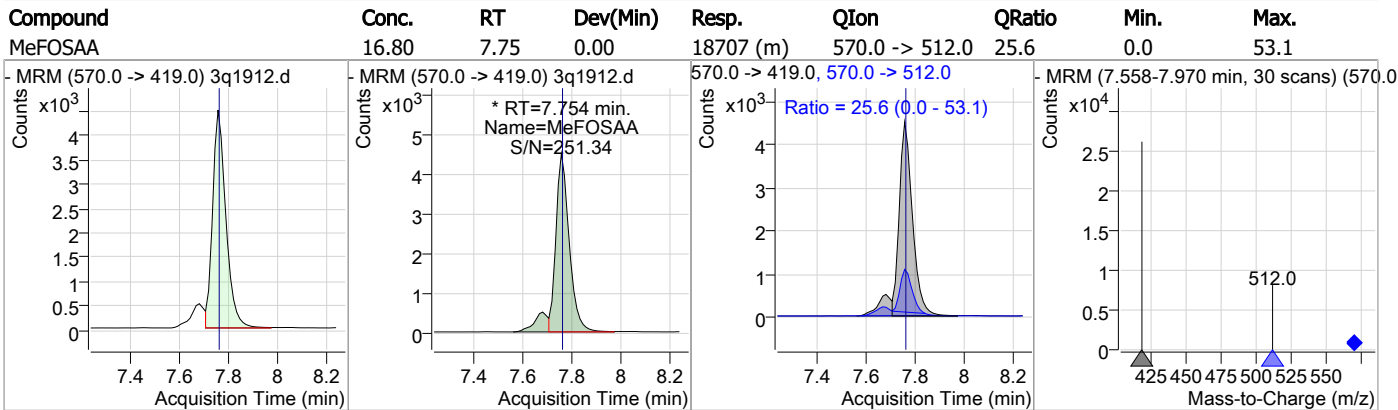
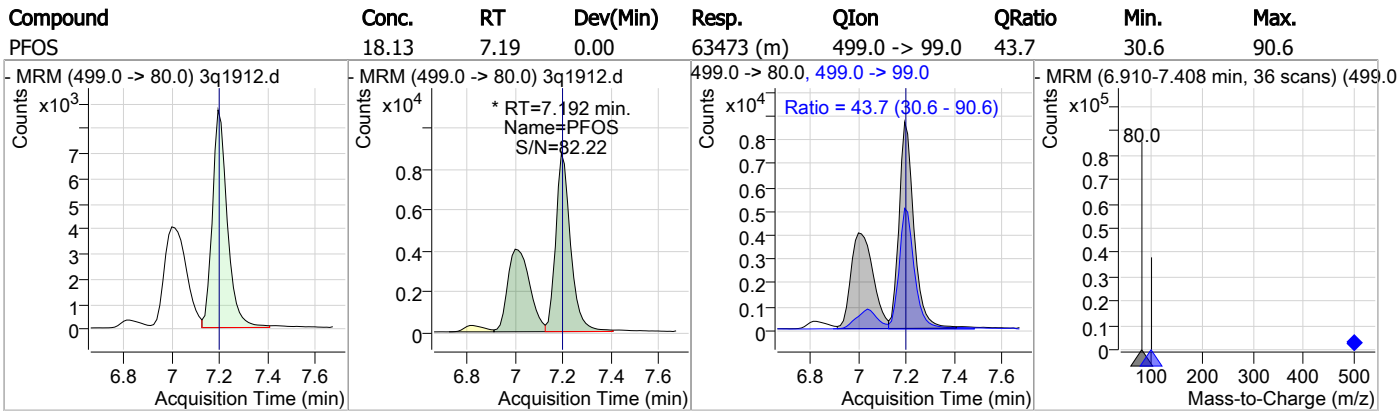
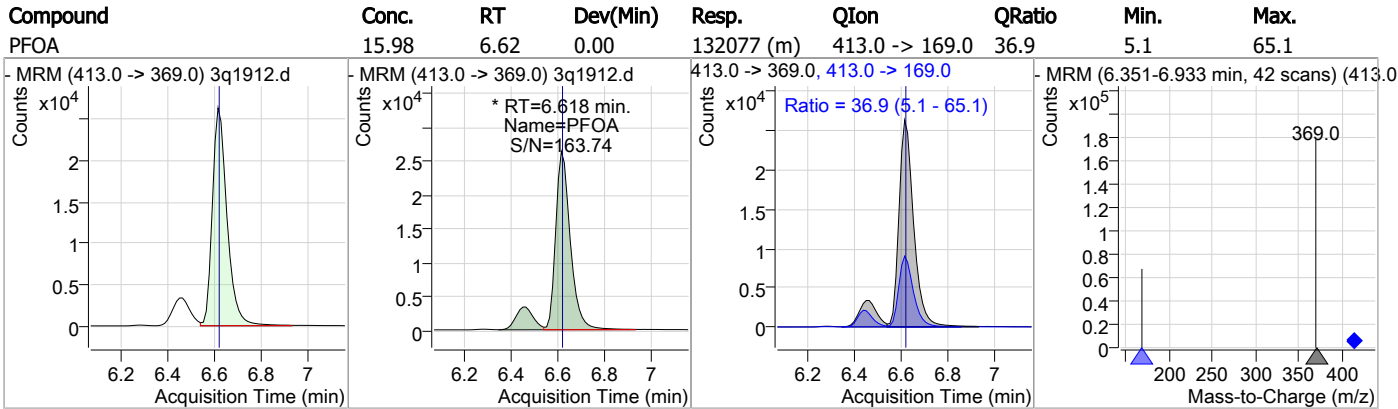
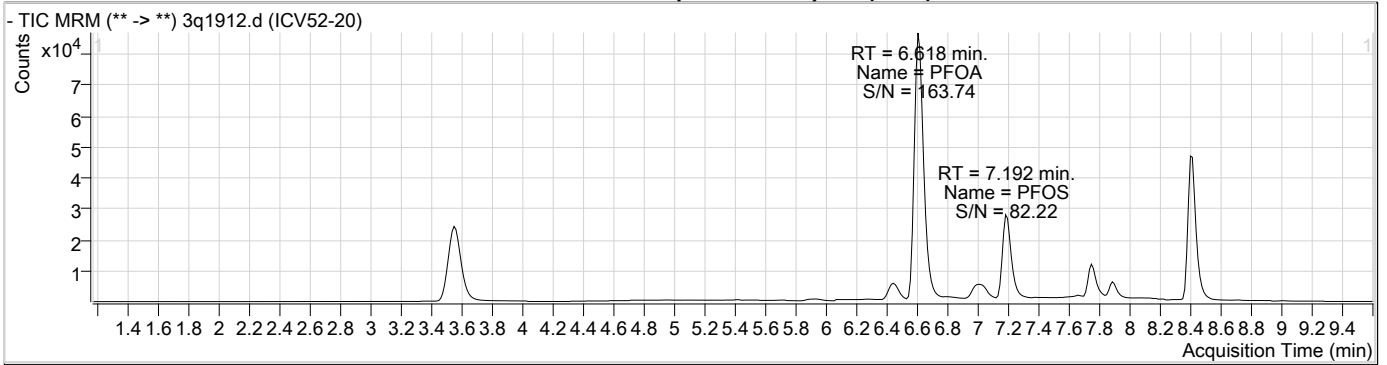
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.11

7

Perfluorinated Compounds by LC/MS/MS

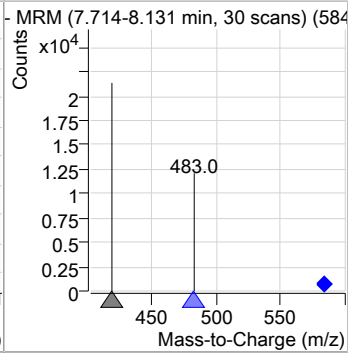
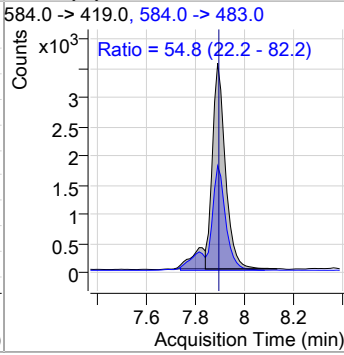
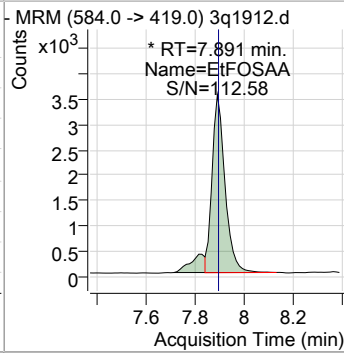
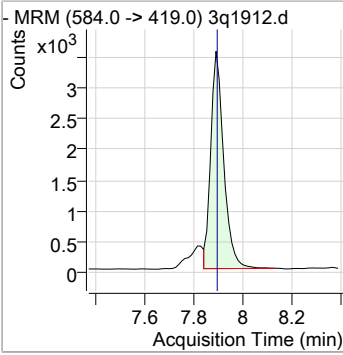


7.6.11
7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	15.78	7.89	0.00	14336 (m)	584.0 -> 483.0	54.8	22.2	82.2



7.6.11

7

Manual Integration Approval Summary

Sample Number: S3Q52-ICV52 **Method:** EPA 537 MOD
Lab FileID: 3Q1912.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 15:07 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		6.62	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak
MeFOSAA	2355-31-9		7.75	Split peak
EtFOSAA	2991-50-6		7.89	Split peak

7.6.11.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1919.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 4:54:32 PM
 Sample Name : CC52-20
 Vial : P1-A7
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.612	429.0 -> 409.0	39095	20.00 µg/L	0.013
13C2-PFDoDA	8.419	615.0 -> 570.0	170603	20.00 µg/L	0.013
13C2-PFOA	6.629	415.0 -> 370.0	178559	20.00 µg/L	0.013
13C3-PFPeA	3.572	266.0 -> 222.0	138449	20.00 µg/L	0.013
13C4-PFOS	7.204	503.0 -> 80.0	55229	20.00 µg/L	0.013
d3-MeFOSAA	7.754	573.0 -> 419.0	19748	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.696	515.0 -> 470.0	190593	20.02 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.1%	
13C2-PFHxA	4.974	315.0 -> 270.0	190334	19.32 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 96.6%	
d5-EtFOSAA	7.890	589.0 -> 419.0	22682	19.88 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 99.4%	
13C3-HFPO-DA	5.278	287.0 -> 169.0	68929	95.49 µg/L	0.025
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 95.5%	
Target Compounds					
4:2FTS	4.871	327.0 -> 307.0	47740	19.45 µg/L	QValue 99
6:2FTS	6.613	427.0 -> 407.0	40100	19.58 µg/L	99
8:2FTS	7.720	527.0 -> 507.0	26031	20.15 µg/L	95
EtFOSAA	7.891	584.0 -> 419.0	18731	20.35 µg/L	97
FOSA	7.321	498.0 -> 78.0	89026	18.91 µg/L	100
MeFOSAA	7.767	570.0 -> 419.0	21839	19.36 µg/L	99
PFBA	1.701	213.0 -> 169.0	58400	18.15 µg/L	100
PFBS	3.891	299.0 -> 80.0	62814	18.82 µg/L	98
PFDA	7.697	513.0 -> 469.0	143442	21.26 µg/L	99
PFDoDA	8.420	613.0 -> 569.0	162065	19.81 µg/L	100
PFDS	8.054	599.0 -> 80.0	9853	20.81 µg/L	96
PFHpA	5.914	363.0 -> 319.0	251428	18.74 µg/L	99
PFHpS	6.634	449.0 -> 80.0	43261	19.68 µg/L	98
PFHxA	4.975	313.0 -> 269.0	90146	18.66 µg/L	98
PFHxS	5.957	399.0 -> 80.0	48585	19.52 µg/L	m 98
PFNA	7.221	463.0 -> 419.0	163264	19.29 µg/L	98
PFNS	7.667	549.0 -> 80.0	38425	20.71 µg/L	100
PFOA	6.630	413.0 -> 369.0	154501	19.57 µg/L	98
PFOS	7.205	499.0 -> 80.0	64446	19.21 µg/L	m 83
PFPeA	3.575	263.0 -> 219.0	189077	19.44 µg/L	100
PFPeS	5.105	349.0 -> 80.0	38246	19.64 µg/L	99
PFTeDA	9.016	713.0 -> 669.0	208434	19.50 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	178916	19.93 µg/L	99
PFUnDA	8.084	563.0 -> 519.0	151132	20.39 µg/L	98
ADONA	6.012	377.0 -> 251.0	355631	18.53 µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	35496	18.89 µg/L	100
11Cl-PF3OUdS	8.215	631.0 -> 451.0	139469	18.94 µg/L	100
HFPO-DA	5.270	329.0 -> 169.0	223126	96.19 µg/L	98

7.6.12
7



Perfluorinated Compounds by LC/MS/MS

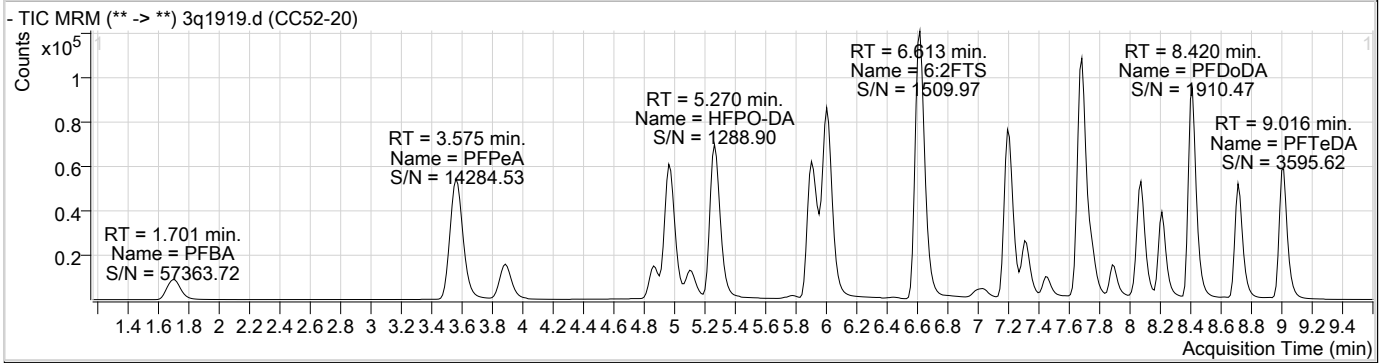
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

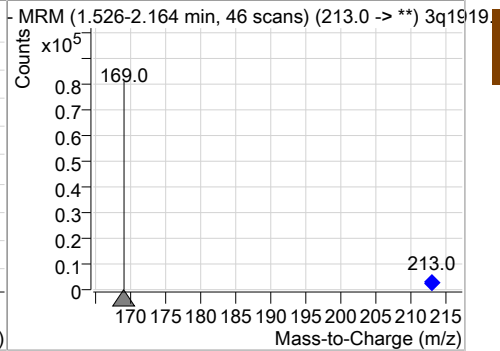
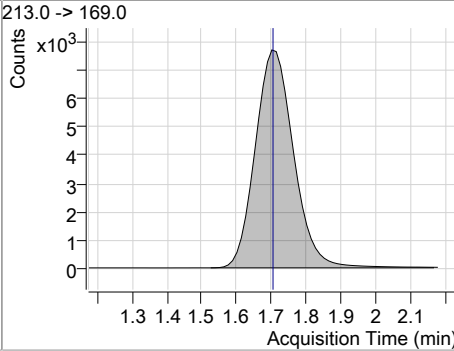
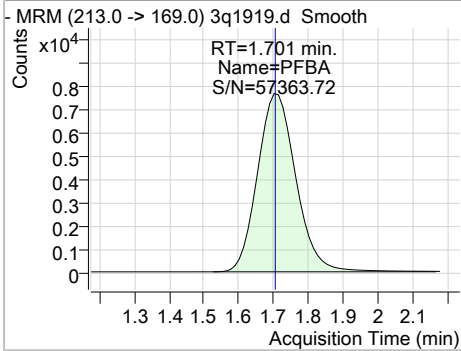
7.6.12

7

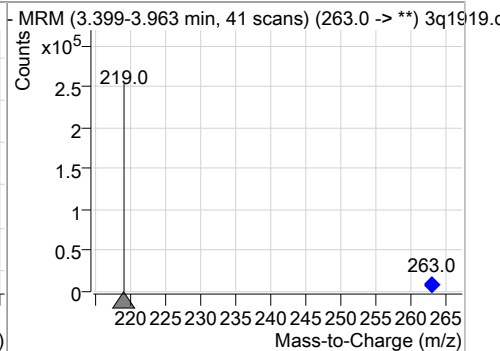
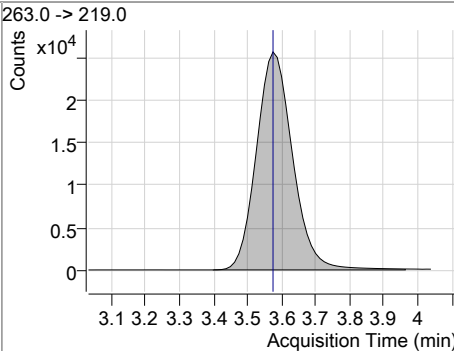
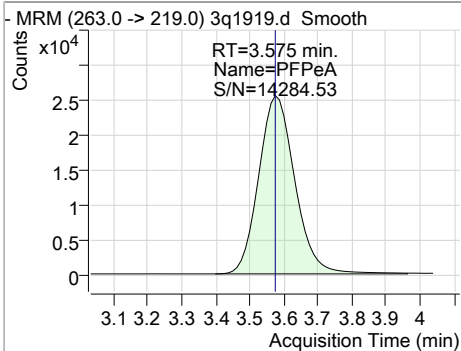
Perfluorinated Compounds by LC/MS/MS



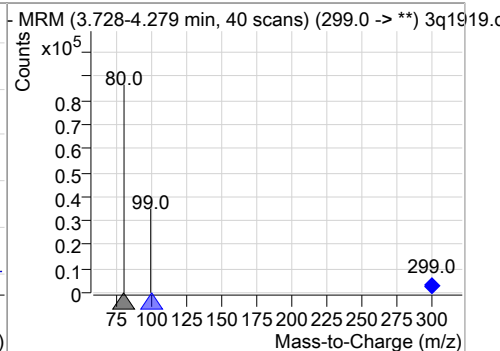
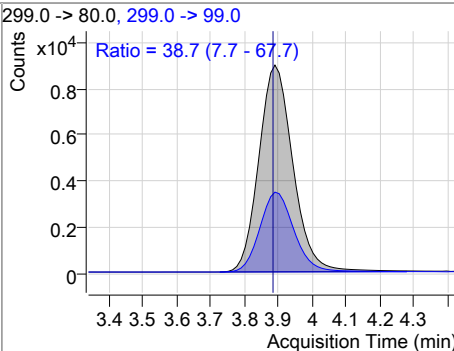
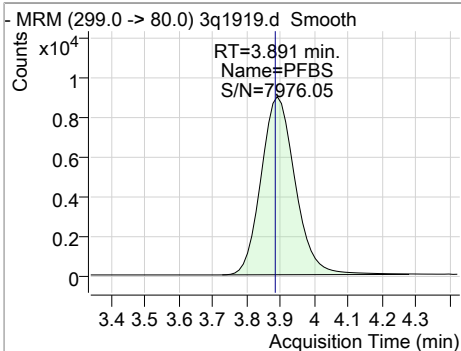
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	18.15	1.70	0.00	58400				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	19.44	3.57	0.01	189077				



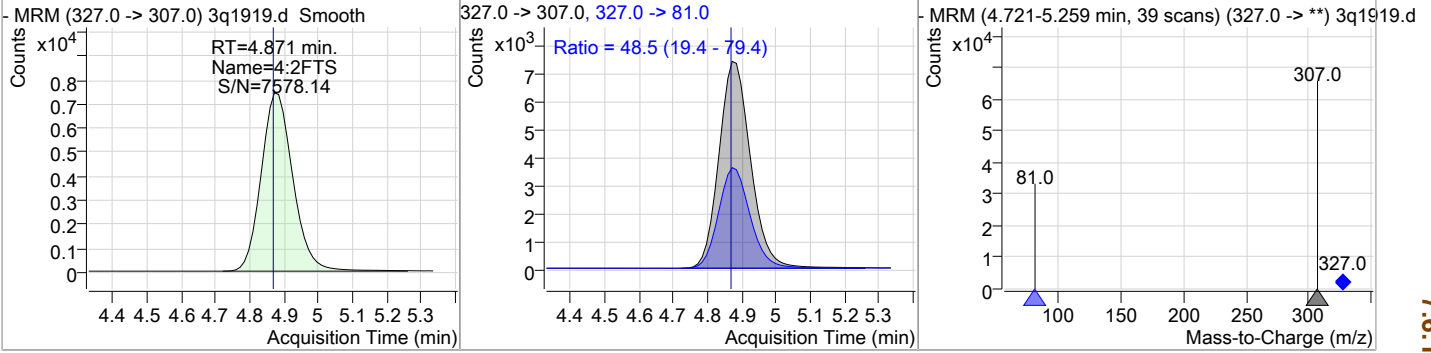
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	18.82	3.89	0.01	62814	299.0 -> 99.0	38.7	7.7	67.7



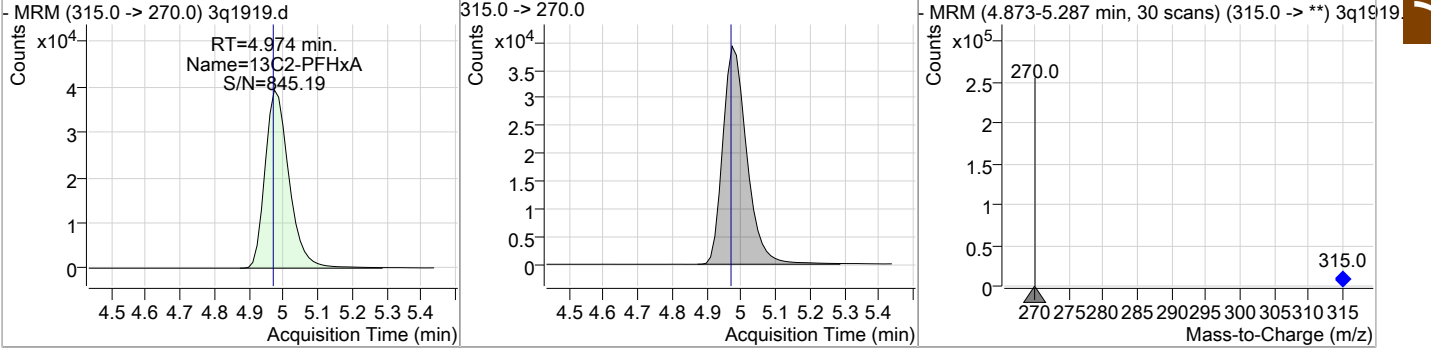
7.6.12
7

Perfluorinated Compounds by LC/MS/MS

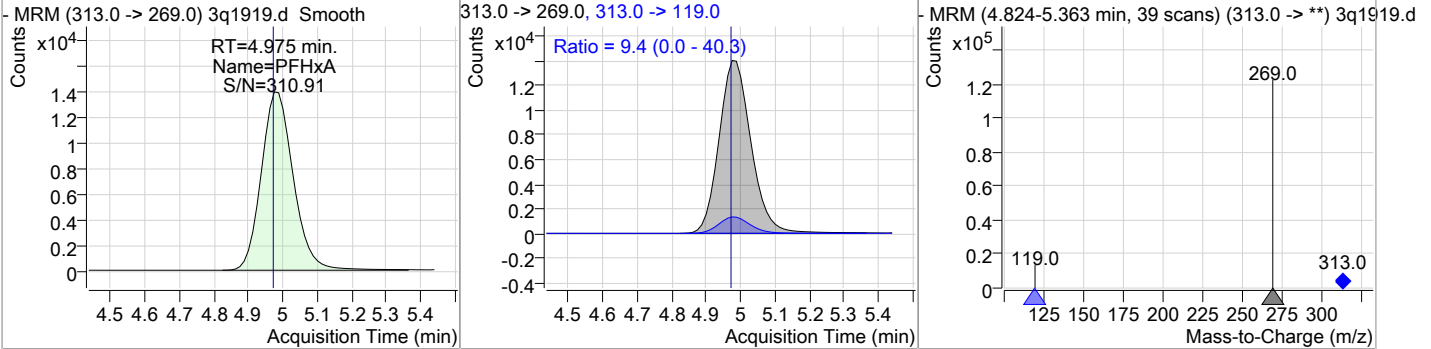
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	19.45	4.87	0.01	47740	327.0 -> 81.0	48.5	19.4	79.4



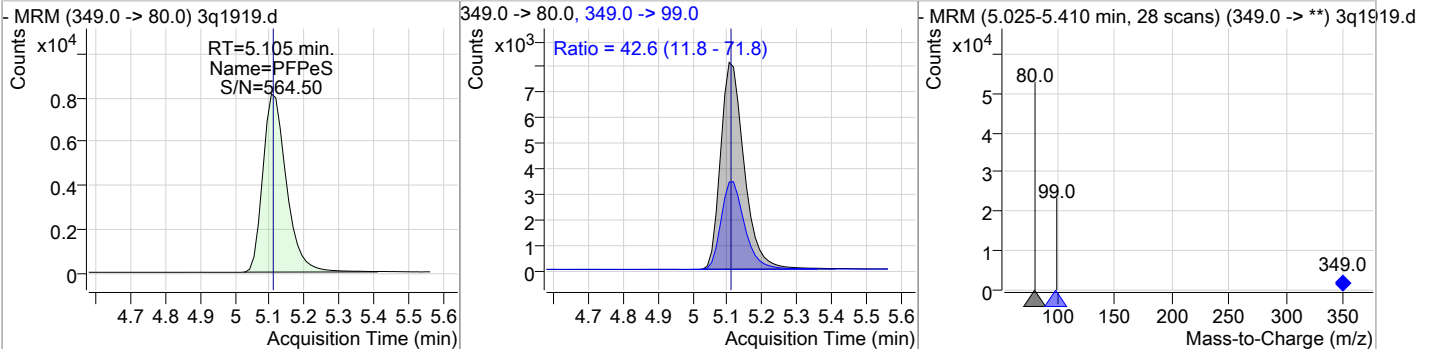
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.32	4.97	0.01	190334				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.66	4.97	0.01	90146	313.0 -> 119.0	9.4	0.0	40.3

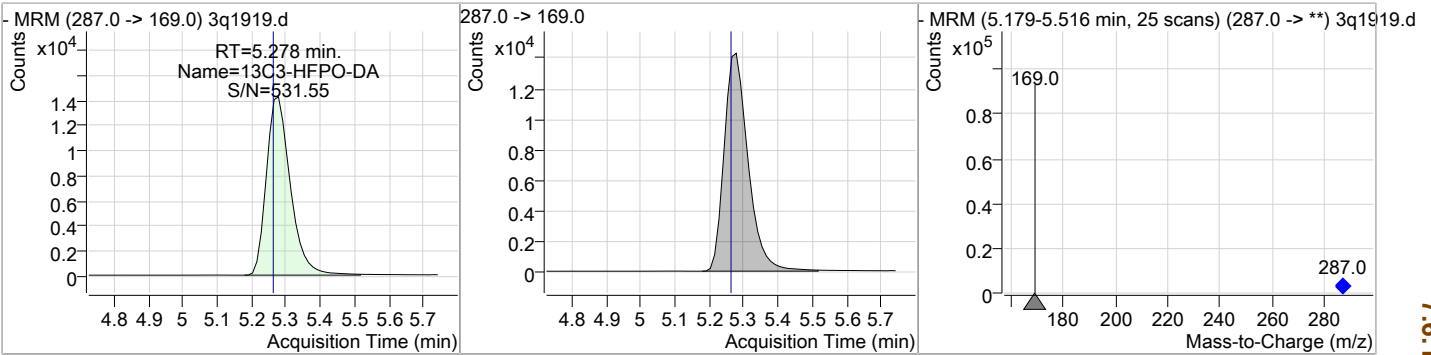


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.64	5.11	0.01	38246	349.0 -> 99.0	42.6	11.8	71.8

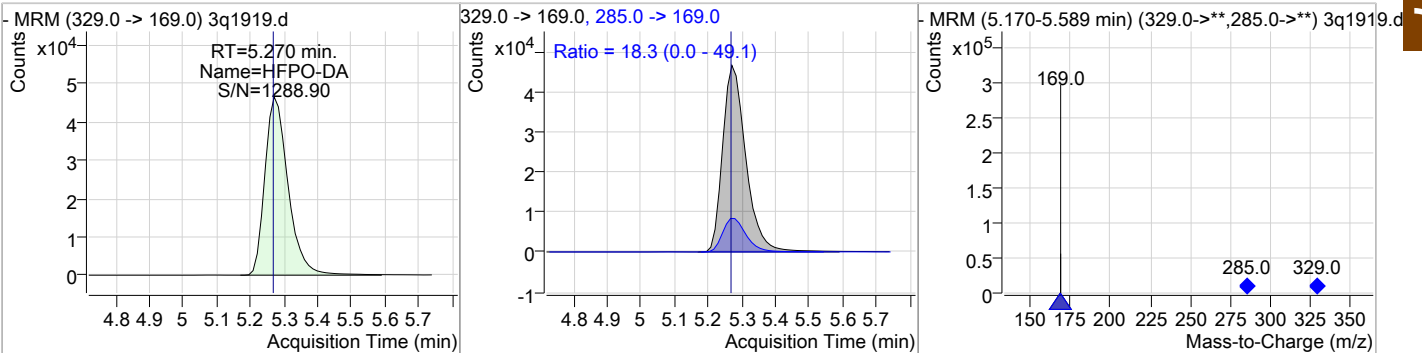


Perfluorinated Compounds by LC/MS/MS

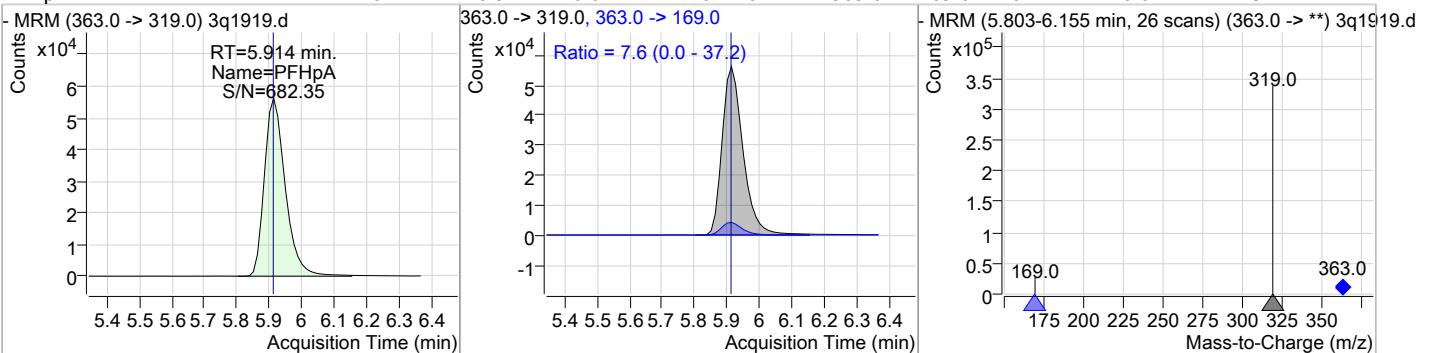
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



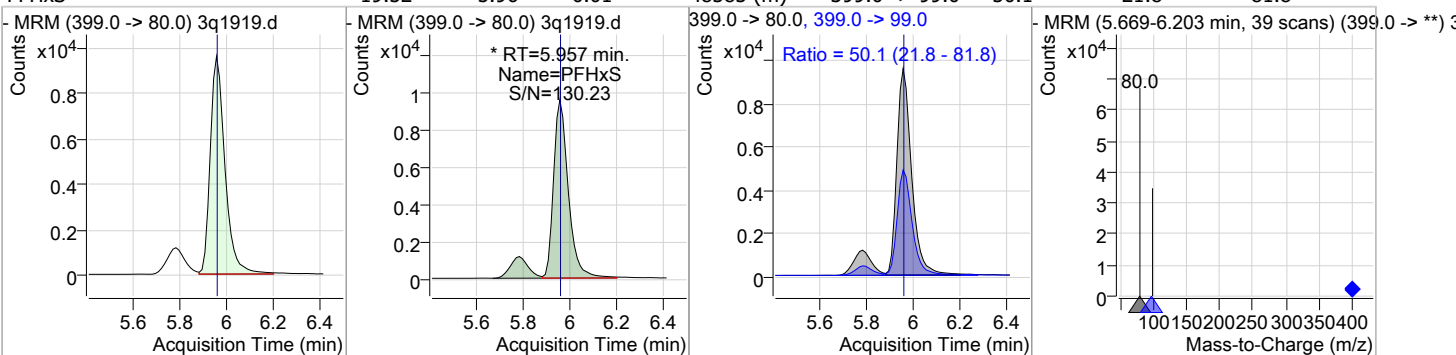
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

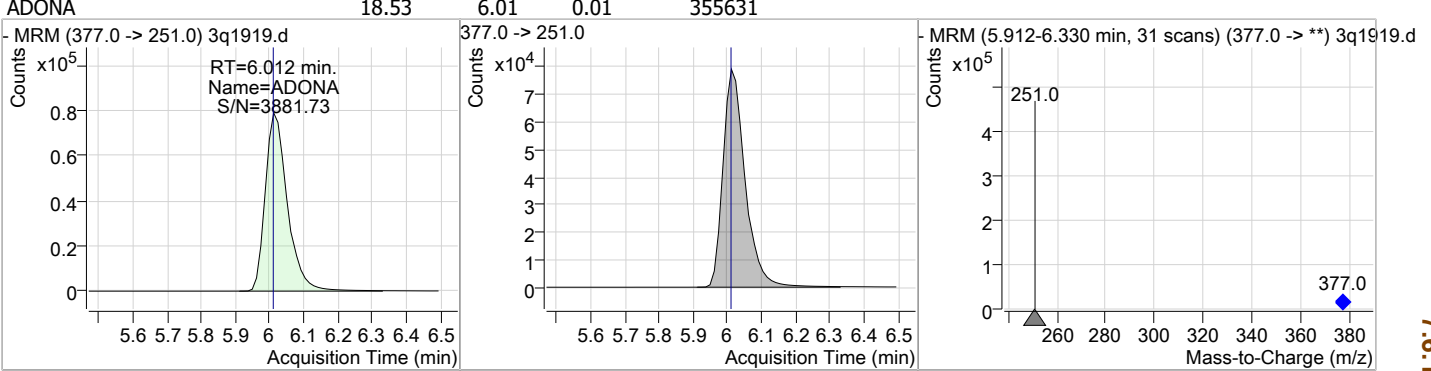


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

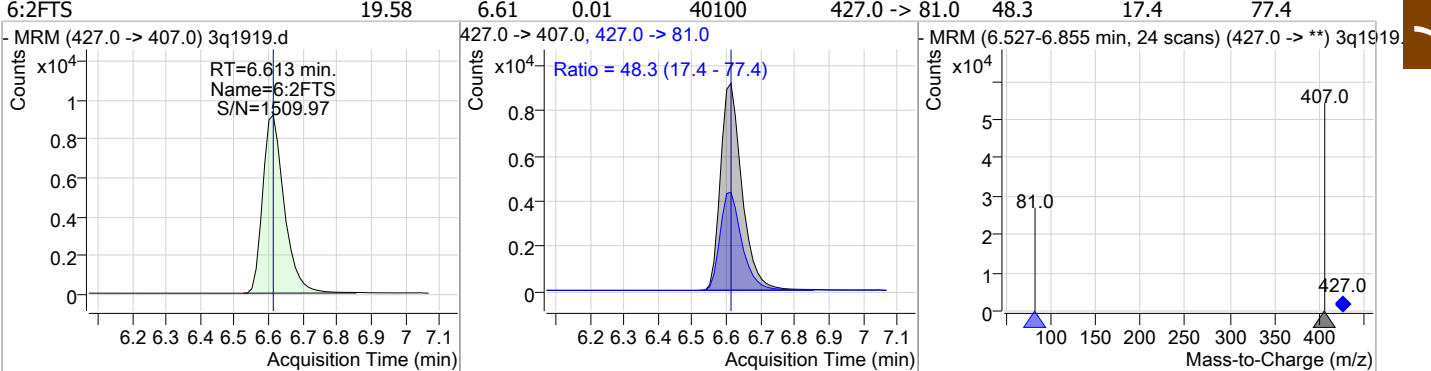


Perfluorinated Compounds by LC/MS/MS

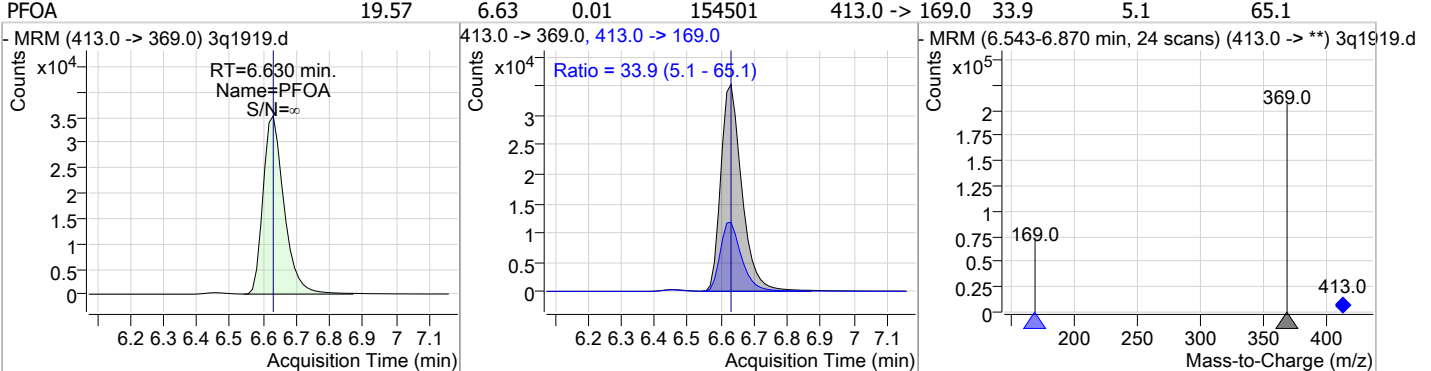
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



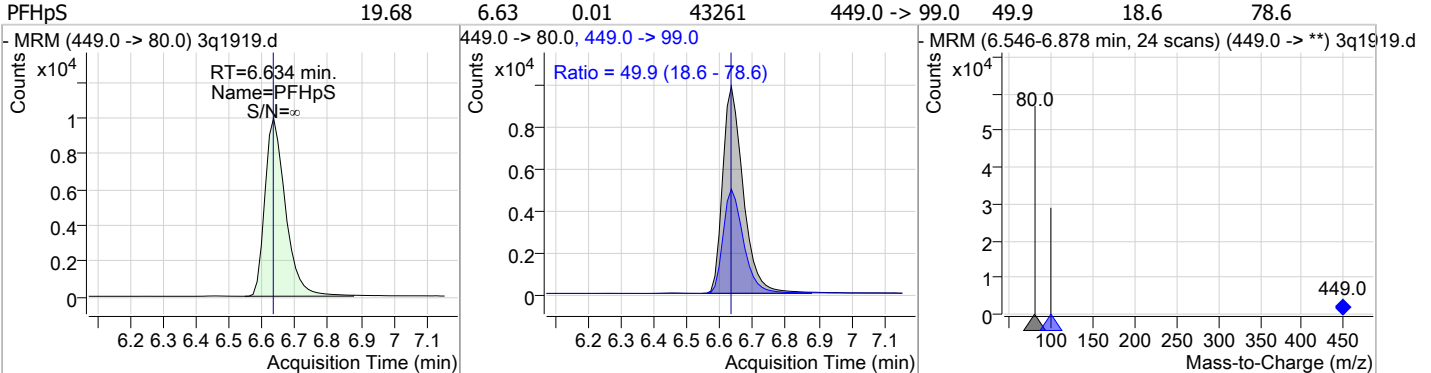
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



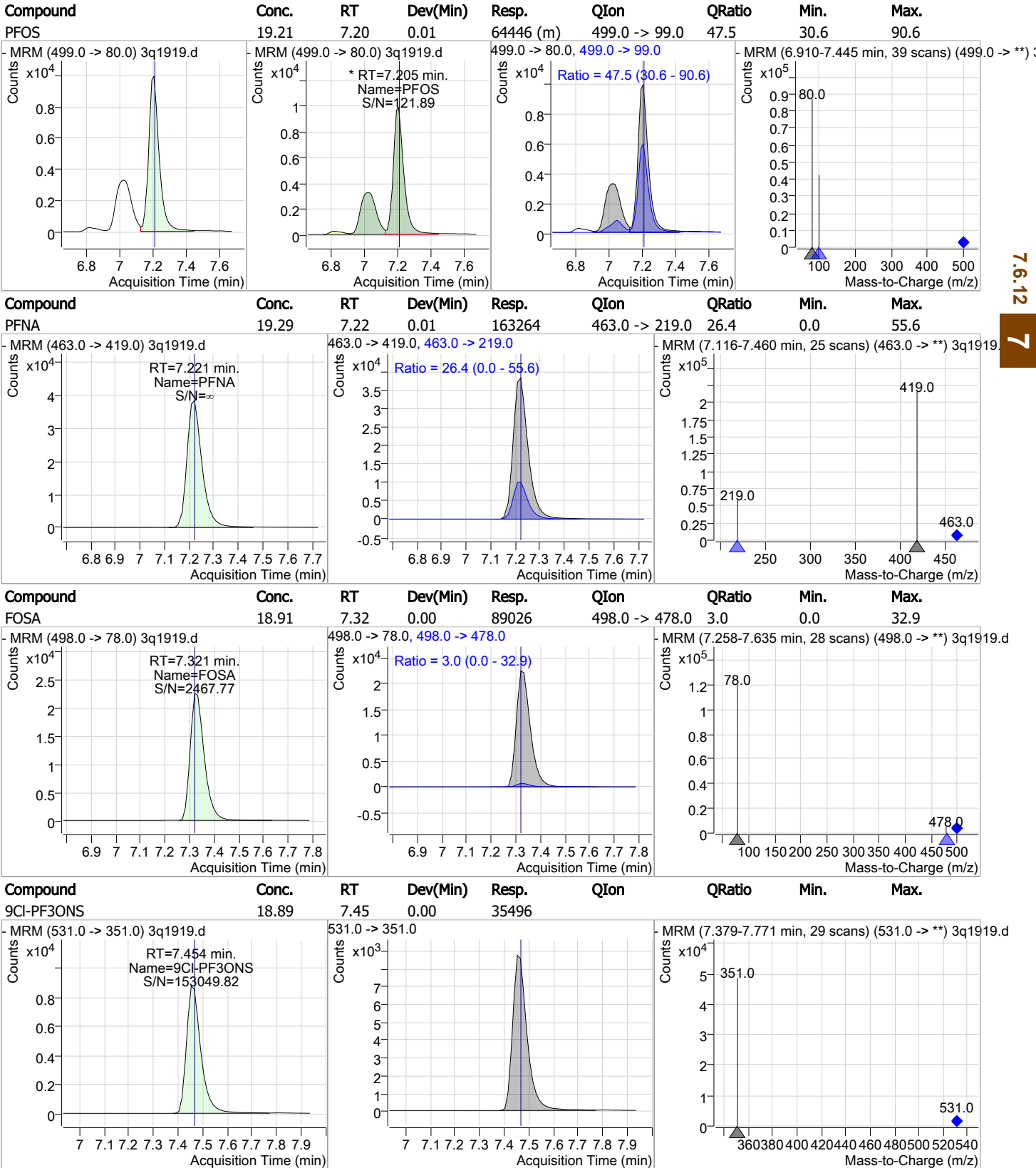
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Perfluorinated Compounds by LC/MS/MS

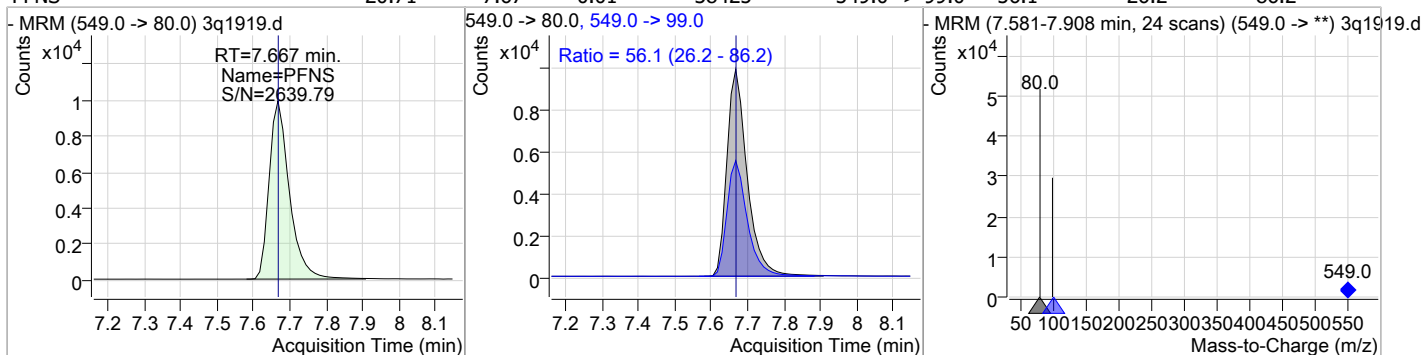


7.6.12 7

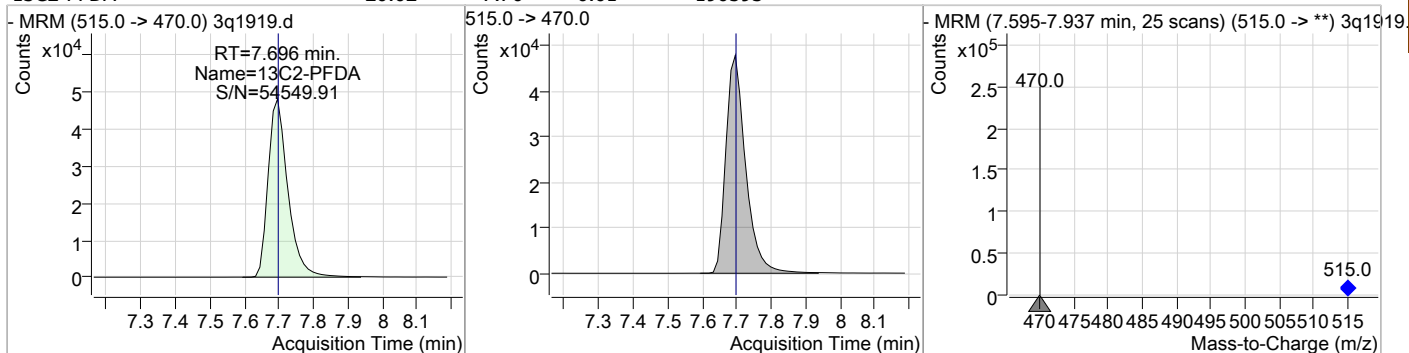


Perfluorinated Compounds by LC/MS/MS

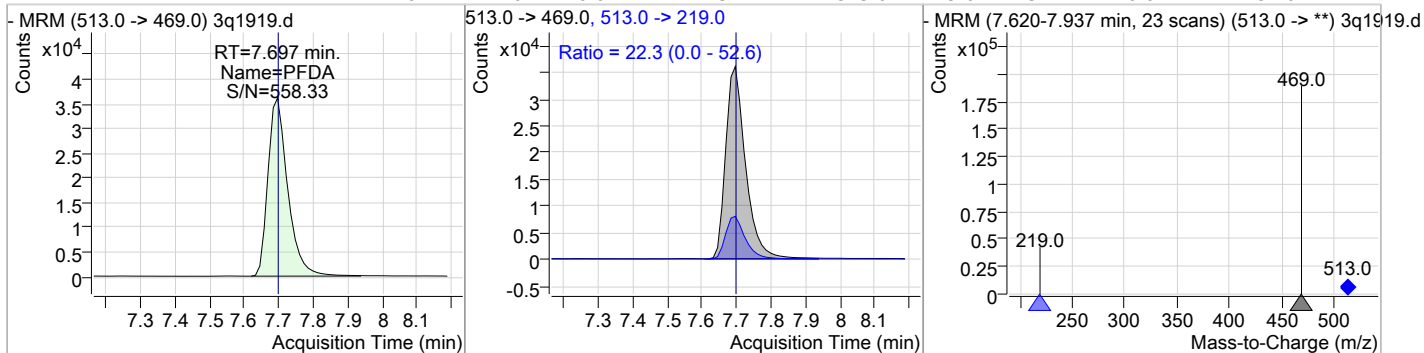
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	20.71	7.67	0.01	38425	549.0 -> 99.0	56.1	26.2	86.2



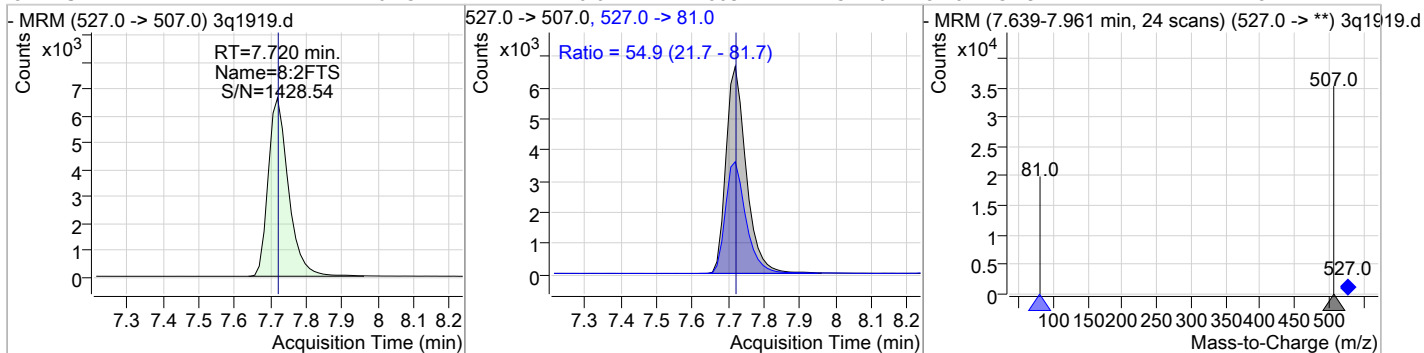
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.02	7.70	0.01	190593				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	21.26	7.70	0.01	143442	513.0 -> 219.0	22.3	0.0	52.6

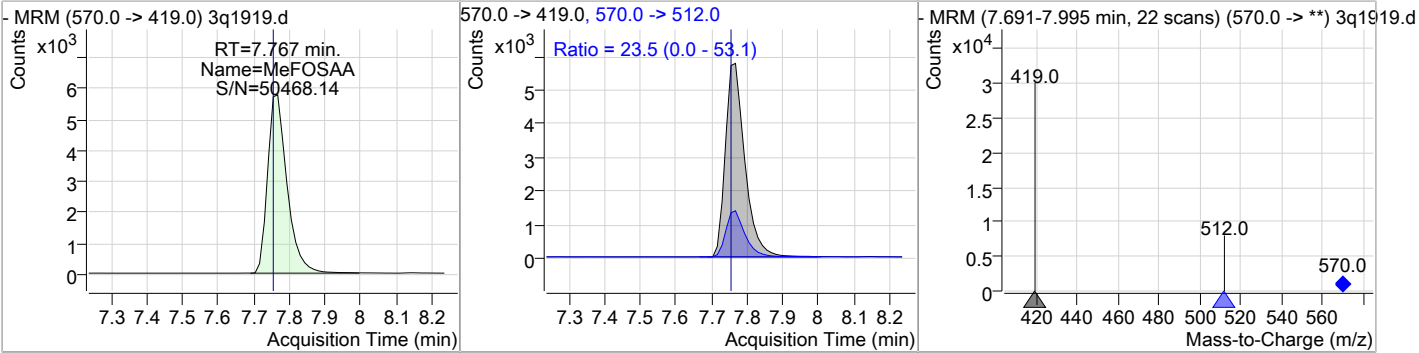


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	20.15	7.72	0.01	26031	527.0 -> 81.0	54.9	21.7	81.7

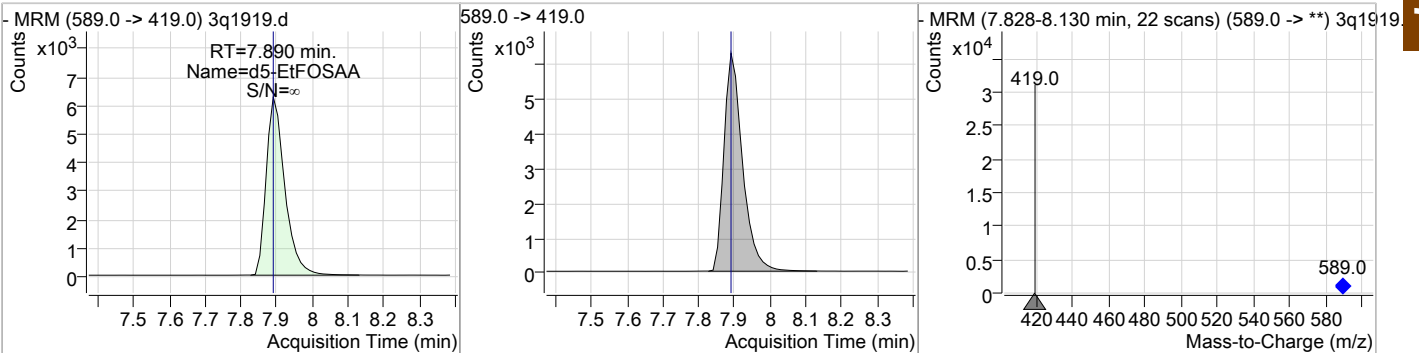


Perfluorinated Compounds by LC/MS/MS

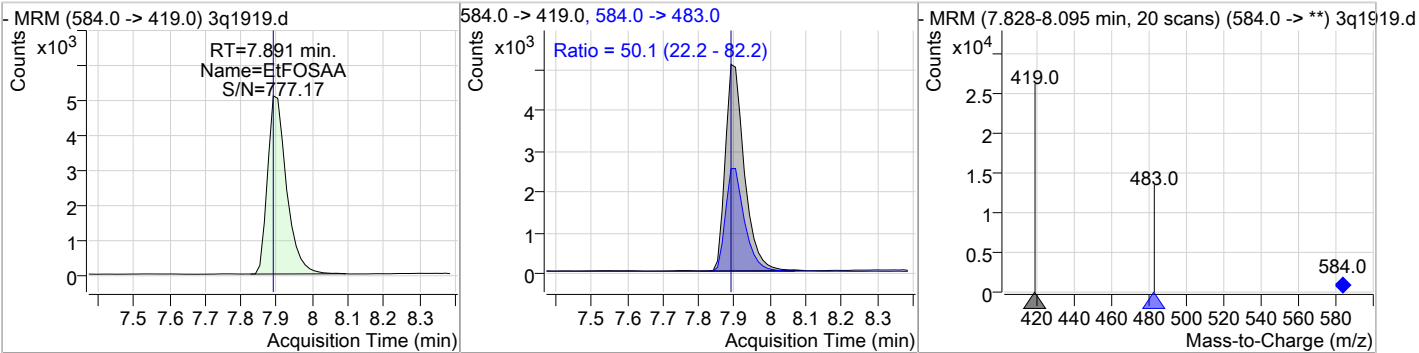
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	19.36	7.77	0.01	21839	570.0 -> 512.0	23.5	0.0	53.1



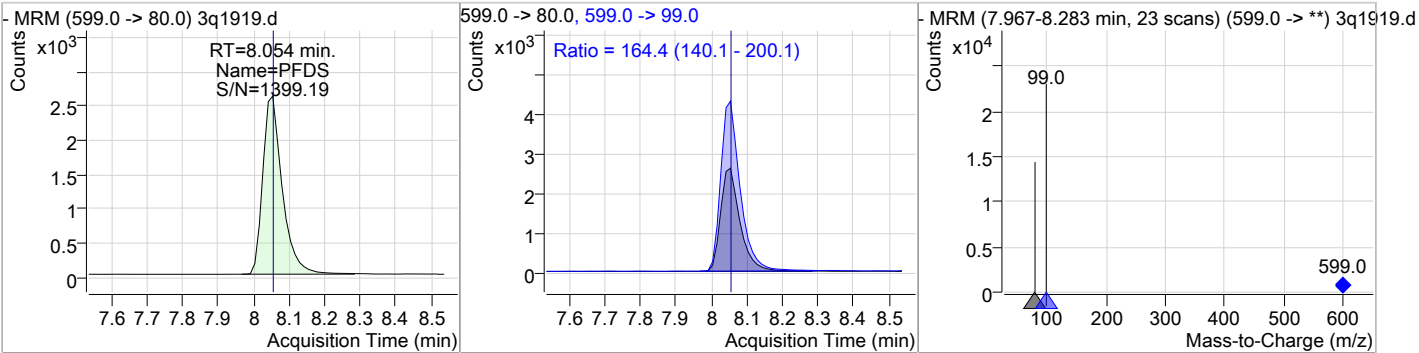
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	19.88	7.89	0.00	22682				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	20.35	7.89	0.00	18731	584.0 -> 483.0	50.1	22.2	82.2



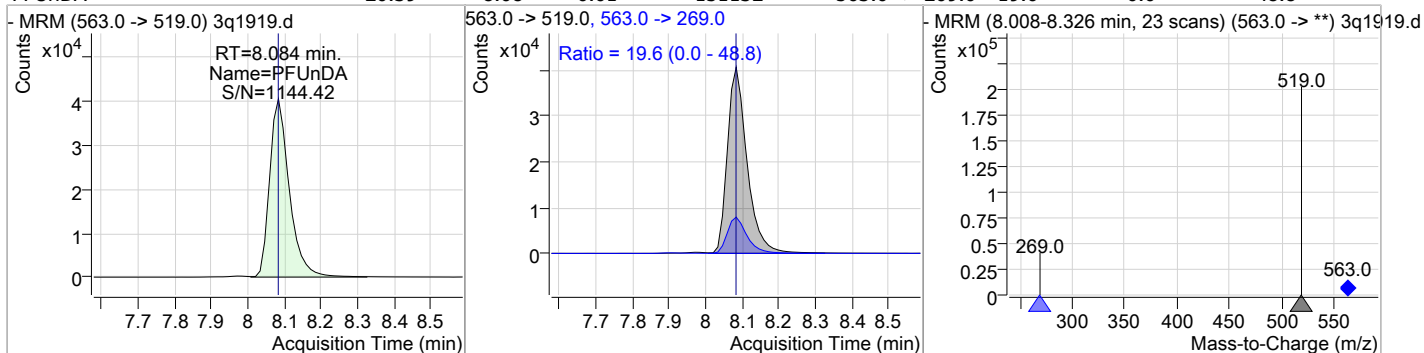
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	20.81	8.05	0.01	9853	599.0 -> 99.0	164.4	140.1	200.1



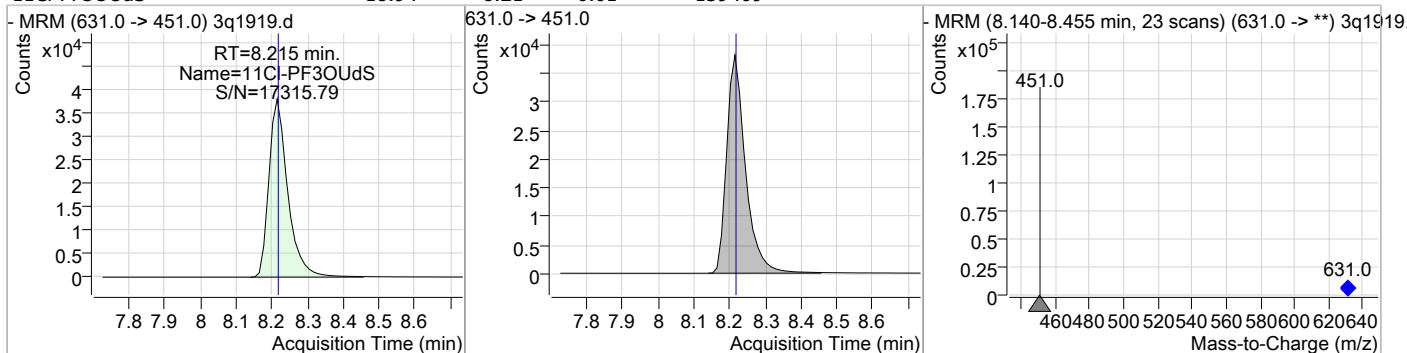
7.6.12
7

Perfluorinated Compounds by LC/MS/MS

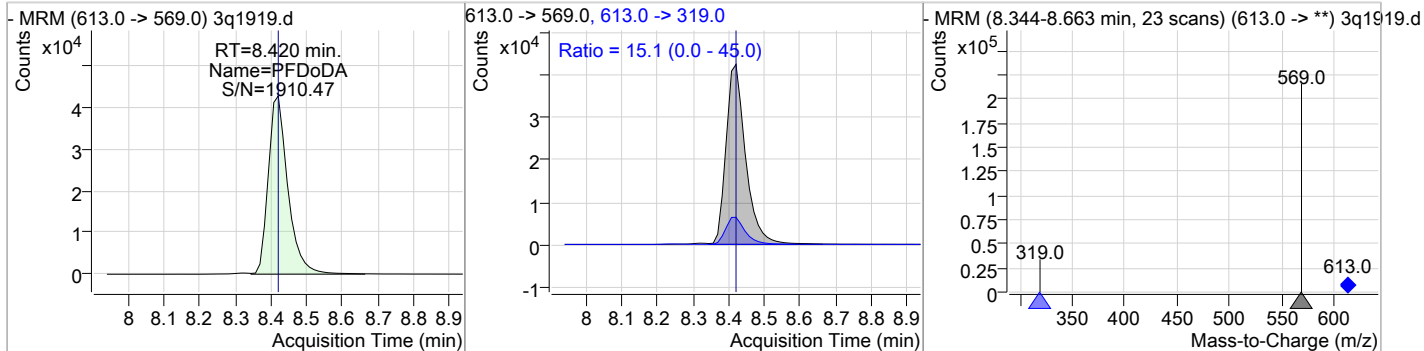
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	20.39	8.08	0.01	151132	563.0 -> 269.0	19.6	0.0	48.8



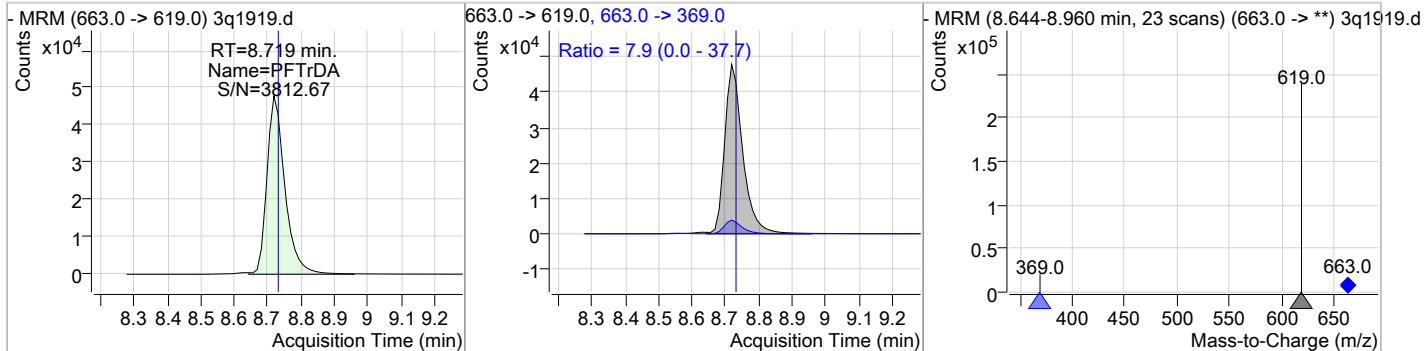
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	18.94	8.21	0.01	139469	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.81	8.42	0.01	162065	613.0 -> 319.0	15.1	0.0	45.0

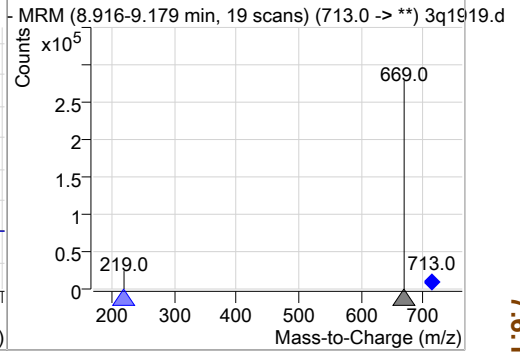
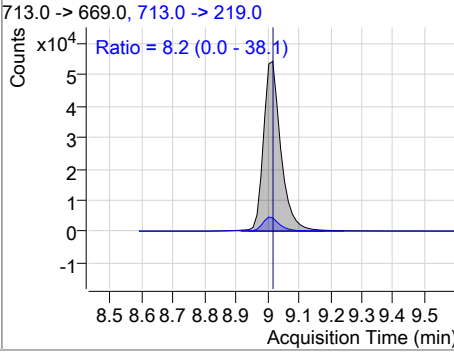
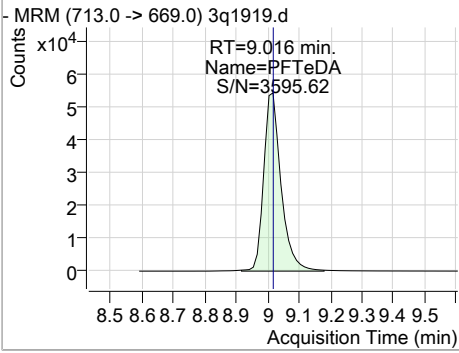


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	19.93	8.72	0.00	178916	663.0 -> 369.0	7.9	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	19.50	9.02	0.01	208434	713.0 -> 219.0	8.2	0.0	38.1



7.6.12
7

Manual Integration Approval Summary

Sample Number: S3Q52-CC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1919.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 16:54 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.96	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.21	Split peak

7.6.12.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1926.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/15/2019 6:41:51 PM
 Sample Name : CC52-20
 Vial : P1-A7
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : S3Q52.batch.bin
 Sample Information : op74124,S3Q52,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.612	429.0 -> 409.0	38796	20.00 µg/L	0.013
13C2-PFDoDA	8.419	615.0 -> 570.0	169877	20.00 µg/L	0.013
13C2-PFOA	6.629	415.0 -> 370.0	176343	20.00 µg/L	0.013
13C3-PFPeA	3.584	266.0 -> 222.0	138689	20.00 µg/L	0.025
13C4-PFOS	7.204	503.0 -> 80.0	54315	20.00 µg/L	0.013
d3-MeFOSAA	7.754	573.0 -> 419.0	18604	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.696	515.0 -> 470.0	189725	20.18 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.9%	
13C2-PFHxA	4.974	315.0 -> 270.0	188373	19.36 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 96.8%	
d5-EtFOSAA	7.890	589.0 -> 419.0	22872	21.28 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 106.4%	
13C3-HFPO-DA	5.278	287.0 -> 169.0	67092	94.09 µg/L	0.025
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 94.1%	
Target Compounds					
4:2FTS	4.883	327.0 -> 307.0	48234	19.80 µg/L	QValue 97
6:2FTS	6.613	427.0 -> 407.0	39910	19.64 µg/L	98
8:2FTS	7.720	527.0 -> 507.0	26031	20.30 µg/L	94
EtFOSAA	7.904	584.0 -> 419.0	18527	21.37 µg/L	98
FOSA	7.333	498.0 -> 78.0	87794	19.81 µg/L	100
MeFOSAA	7.767	570.0 -> 419.0	21678	20.40 µg/L	99
PFBA	1.714	213.0 -> 169.0	57658	18.14 µg/L	100
PFBS	3.891	299.0 -> 80.0	62345	19.00 µg/L	98
PFDA	7.697	513.0 -> 469.0	141061	21.17 µg/L	100
PFDoDA	8.420	613.0 -> 569.0	157527	19.33 µg/L	99
PFDS	8.054	599.0 -> 80.0	9498	20.40 µg/L	99
PFHpA	5.914	363.0 -> 319.0	248017	18.71 µg/L	99
PFHpS	6.634	449.0 -> 80.0	42649	19.73 µg/L	97
PFHxA	4.987	313.0 -> 269.0	88736	18.60 µg/L	98
PFHxS	5.957	399.0 -> 80.0	47957	19.59 µg/L	m 97
PFNA	7.221	463.0 -> 419.0	161176	19.28 µg/L	99
PFNS	7.667	549.0 -> 80.0	38030	20.84 µg/L	98
PFOA	6.630	413.0 -> 369.0	150947	19.36 µg/L	99
PFOS	7.205	499.0 -> 80.0	63340	19.20 µg/L	m 83
PFPeA	3.587	263.0 -> 219.0	187437	19.24 µg/L	100
PFPeS	5.118	349.0 -> 80.0	38298	19.63 µg/L	99
PFTeDA	9.016	713.0 -> 669.0	201787	18.96 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	176722	19.77 µg/L	99
PFUnDA	8.084	563.0 -> 519.0	150585	20.41 µg/L	100
ADONA	6.025	377.0 -> 251.0	349776	18.46 µg/L	100
9Cl-PF3ONS	7.466	531.0 -> 351.0	33964	18.30 µg/L	100
11Cl-PF3OUdS	8.215	631.0 -> 451.0	137535	18.91 µg/L	100
HFPO-DA	5.270	329.0 -> 169.0	219801	95.94 µg/L	99

7.6.13
7

Perfluorinated Compounds by LC/MS/MS

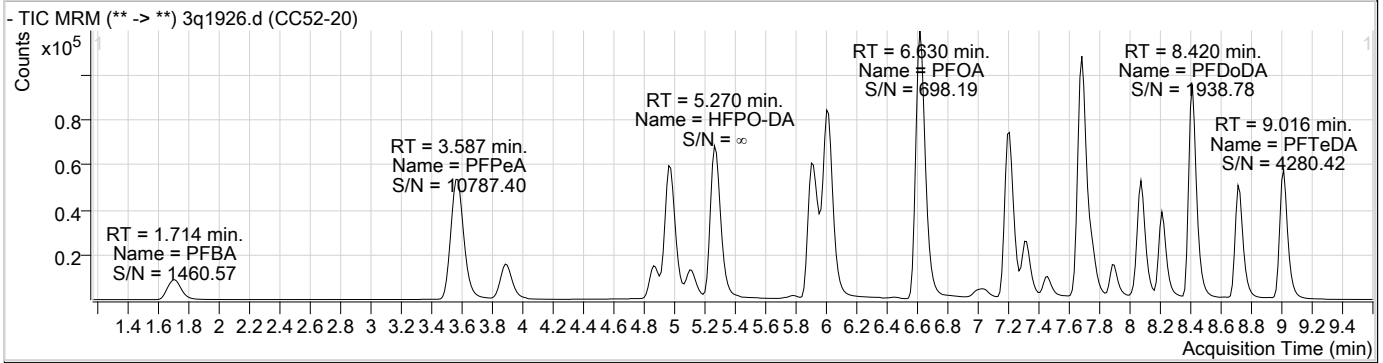
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

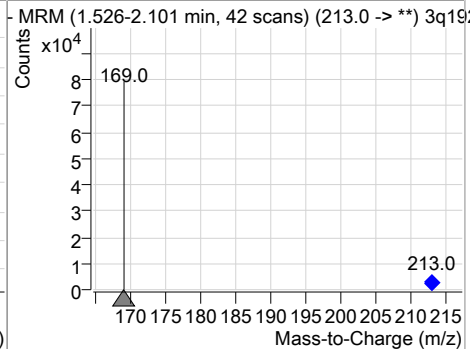
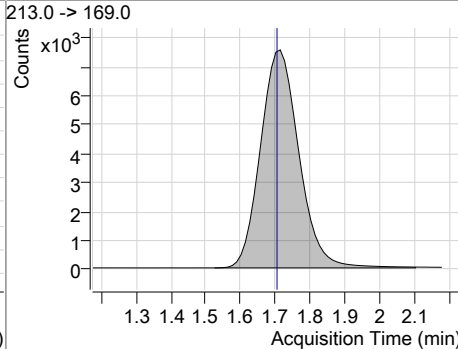
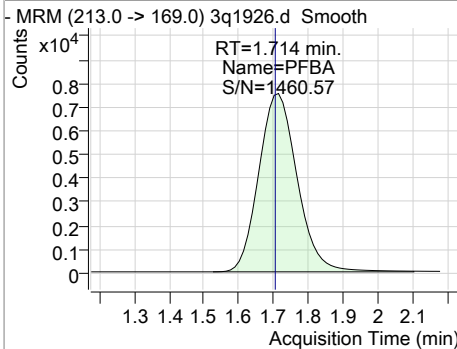
7.6.13

7

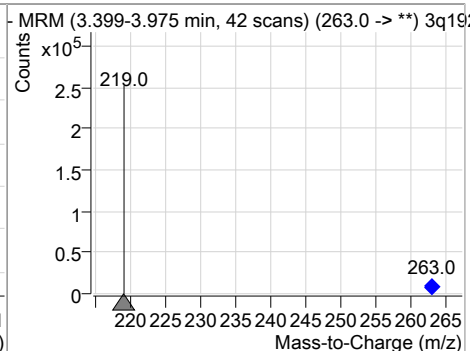
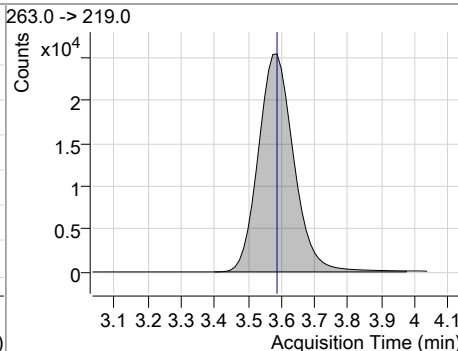
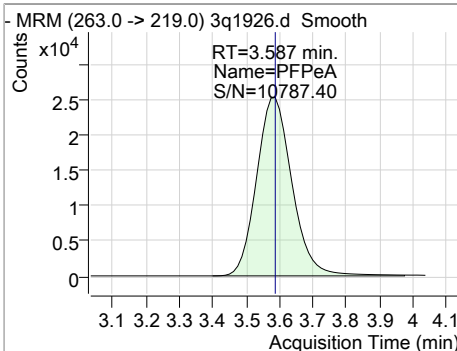
Perfluorinated Compounds by LC/MS/MS



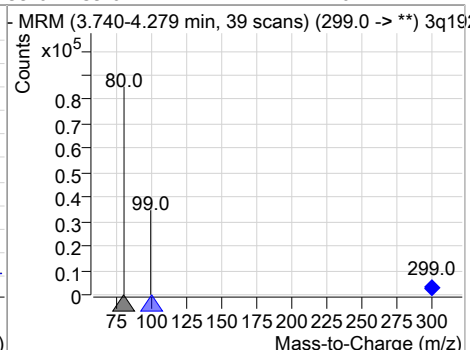
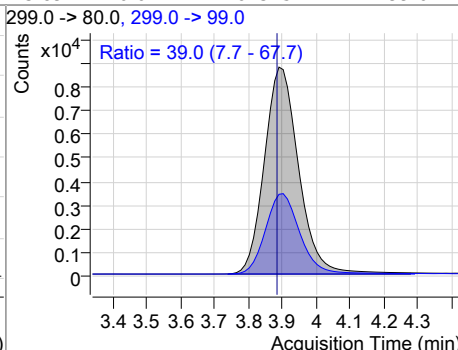
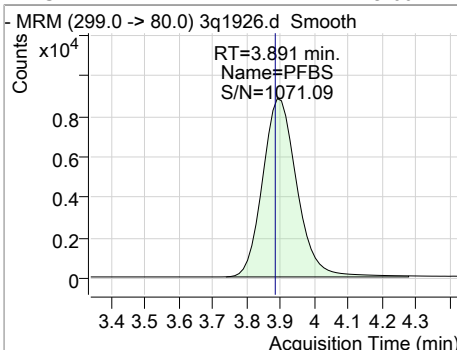
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	18.14	1.71	0.01	57658				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	19.24	3.59	0.03	187437				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	19.00	3.89	0.01	62345	299.0 -> 99.0	39.0	7.7	67.7

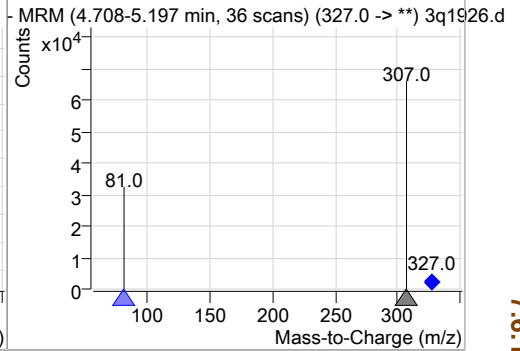
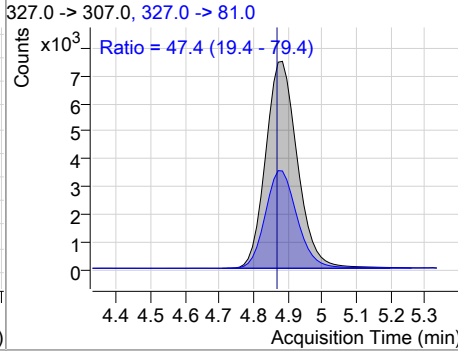
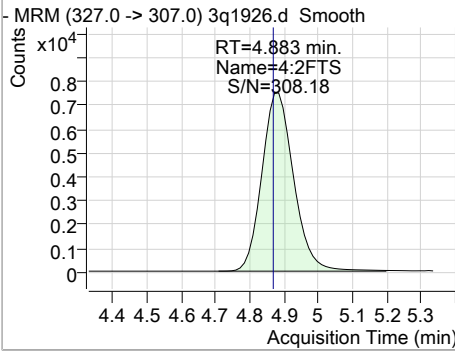


7.6.13

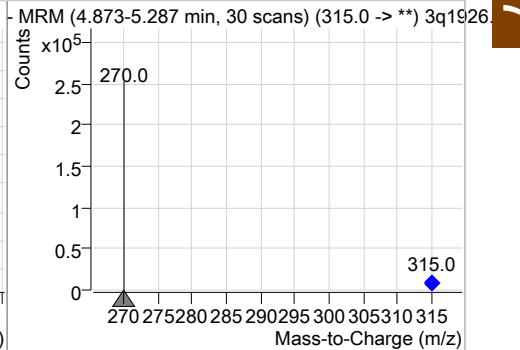
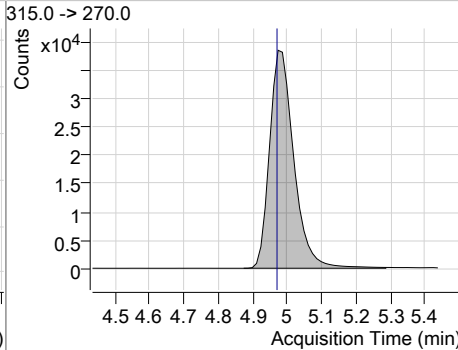
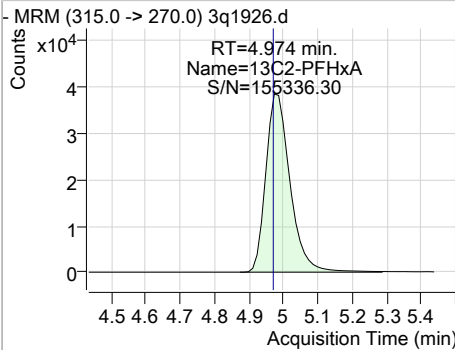
7

Perfluorinated Compounds by LC/MS/MS

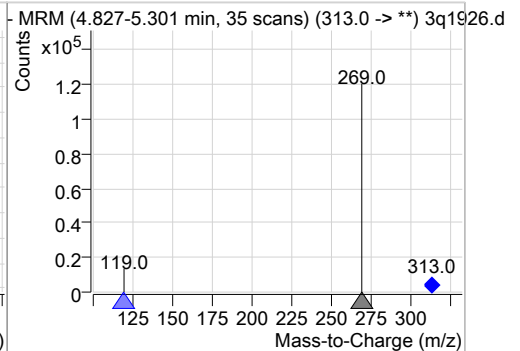
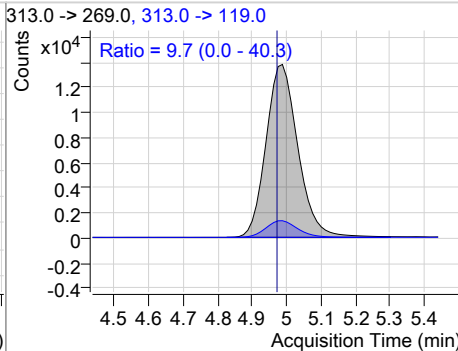
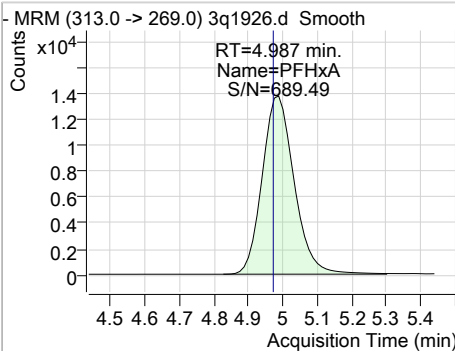
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	19.80	4.88	0.03	48234	327.0 -> 81.0	47.4	19.4	79.4



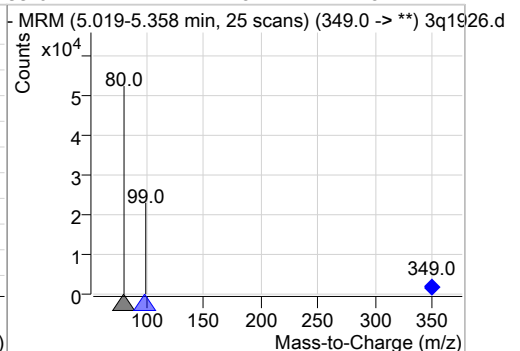
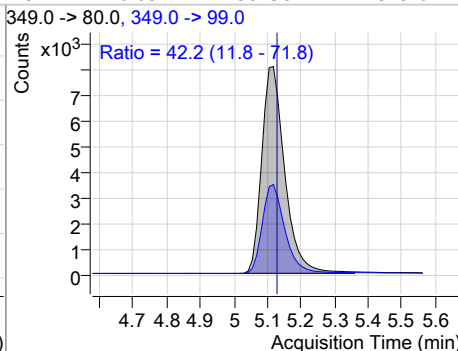
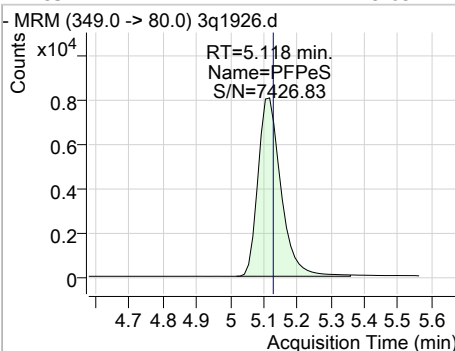
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.36	4.97	0.01	188373				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.60	4.99	0.03	88736	313.0 -> 119.0	9.7	0.0	40.3

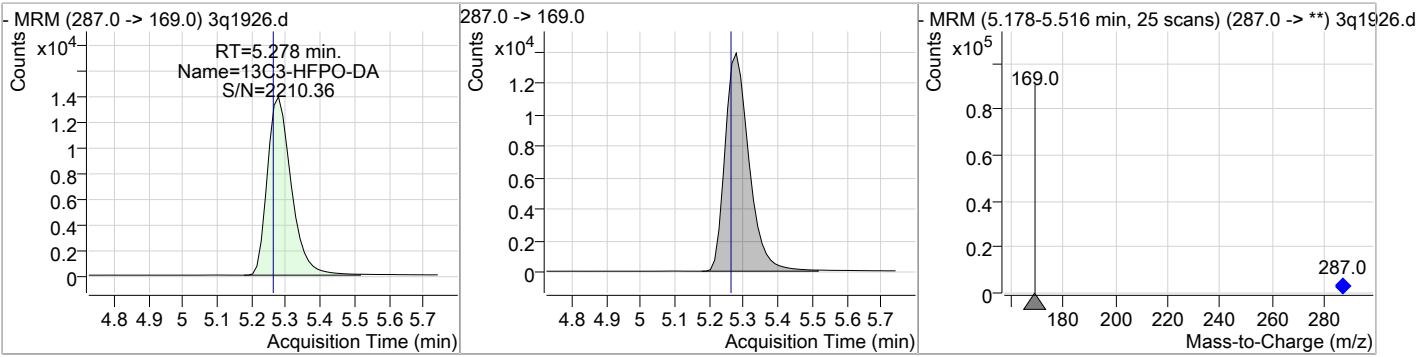


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.63	5.12	0.03	38298	349.0 -> 99.0	42.2	11.8	71.8

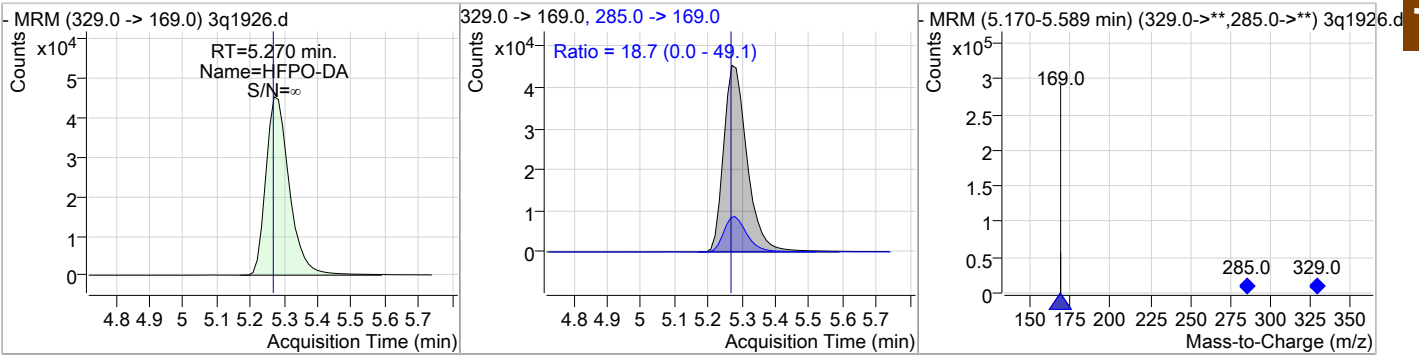


Perfluorinated Compounds by LC/MS/MS

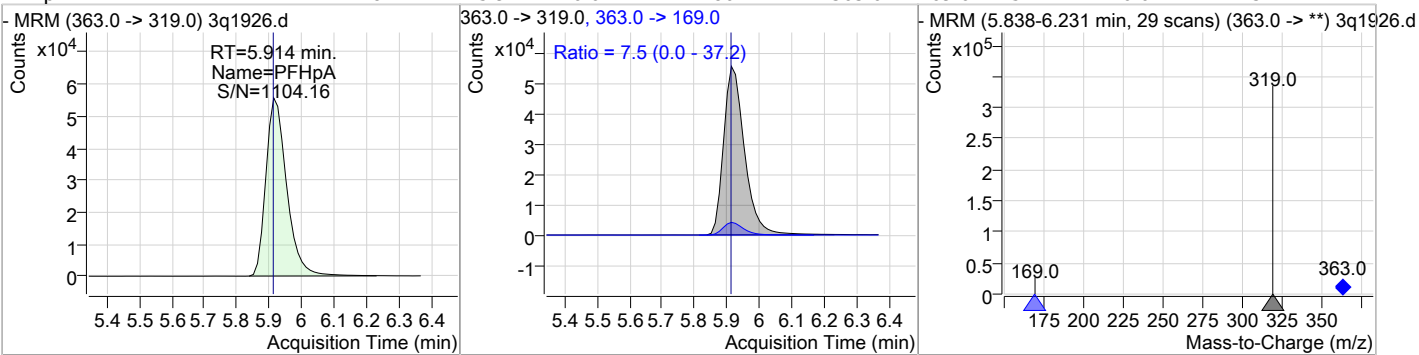
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



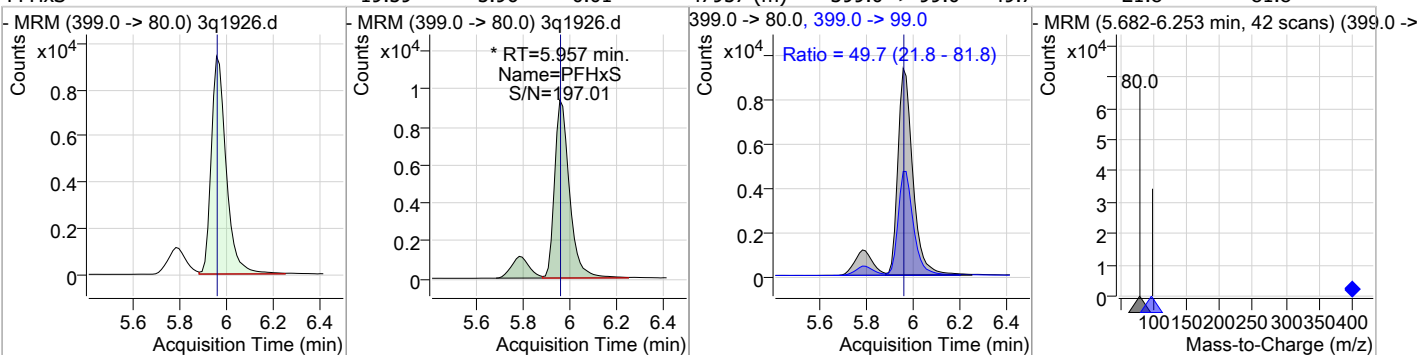
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

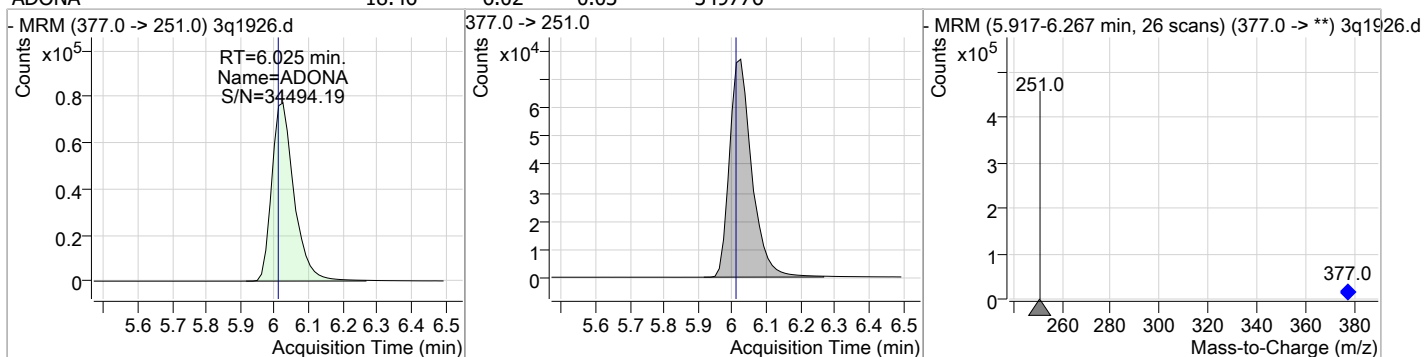


7.6.13

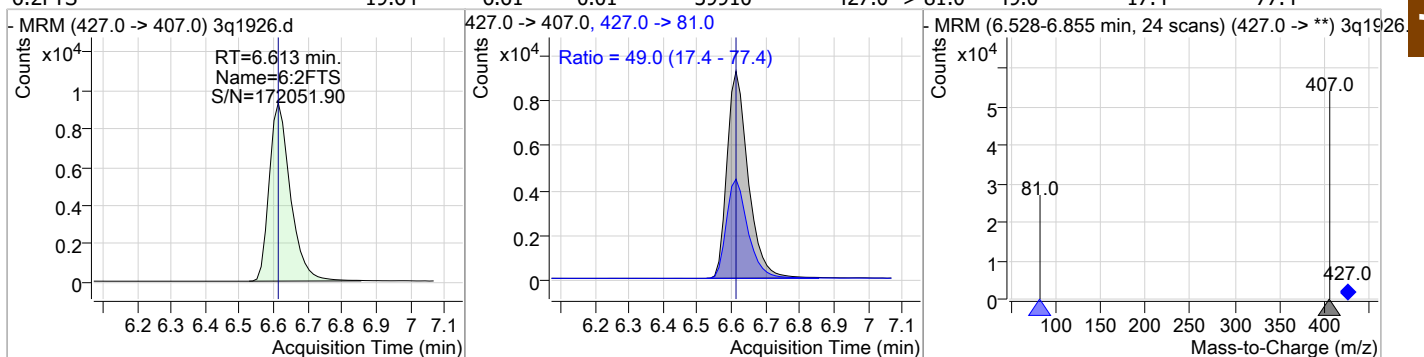
7

Perfluorinated Compounds by LC/MS/MS

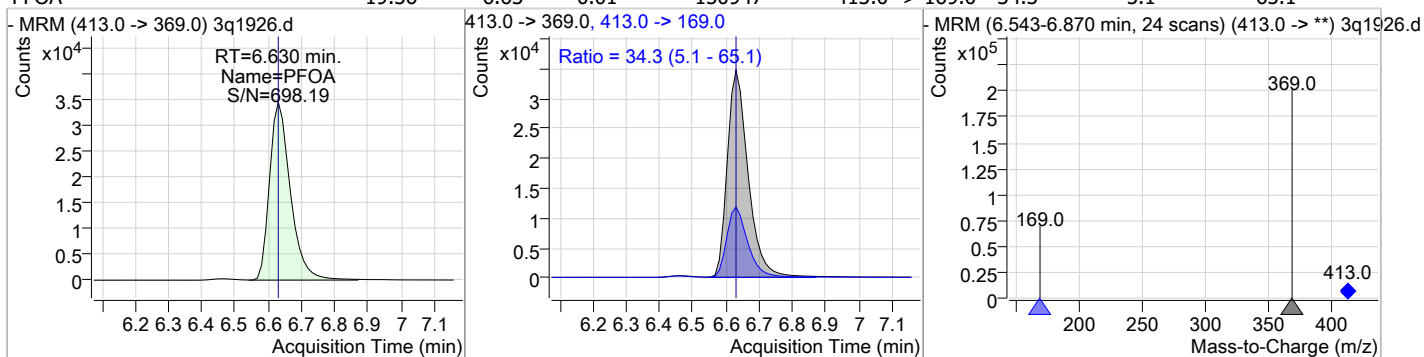
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



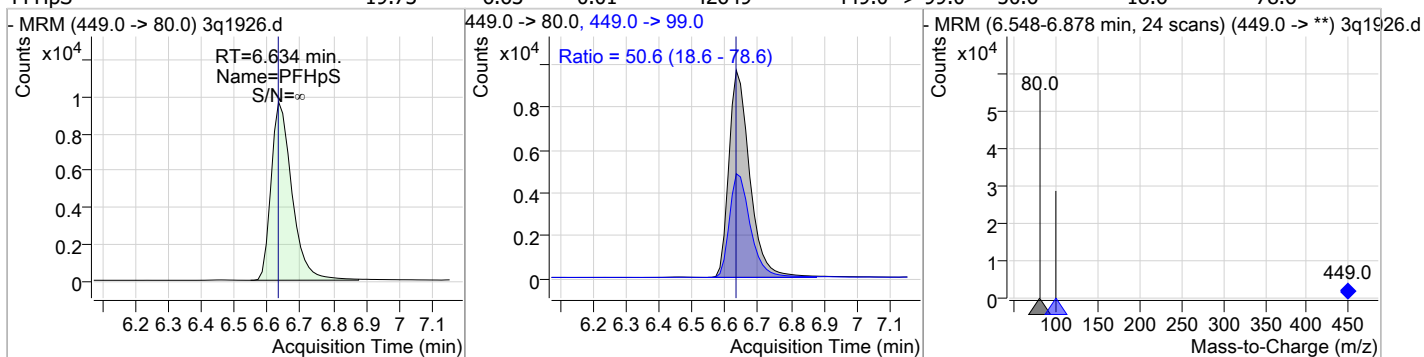
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



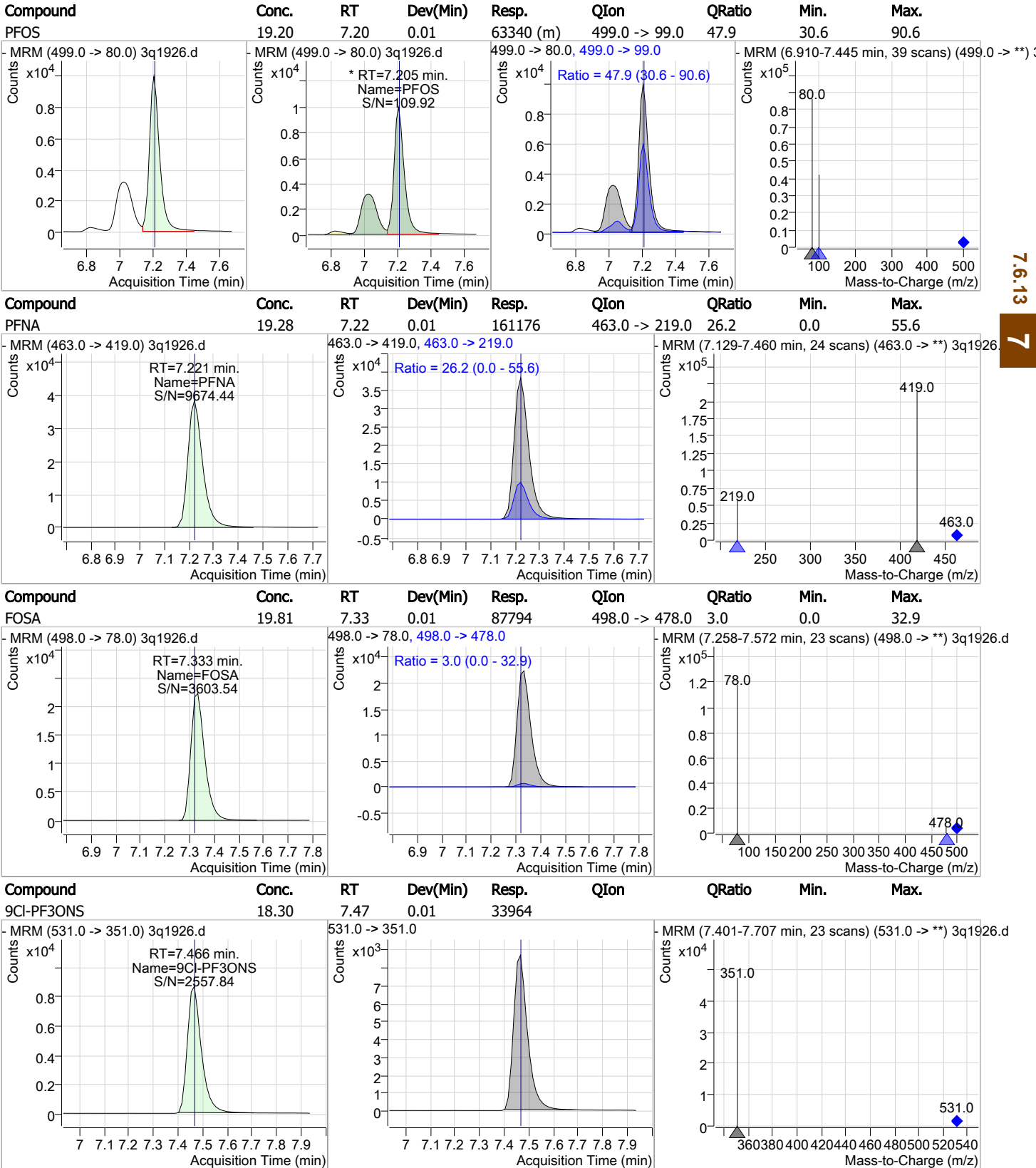
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Perfluorinated Compounds by LC/MS/MS

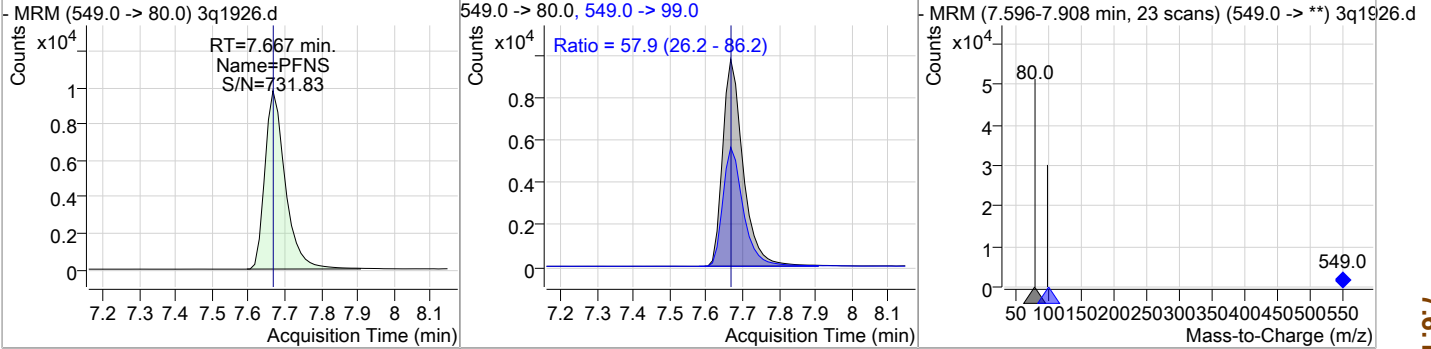


7.6.13
7

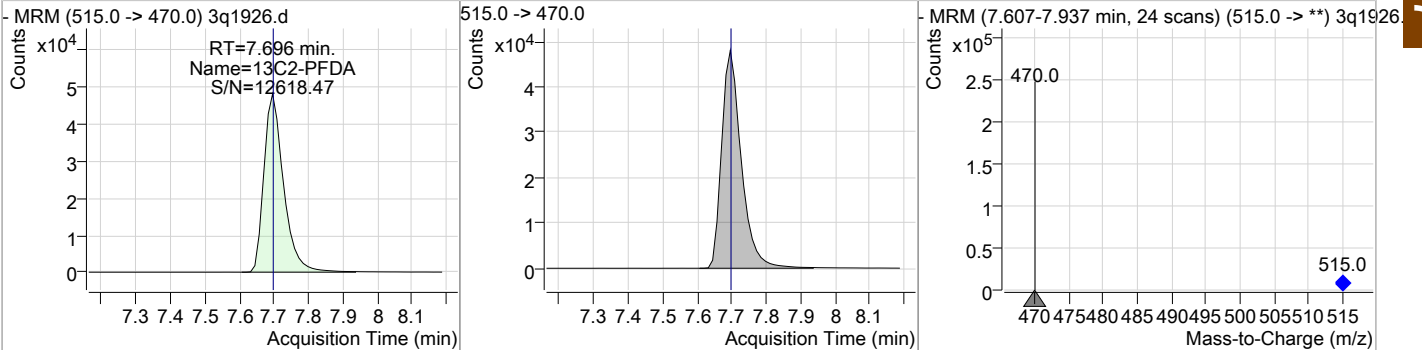


Perfluorinated Compounds by LC/MS/MS

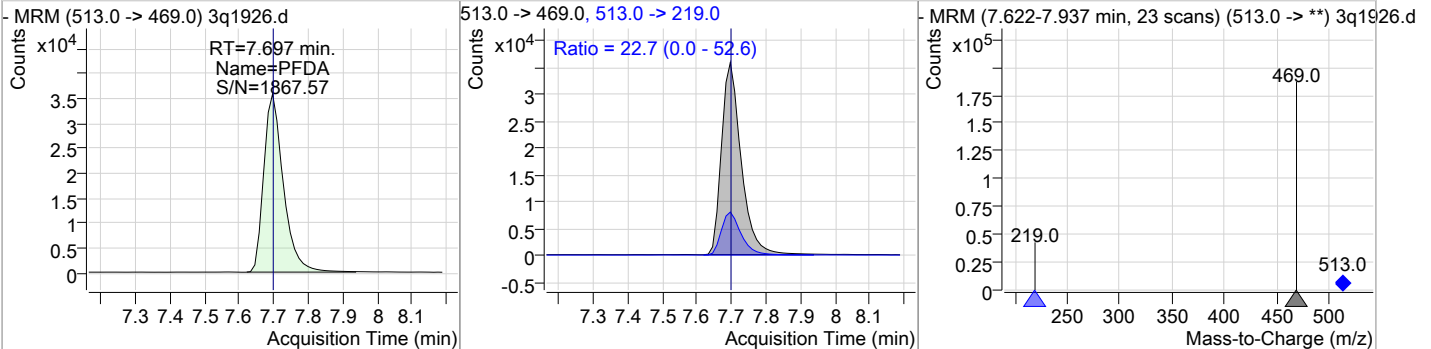
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	20.84	7.67	0.01	38030	549.0 -> 99.0	57.9	26.2	86.2



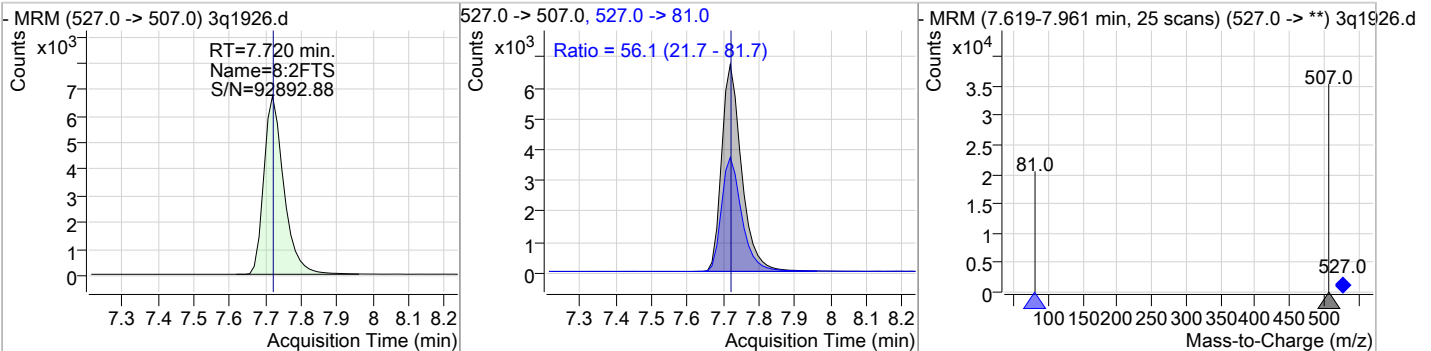
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.18	7.70	0.01	189725				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	21.17	7.70	0.01	141061	513.0 -> 219.0	22.7	0.0	52.6

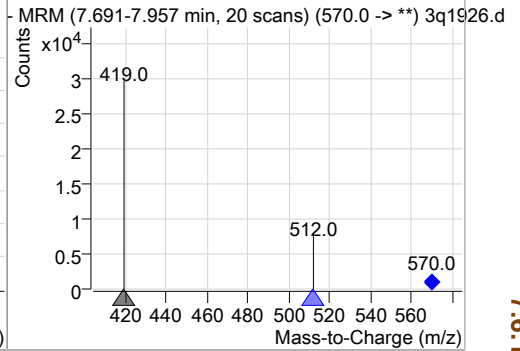
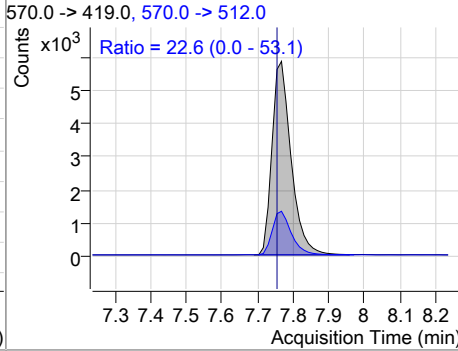
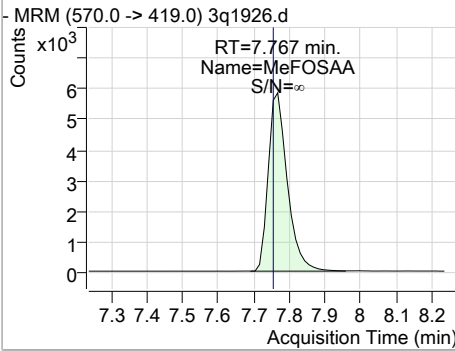


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	20.30	7.72	0.01	26031	527.0 -> 81.0	56.1	21.7	81.7

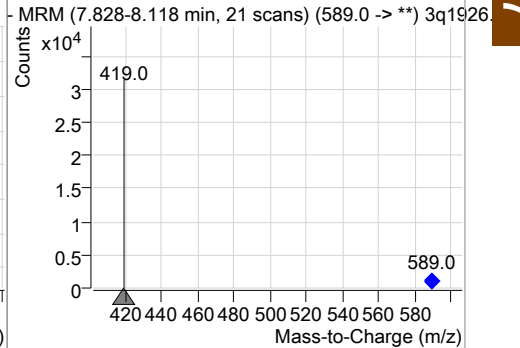
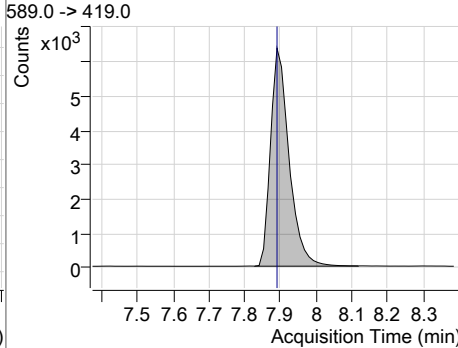
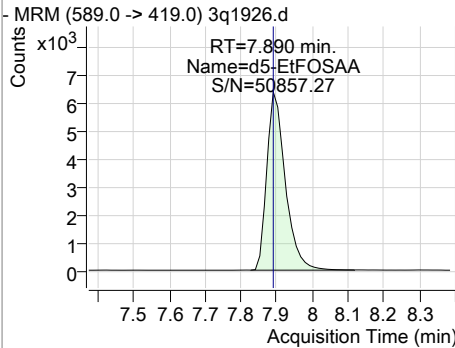


Perfluorinated Compounds by LC/MS/MS

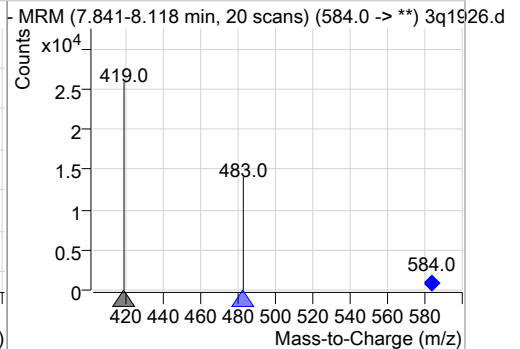
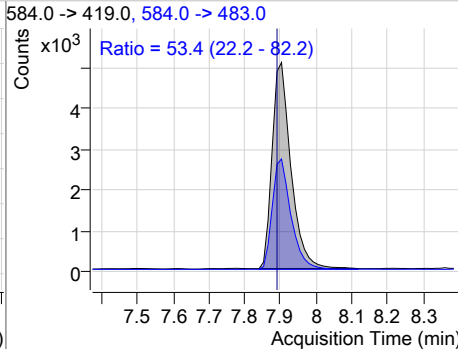
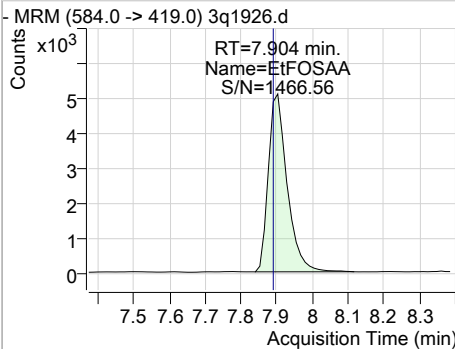
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	20.40	7.77	0.01	21678	570.0 -> 512.0	22.6	0.0	53.1



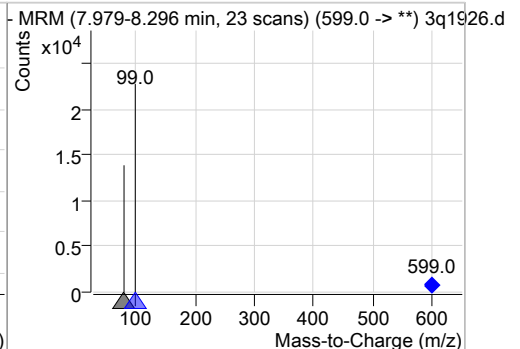
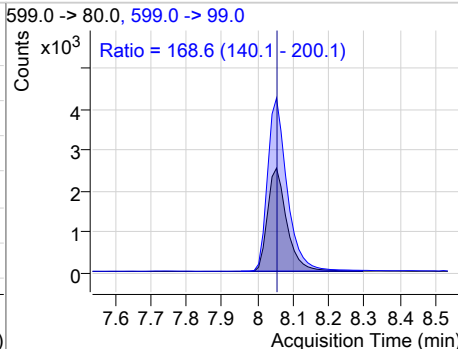
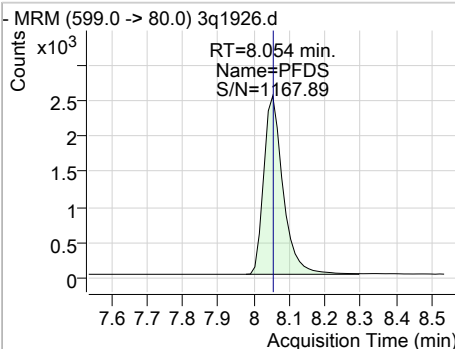
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	21.28	7.89	0.00	22872	589.0 -> 419.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	21.37	7.90	0.01	18527	584.0 -> 483.0	53.4	22.2	82.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	20.40	8.05	0.01	9498	599.0 -> 99.0	168.6	140.1	200.1

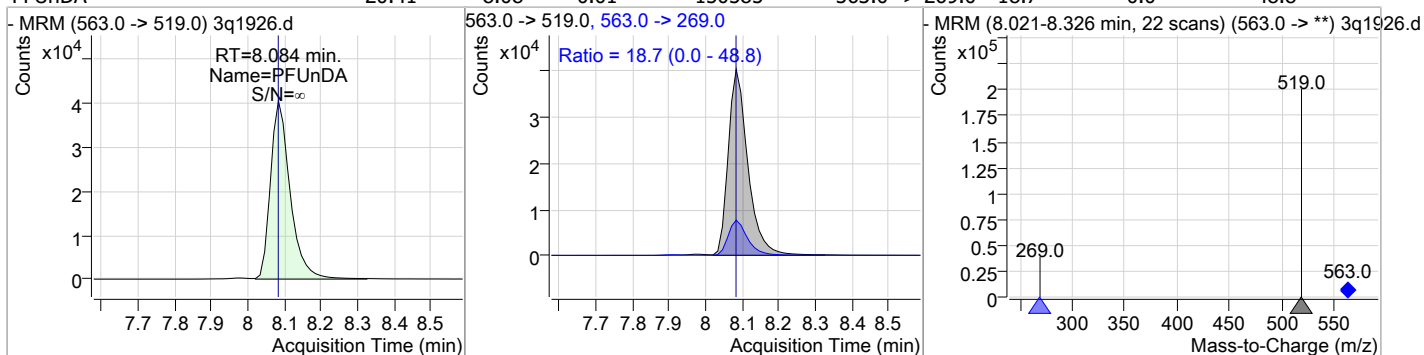


7.6.13
7

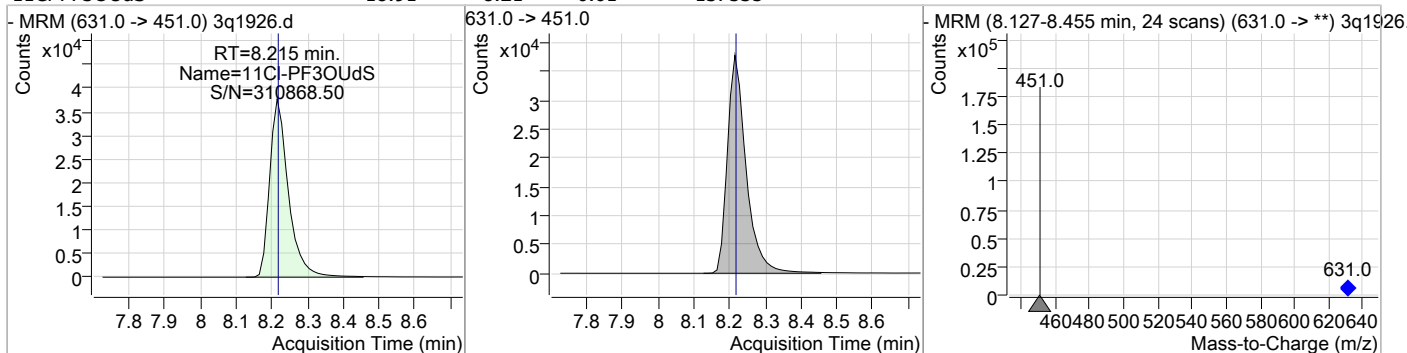


Perfluorinated Compounds by LC/MS/MS

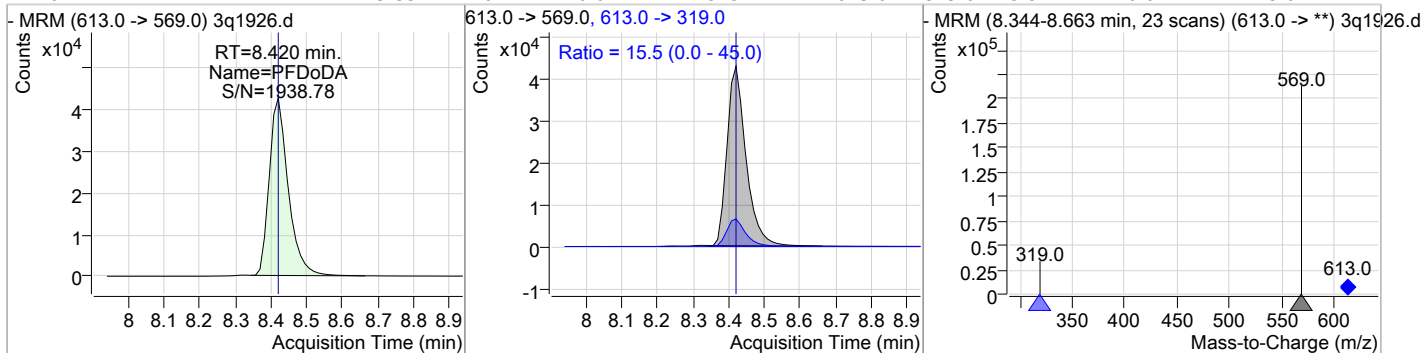
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	20.41	8.08	0.01	150585	563.0 -> 269.0	18.7	0.0	48.8



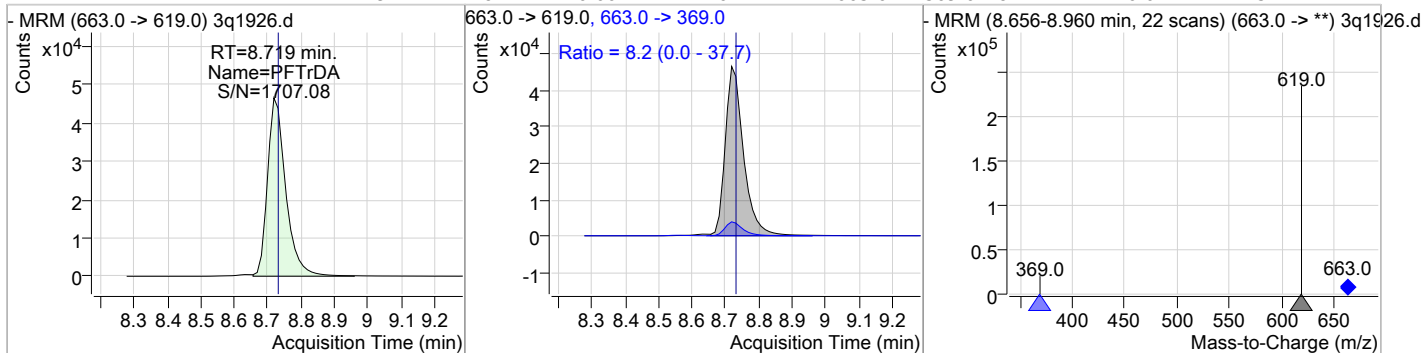
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	18.91	8.21	0.01	137535				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.33	8.42	0.01	157527	613.0 -> 319.0	15.5	0.0	45.0

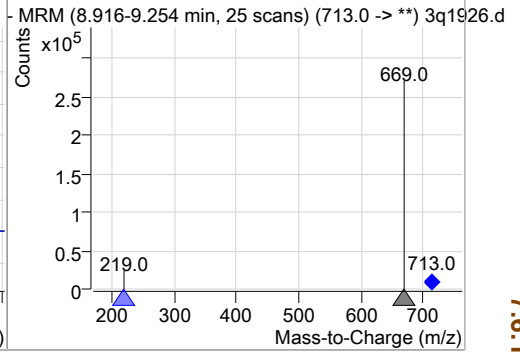
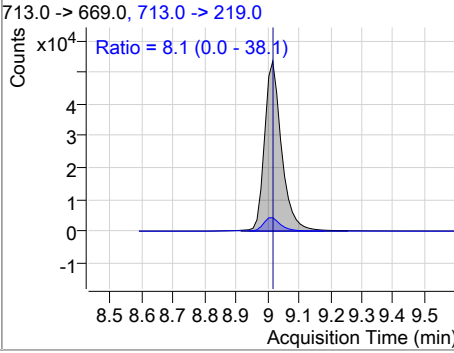
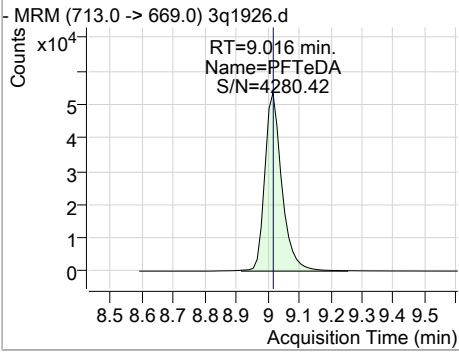


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	19.77	8.72	0.00	176722	663.0 -> 369.0	8.2	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	18.96	9.02	0.01	201787	713.0 -> 219.0	8.1	0.0	38.1



7.6.13
7

Manual Integration Approval Summary

Sample Number: S3Q52-CC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1926.D **Analyst approved:** 03/18/19 11:19 Nancy Saunders
Injection Time: 03/15/19 18:41 **Supervisor approved:** 03/18/19 13:49 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.96	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.21	Split peak

7.6.13.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1938.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 11:36:59 AM
 Sample Name : CC52-20
 Vial : P1-A7
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74124,S3Q53,125,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)	QValue
Internal Standards						
13C2-6:2FTS	6.587	429.0 -> 409.0	29627	20.00 µg/L	-0.013	
13C2-PFDoDA	8.407	615.0 -> 570.0	128194	20.00 µg/L	0.000	
13C2-PFOA	6.604	415.0 -> 370.0	135004	20.00 µg/L	-0.013	
13C3-PFPeA	3.546	266.0 -> 222.0	103425	20.00 µg/L	-0.013	
13C4-PFOS	7.179	503.0 -> 80.0	45114	20.00 µg/L	-0.013	
d3-MeFOSAA	7.741	573.0 -> 419.0	14586	20.00 µg/L	-0.013	
System Monitoring Compounds						
13C2-PFDA	7.683	515.0 -> 470.0	146177	20.31 µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 101.6%		
13C2-PFHxA	4.949	315.0 -> 270.0	148024	19.87 µg/L	-0.013	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 99.4%		
d5-EtFOSAA	7.878	589.0 -> 419.0	16830	19.97 µg/L	-0.013	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 99.9%		
13C3-HFPO-DA	5.240	287.0 -> 169.0	55640	102.07 µg/L	-0.013	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 102.1%		
Target Compounds						
4:2FTS	4.846	327.0 -> 307.0	36721	19.74 µg/L		99
6:2FTS	6.588	427.0 -> 407.0	30687	19.77 µg/L		100
8:2FTS	7.707	527.0 -> 507.0	19801	20.23 µg/L		98
EtFOSAA	7.878	584.0 -> 419.0	13643	20.07 µg/L		98
FOSA	7.295	498.0 -> 78.0	68136	19.61 µg/L		99
MeFOSAA	7.742	570.0 -> 419.0	16297	19.56 µg/L		100
PFBA	1.689	213.0 -> 169.0	40063	16.47 µg/L		100
PFBS	3.866	299.0 -> 80.0	50507	18.53 µg/L		100
PFDA	7.684	513.0 -> 469.0	106944	20.97 µg/L		99
PFDoDA	8.408	613.0 -> 569.0	121096	19.69 µg/L		99
PFDS	8.041	599.0 -> 80.0	7837	20.27 µg/L		98
PFHpA	5.889	363.0 -> 319.0	201132	19.82 µg/L		100
PFHpS	6.609	449.0 -> 80.0	34835	19.40 µg/L		100
PFHxA	4.950	313.0 -> 269.0	71099	19.47 µg/L		98
PFHxS	5.932	399.0 -> 80.0	38897	19.13 µg/L	m	96
PFNA	7.196	463.0 -> 419.0	132544	20.71 µg/L		99
PFNS	7.655	549.0 -> 80.0	31450	20.75 µg/L		99
PFOA	6.605	413.0 -> 369.0	115255	19.31 µg/L		100
PFOS	7.180	499.0 -> 80.0	51531	18.80 µg/L	m	83
PFPeA	3.550	263.0 -> 219.0	155319	21.38 µg/L		100
PFPeS	5.080	349.0 -> 80.0	30809	21.18 µg/L		100
PFTeDA	9.016	713.0 -> 669.0	160708	20.01 µg/L		100
PFTrDA	8.719	663.0 -> 619.0	134283	19.90 µg/L		100
PFUnDA	8.071	563.0 -> 519.0	112263	20.16 µg/L		99
ADONA	5.987	377.0 -> 251.0	279736	19.28 µg/L		100
9Cl-PF3ONS	7.441	531.0 -> 351.0	26989	19.00 µg/L		100
11Cl-PF3OUdS	8.202	631.0 -> 451.0	118623	21.31 µg/L		100
HFPO-DA	5.245	329.0 -> 169.0	180597	103.09 µg/L		99

7.6.14
7

Perfluorinated Compounds by LC/MS/MS

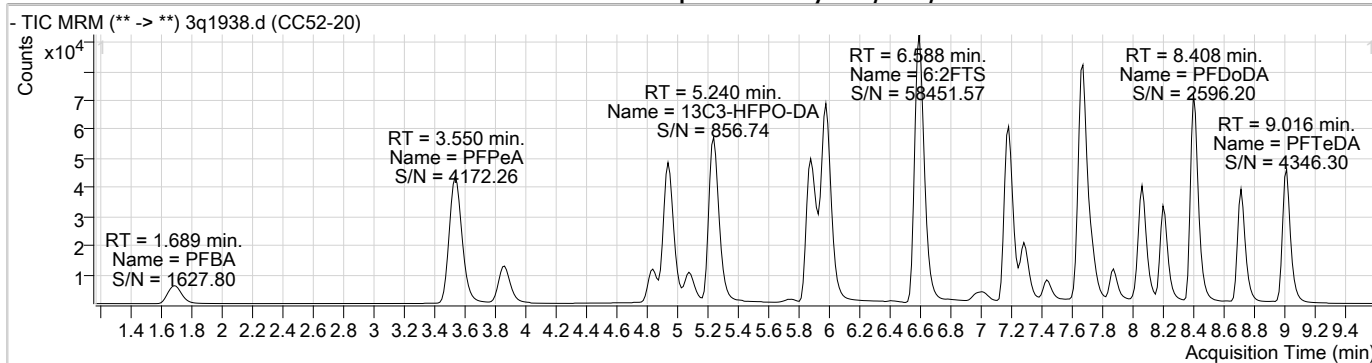
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

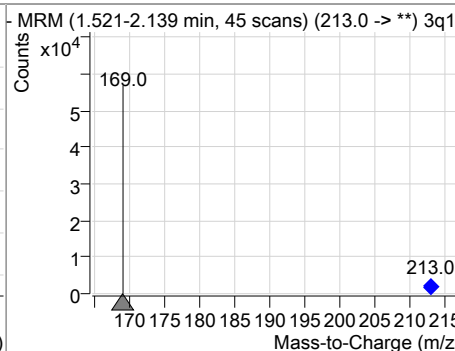
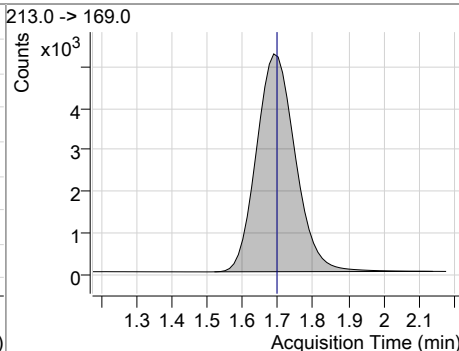
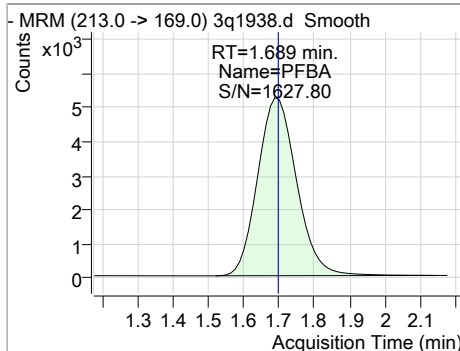
7.6.14

7

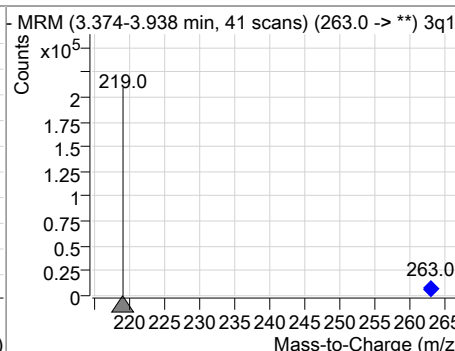
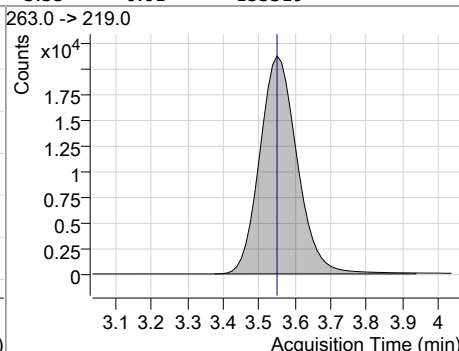
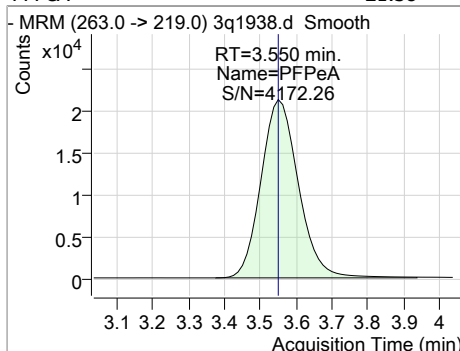
Perfluorinated Compounds by LC/MS/MS



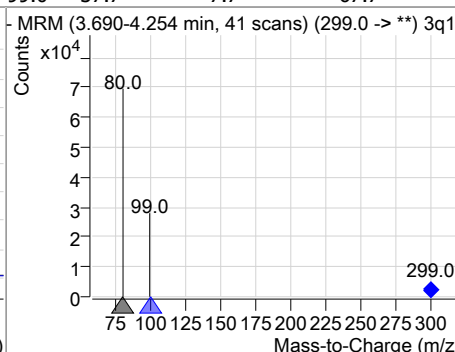
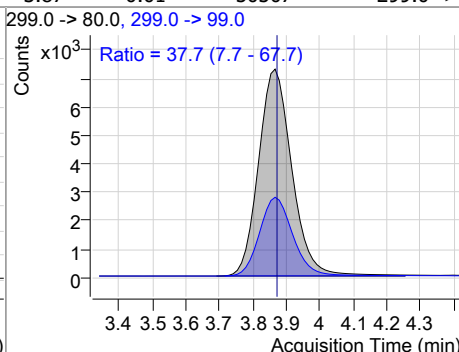
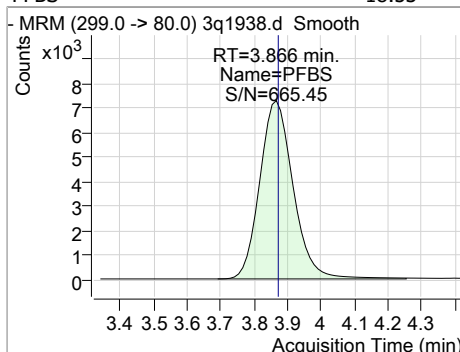
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	16.47	1.69	-0.01	40063				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	21.38	3.55	-0.01	155319				

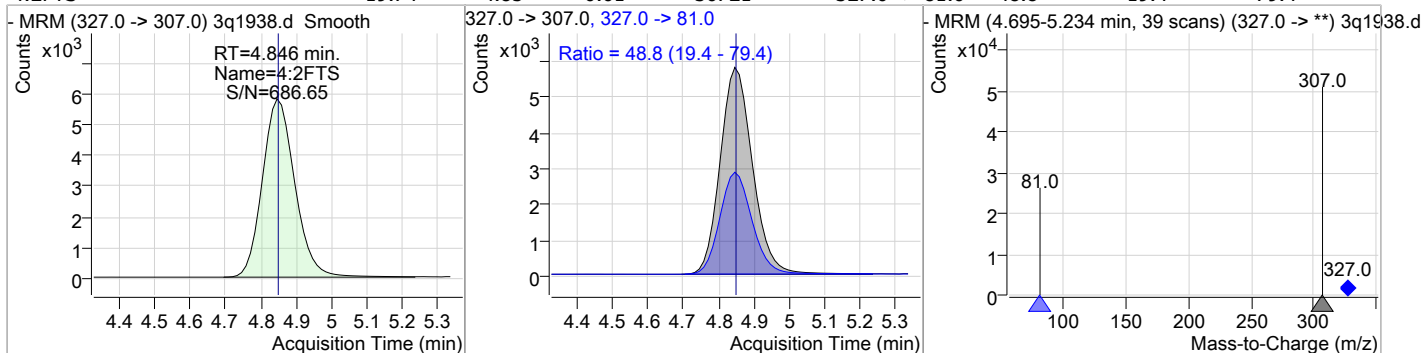


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	18.53	3.87	-0.01	50507	299.0 -> 99.0	37.7	7.7	67.7

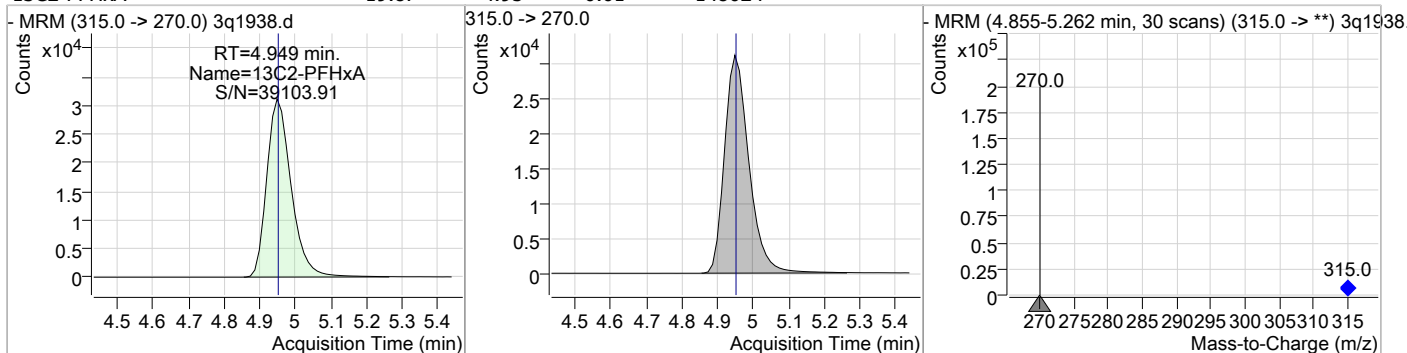


Perfluorinated Compounds by LC/MS/MS

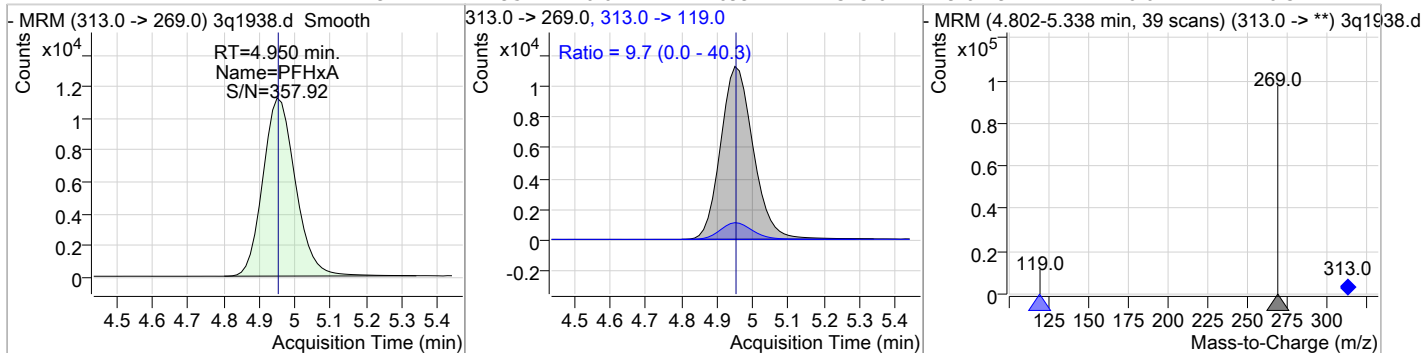
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	19.74	4.85	-0.01	36721	327.0 -> 81.0	48.8	19.4	79.4



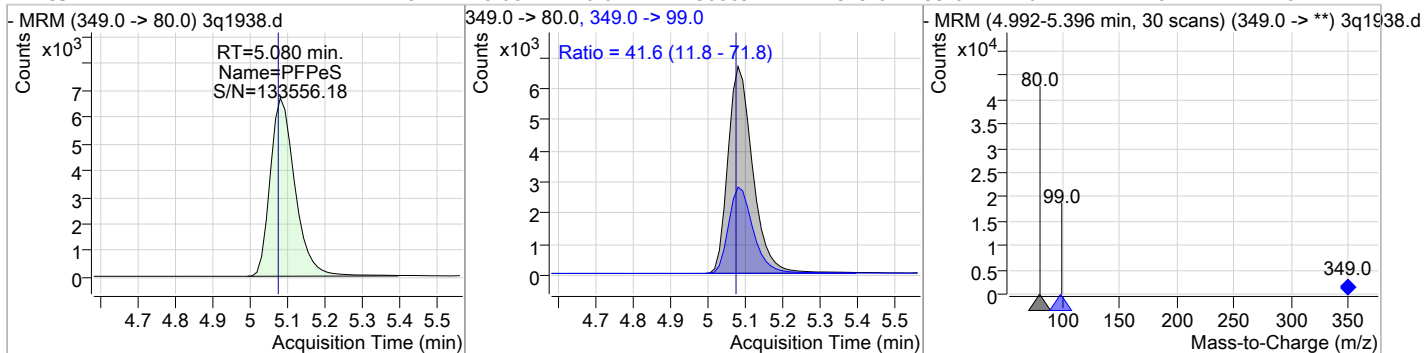
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.87	4.95	-0.01	148024				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	19.47	4.95	-0.01	71099	313.0 -> 119.0	9.7	0.0	40.3

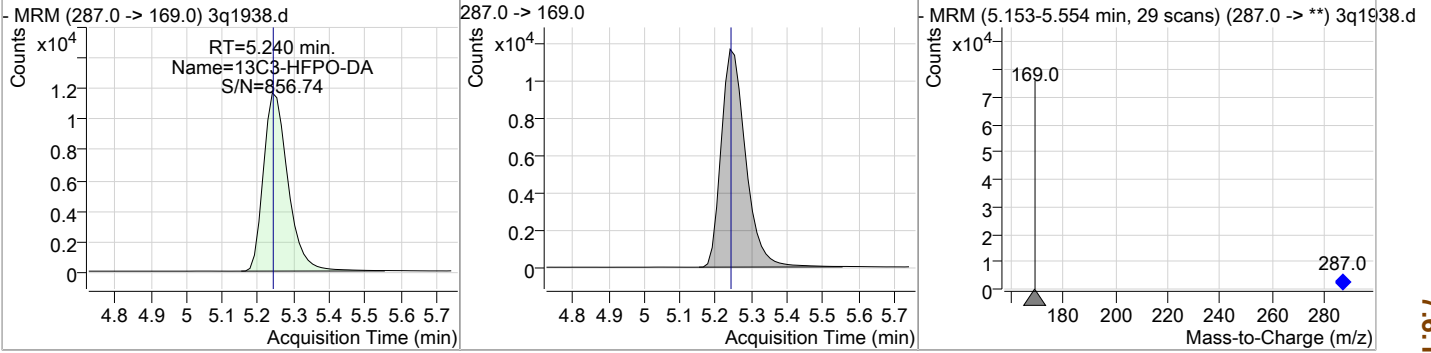


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	21.18	5.08	-0.01	30809	349.0 -> 99.0	41.6	11.8	71.8

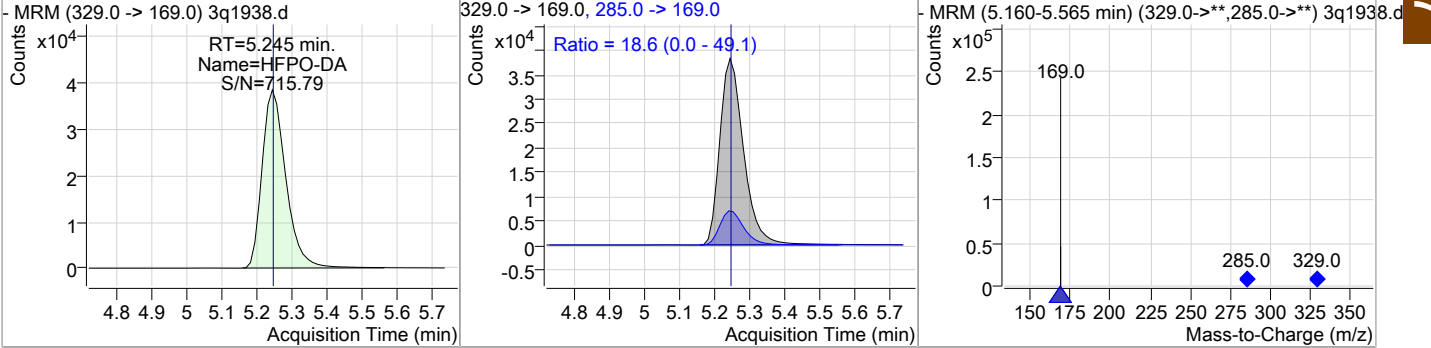


Perfluorinated Compounds by LC/MS/MS

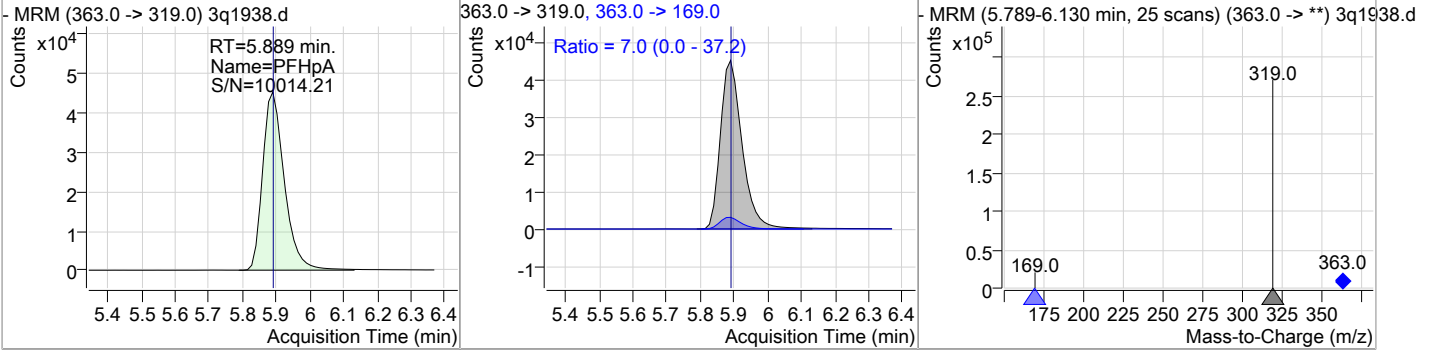
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	102.07	5.24	-0.01	55640				



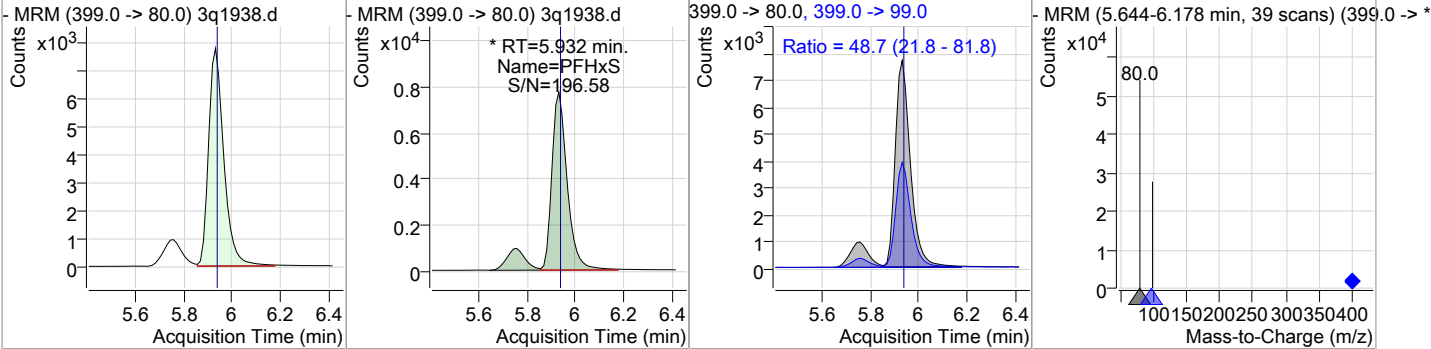
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	103.09	5.25	-0.01	180597	285.0 -> 169.0	18.6	0.0	49.1



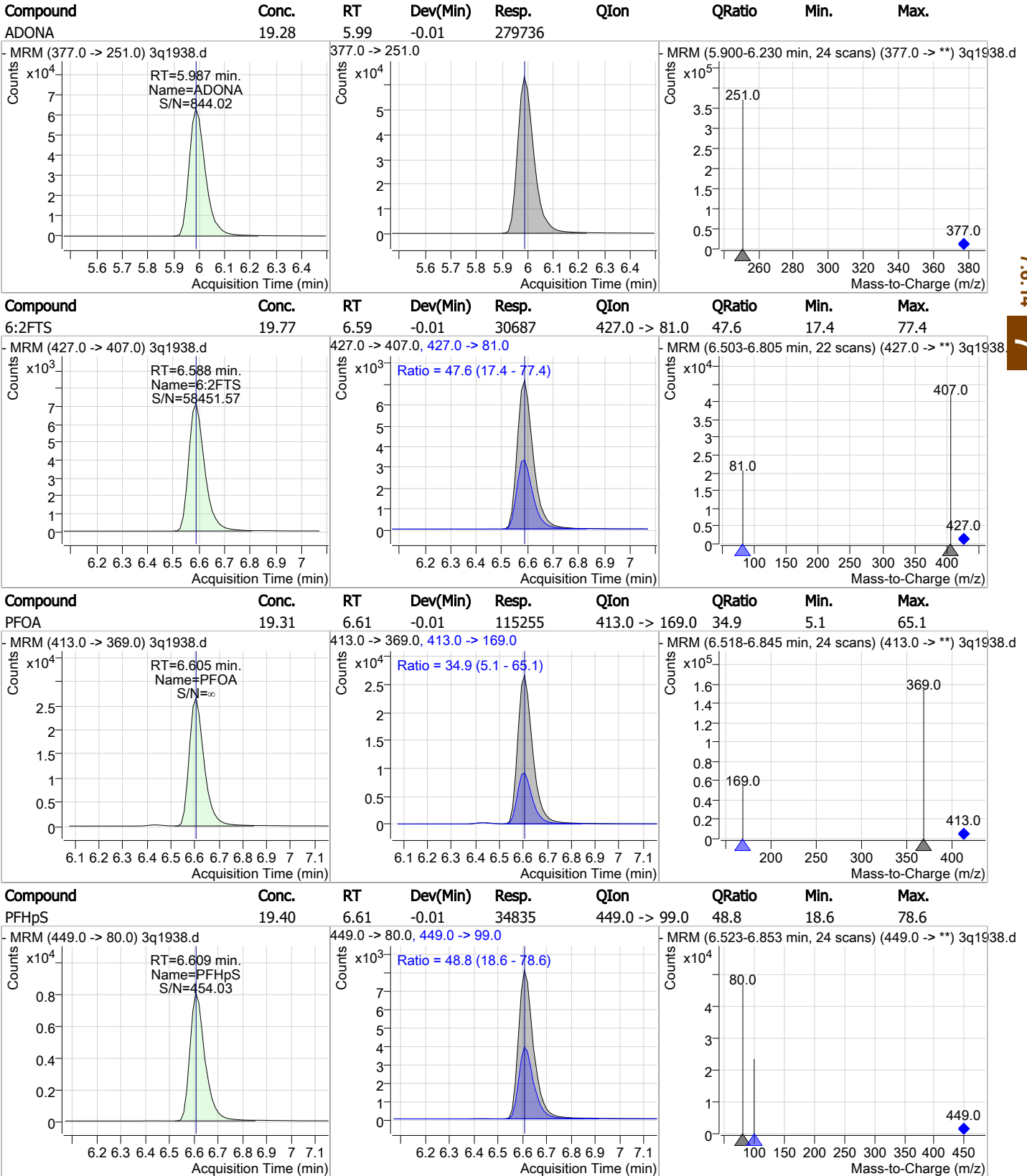
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	19.82	5.89	-0.01	201132	363.0 -> 169.0	7.0	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	19.13	5.93	-0.01	38897 (m)	399.0 -> 99.0	48.7	21.8	81.8



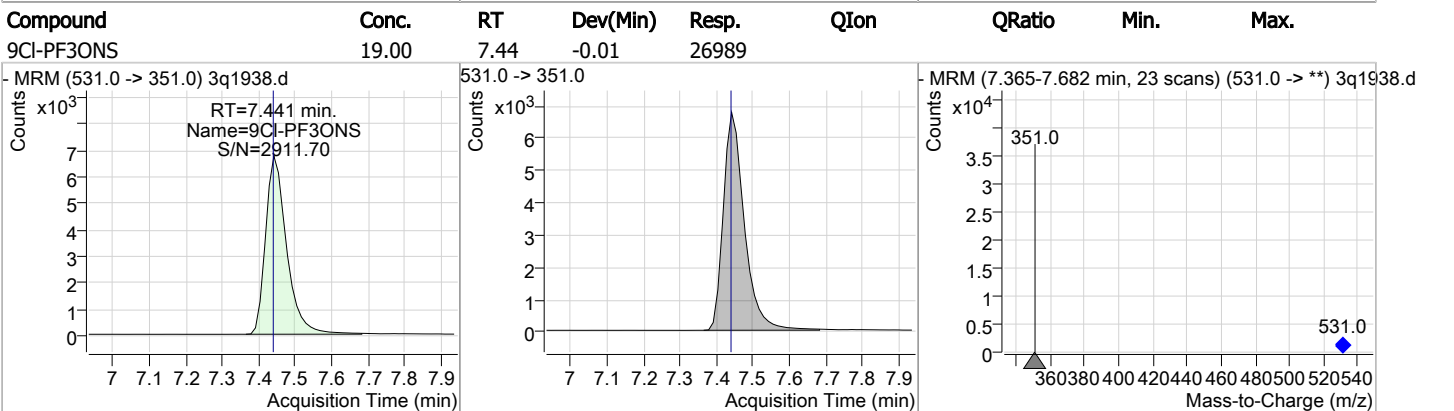
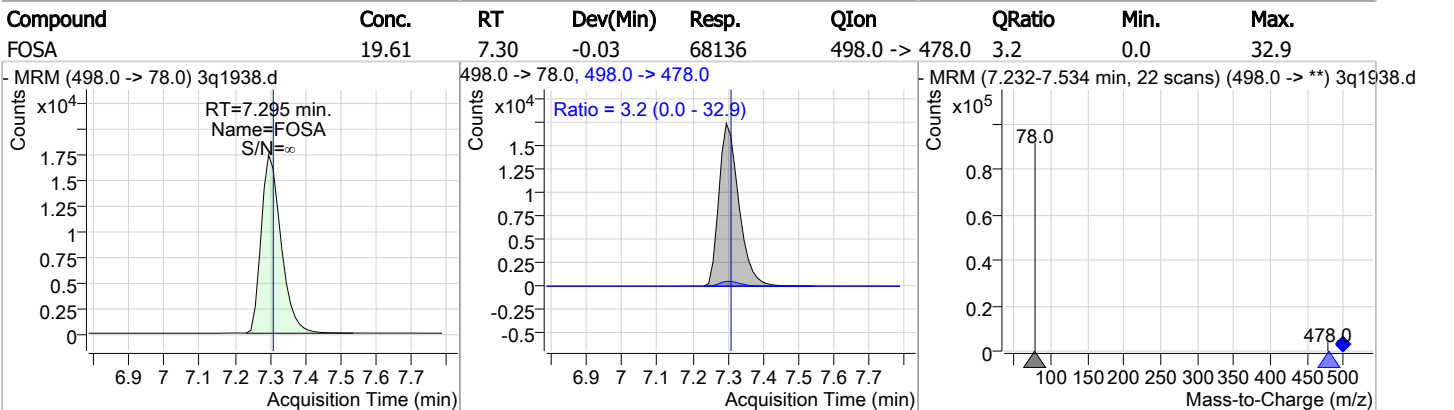
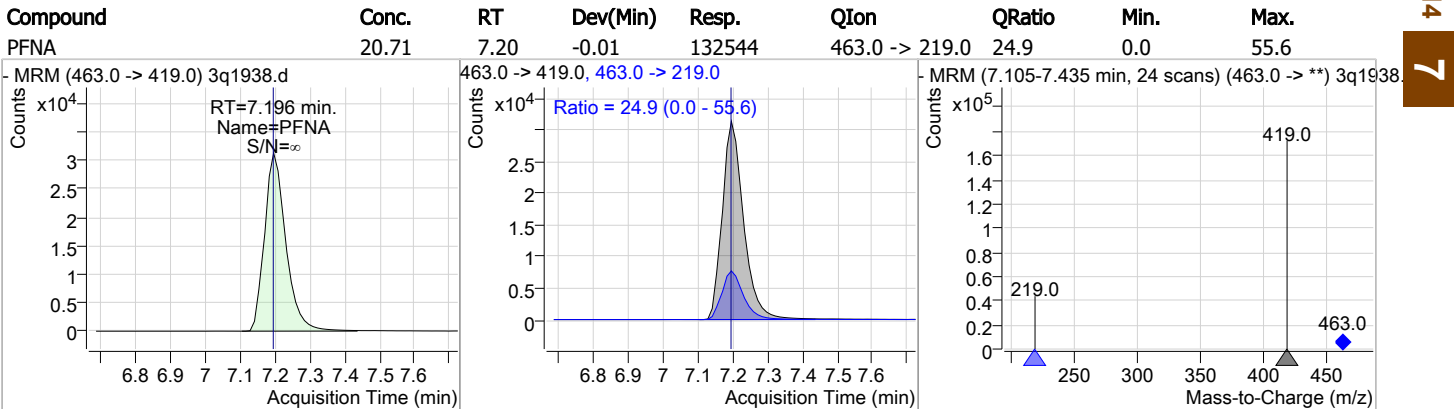
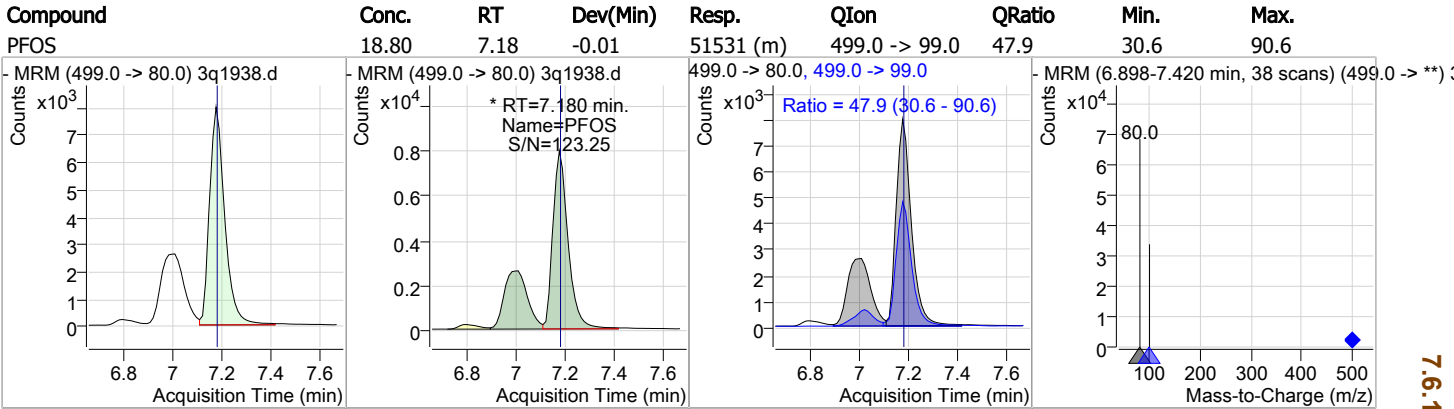
Perfluorinated Compounds by LC/MS/MS



7.6.14 7

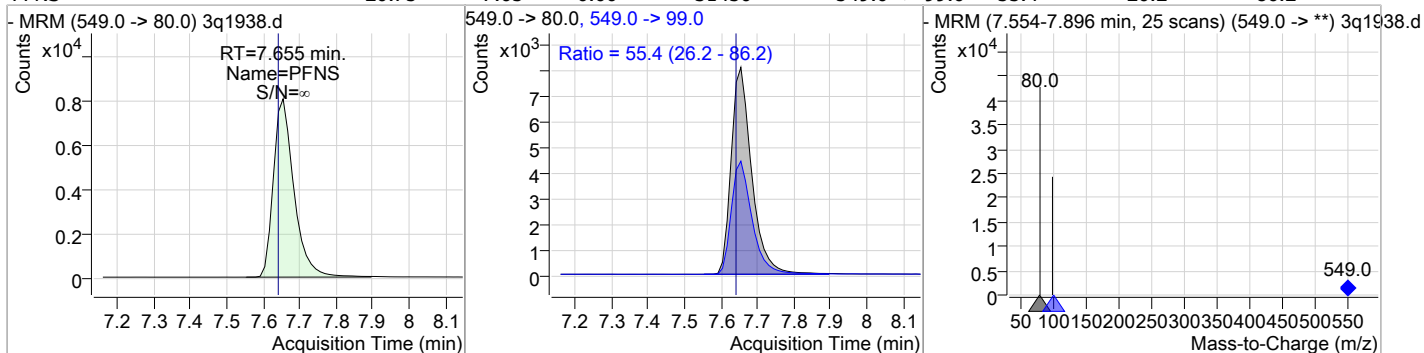


Perfluorinated Compounds by LC/MS/MS

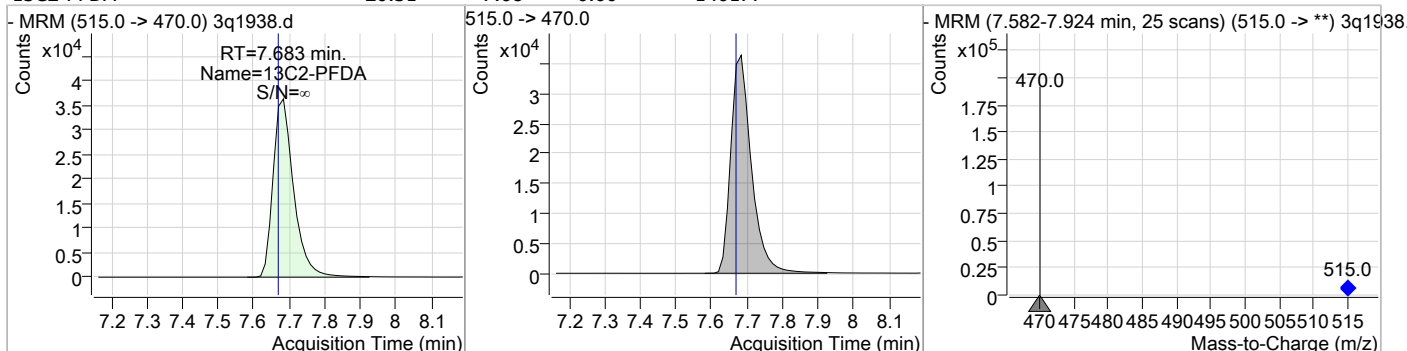


Perfluorinated Compounds by LC/MS/MS

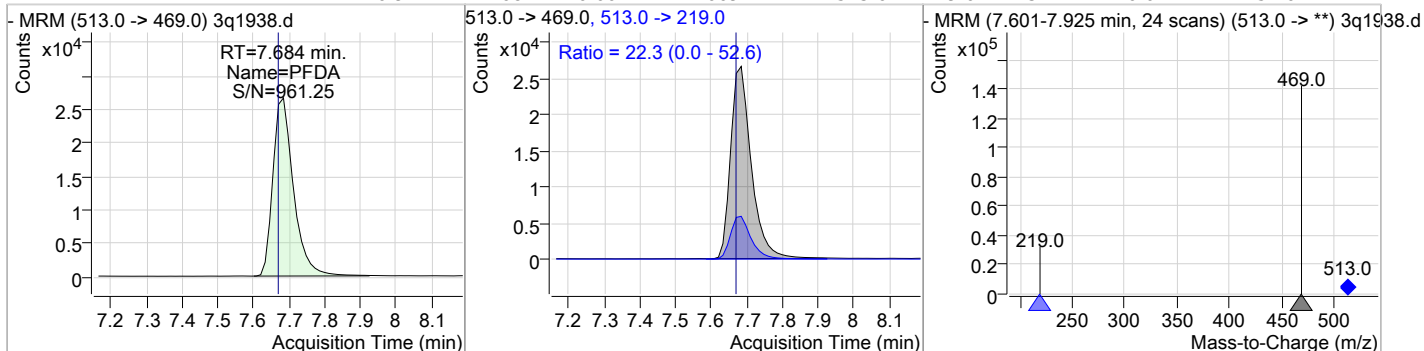
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	20.75	7.65	0.00	31450	549.0 -> 99.0	55.4	26.2	86.2



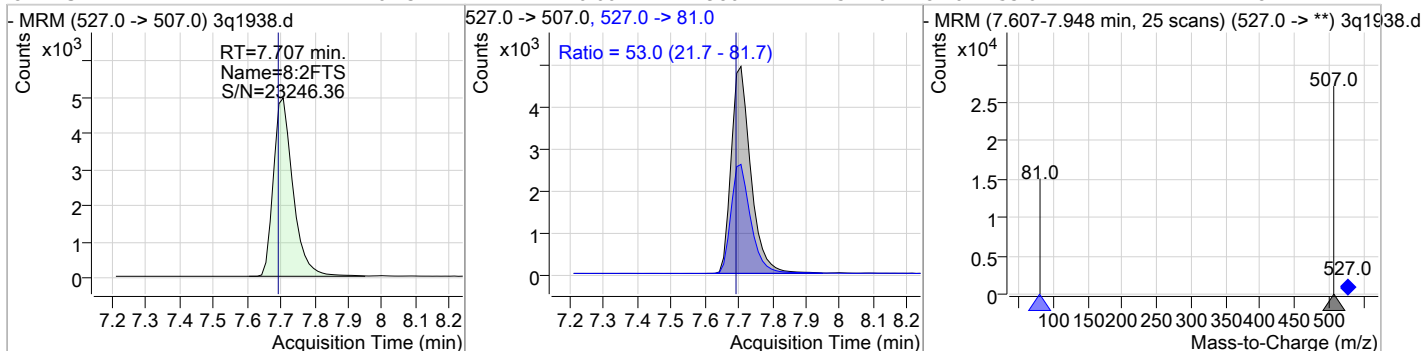
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.31	7.68	0.00	146177				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.97	7.68	0.00	106944	513.0 -> 219.0	22.3	0.0	52.6

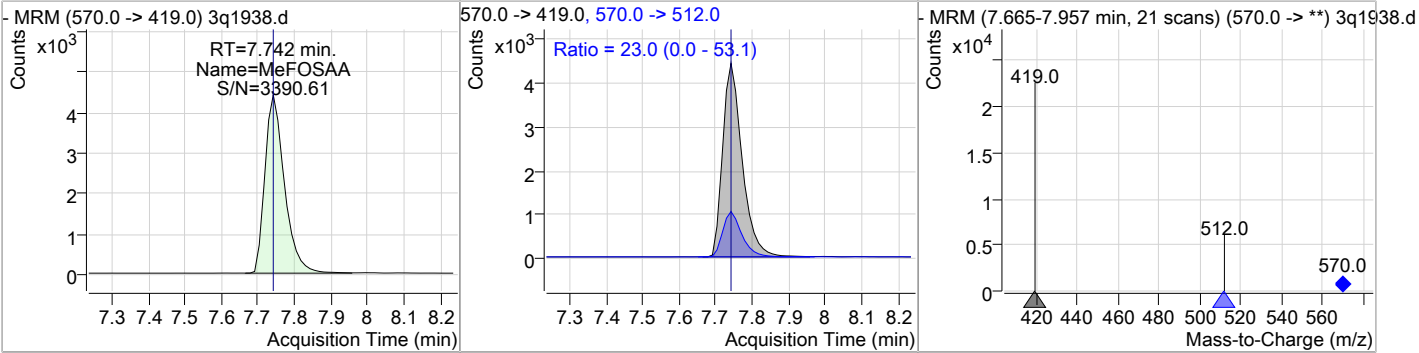


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	20.23	7.71	0.00	19801	527.0 -> 81.0	53.0	21.7	81.7

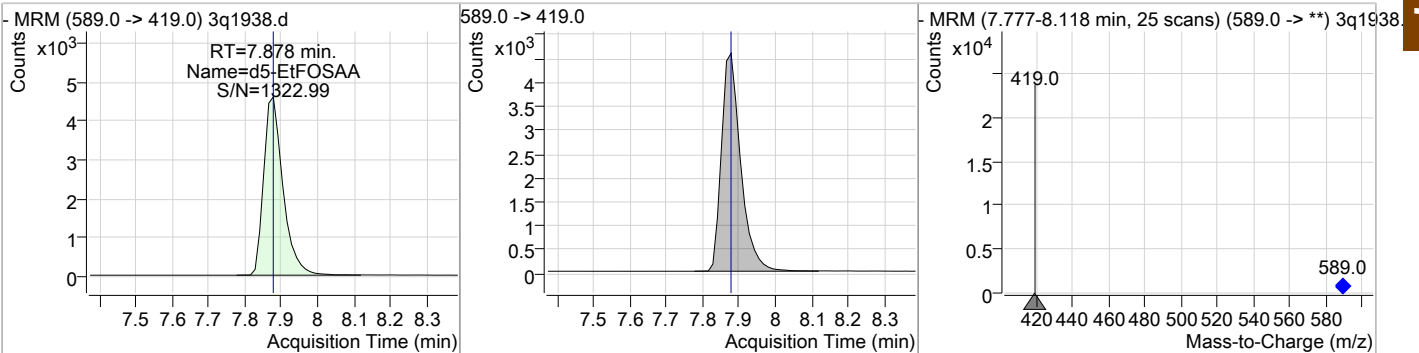


Perfluorinated Compounds by LC/MS/MS

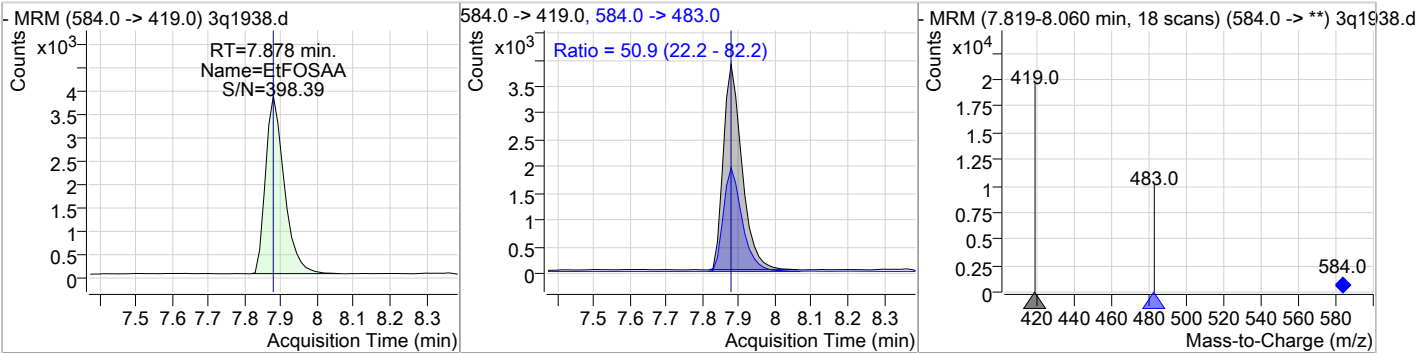
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	19.56	7.74	-0.01	16297	570.0 -> 512.0	23.0	0.0	53.1



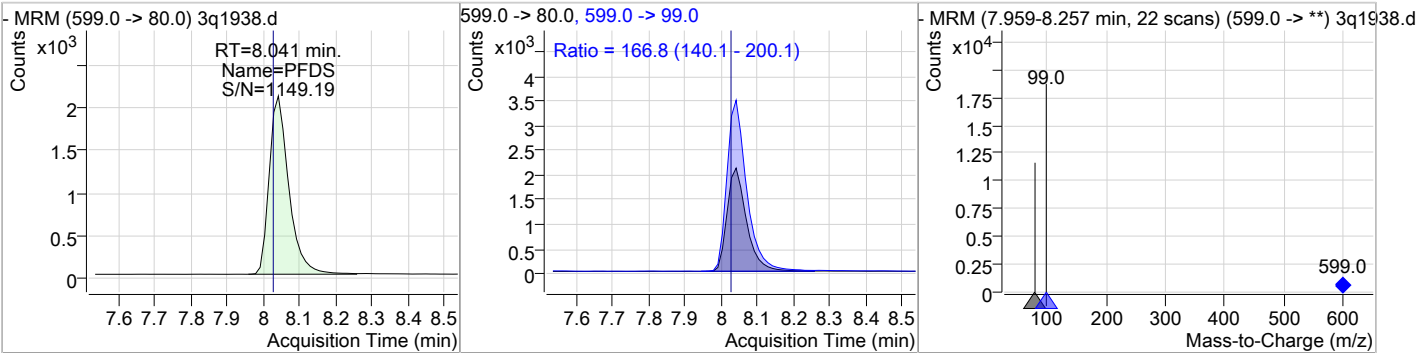
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	19.97	7.88	-0.01	16830				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	20.07	7.88	-0.01	13643	584.0 -> 483.0	50.9	22.2	82.2

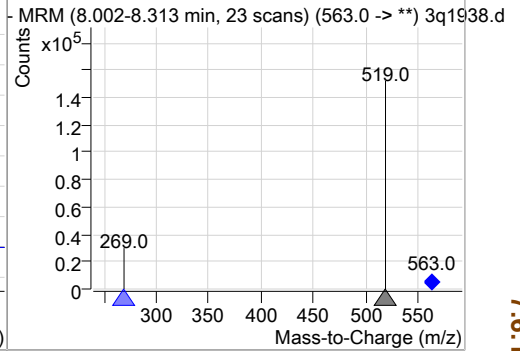
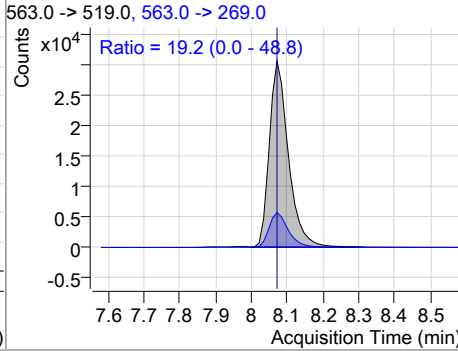
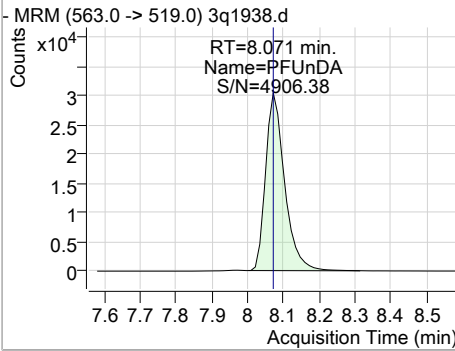


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	20.27	8.04	0.00	7837	599.0 -> 99.0	166.8	140.1	200.1

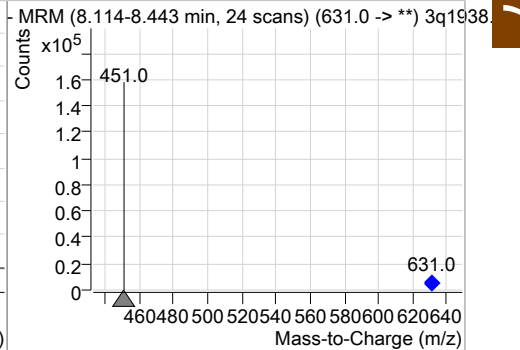
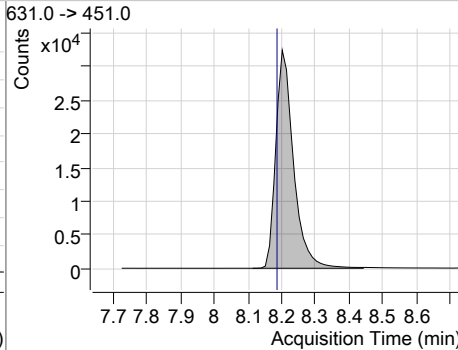
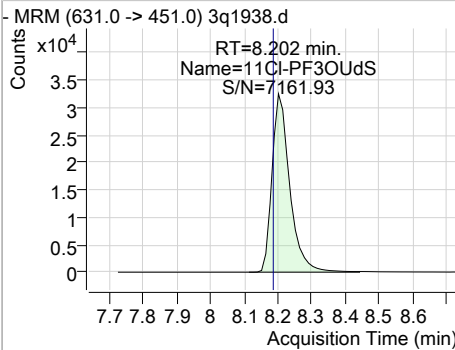


Perfluorinated Compounds by LC/MS/MS

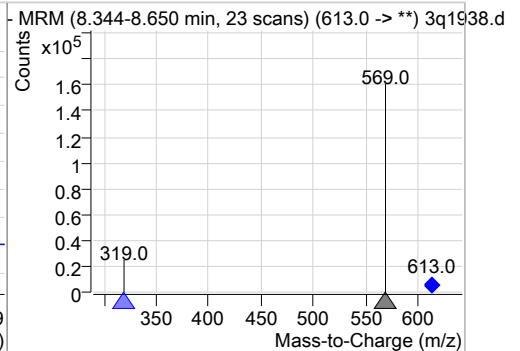
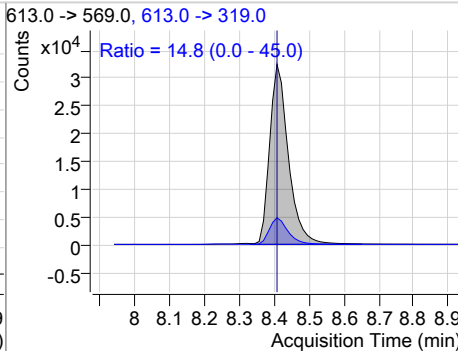
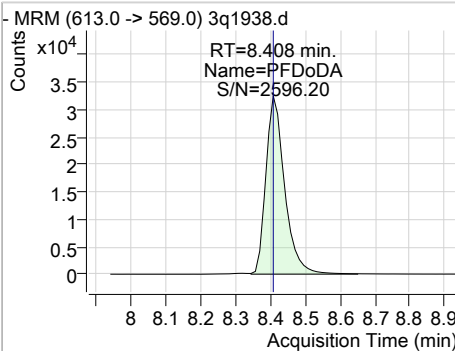
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	20.16	8.07	0.00	112263	563.0 -> 269.0	19.2	0.0	48.8



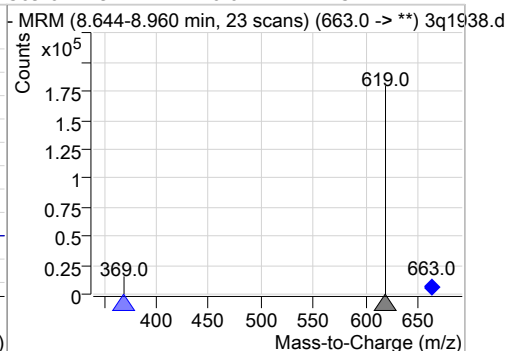
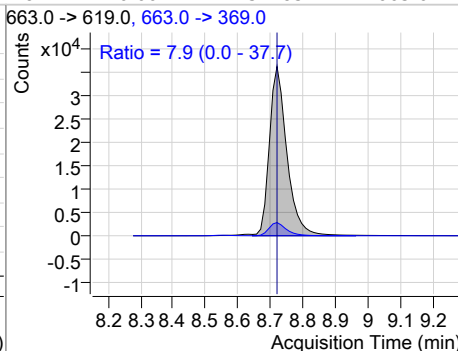
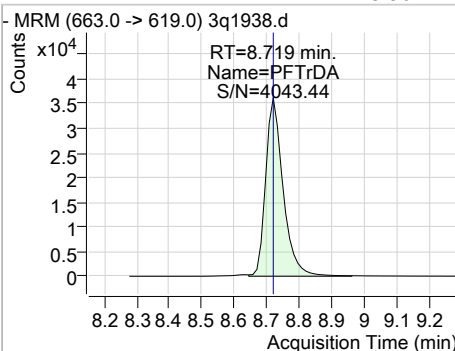
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	21.31	8.20	0.00	118623	631.0 -> 451.0	14.8	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.69	8.41	0.00	121096	613.0 -> 319.0	14.8	0.0	45.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	19.90	8.72	0.00	134283	663.0 -> 369.0	7.9	0.0	37.7

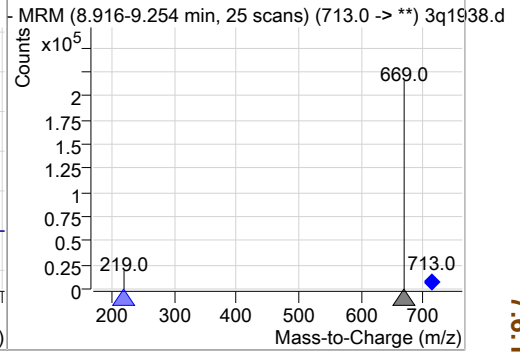
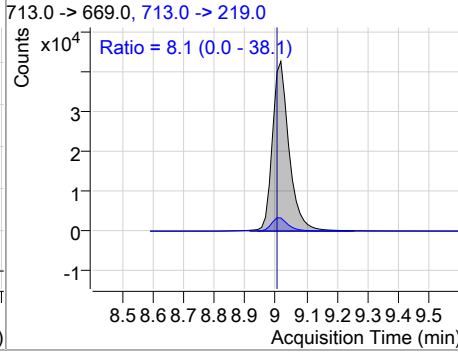
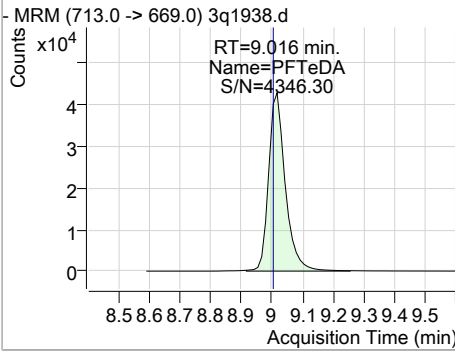


7.6.14
7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	20.01	9.02	0.01	160708	713.0 -> 219.0	8.1	0.0	38.1



7.6.14

7

Manual Integration Approval Summary

Sample Number: S3Q53-CC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1938.D **Analyst approved:** 03/18/19 15:18 Nancy Saunders
Injection Time: 03/18/19 11:36 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.93	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.18	Split peak

7.6.14.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q1948.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 3/18/2019 2:20:04 PM
 Sample Name : CC52-20
 Vial : P1-A7
 DA Method File : 537_GENX_031519_S3Q52.quantmethod.xml
 Batch Name : s3q53.batch.bin
 Sample Information : op74124,S3Q53,125,,,1.0,1,WATER

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.599	429.0 -> 409.0	32627	20.00 µg/L	0.000
13C2-PFDoDA	8.419	615.0 -> 570.0	143592	20.00 µg/L	0.013
13C2-PFOA	6.616	415.0 -> 370.0	146569	20.00 µg/L	0.000
13C3-PFPeA	3.559	266.0 -> 222.0	115292	20.00 µg/L	0.000
13C4-PFOS	7.191	503.0 -> 80.0	46790	20.00 µg/L	0.000
d3-MeFOSAA	7.754	573.0 -> 419.0	16992	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.683	515.0 -> 470.0	163325	20.92 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 104.6%	
13C2-PFHxA	4.961	315.0 -> 270.0	161307	19.94 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 99.7%	
d5-EtFOSAA	7.878	589.0 -> 419.0	19663	20.03 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.2%	
13C3-HFPO-DA	5.253	287.0 -> 169.0	61196	103.42 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 103.4%	
Target Compounds					
4:2FTS	4.858	327.0 -> 307.0	40242	19.64 µg/L	QValue
6:2FTS	6.601	427.0 -> 407.0	34179	20.00 µg/L	100
8:2FTS	7.707	527.0 -> 507.0	22441	20.81 µg/L	99
EtFOSAA	7.891	584.0 -> 419.0	16197	20.45 µg/L	99
FOSA	7.321	498.0 -> 78.0	73829	18.20 µg/L	100
MeFOSAA	7.754	570.0 -> 419.0	18700	19.27 µg/L	98
PFBA	1.689	213.0 -> 169.0	45953	17.40 µg/L	100
PFBS	3.878	299.0 -> 80.0	53511	18.93 µg/L	99
PFDA	7.684	513.0 -> 469.0	119332	21.55 µg/L	99
PFDoDA	8.408	613.0 -> 569.0	136322	19.79 µg/L	100
PFDS	8.041	599.0 -> 80.0	8026	20.01 µg/L	99
PFHpA	5.902	363.0 -> 319.0	217879	19.78 µg/L	100
PFHpS	6.621	449.0 -> 80.0	36627	19.67 µg/L	99
PFHxA	4.962	313.0 -> 269.0	76928	19.40 µg/L	99
PFHxS	5.944	399.0 -> 80.0	40994	19.44 µg/L	m 97
PFNA	7.208	463.0 -> 419.0	142992	20.58 µg/L	100
PFNS	7.655	549.0 -> 80.0	32707	20.81 µg/L	99
PFOA	6.618	413.0 -> 369.0	125914	19.43 µg/L	100
PFOS	7.192	499.0 -> 80.0	54114	19.04 µg/L	m 84
PFPeA	3.562	263.0 -> 219.0	170229	21.02 µg/L	100
PFPeS	5.093	349.0 -> 80.0	33298	20.53 µg/L	100
PFTeDA	9.016	713.0 -> 669.0	175901	19.55 µg/L	100
PFTrDA	8.719	663.0 -> 619.0	148617	19.66 µg/L	99
PFUnDA	8.084	563.0 -> 519.0	128789	20.65 µg/L	100
ADONA	5.999	377.0 -> 251.0	305776	19.41 µg/L	100
9Cl-PF3ONS	7.454	531.0 -> 351.0	28721	18.62 µg/L	100
11Cl-PF3OUdS	8.215	631.0 -> 451.0	125081	20.70 µg/L	100
HFPO-DA	5.258	329.0 -> 169.0	197301	103.75 µg/L	99

7.6.15
7

Perfluorinated Compounds by LC/MS/MS

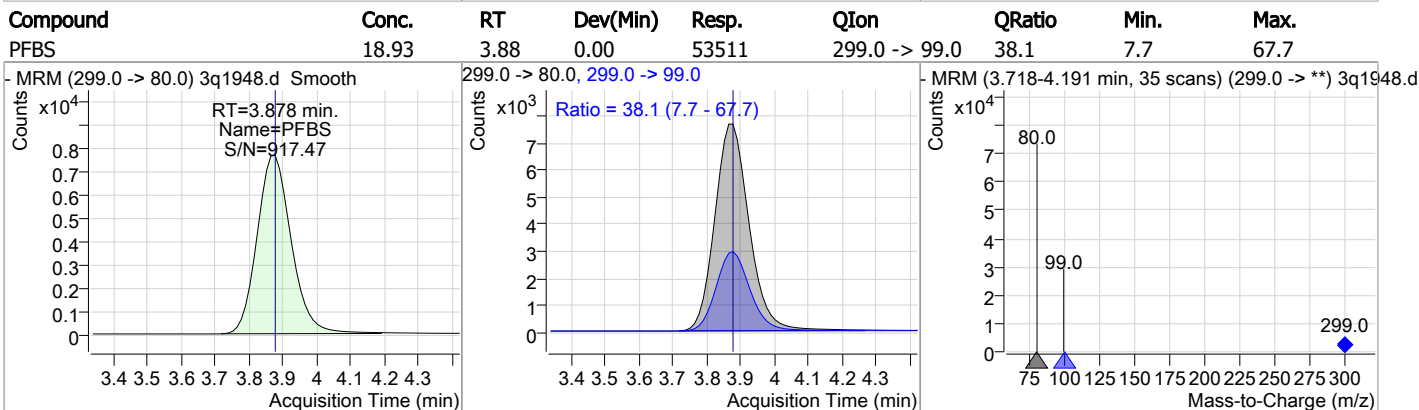
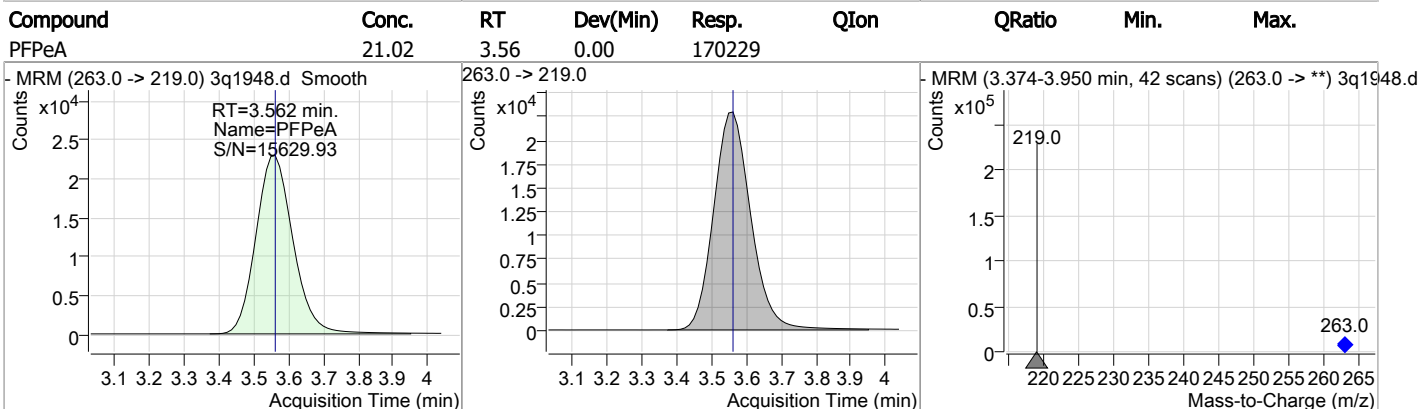
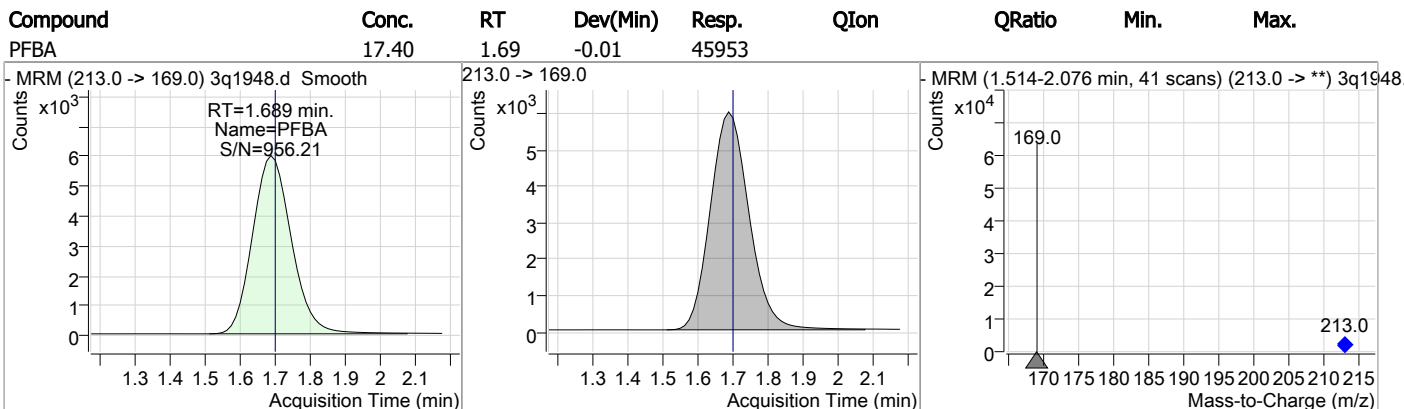
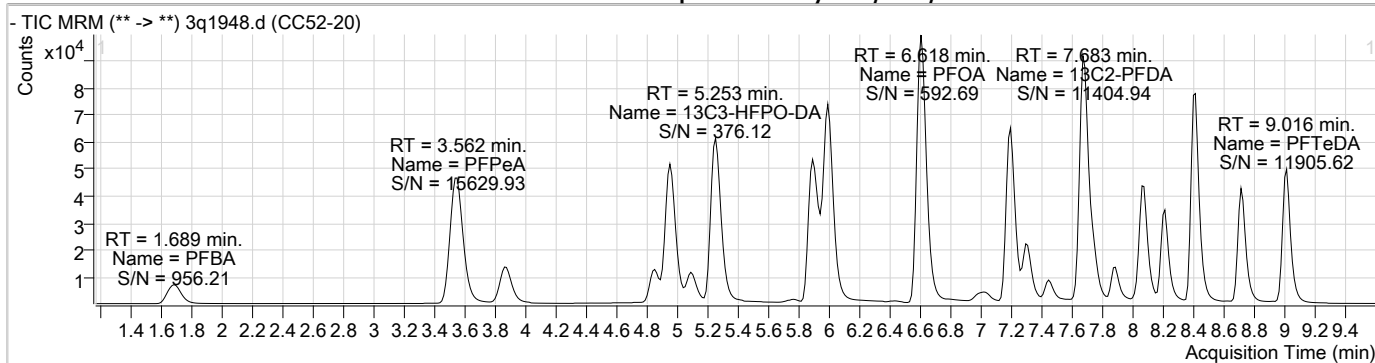
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.15

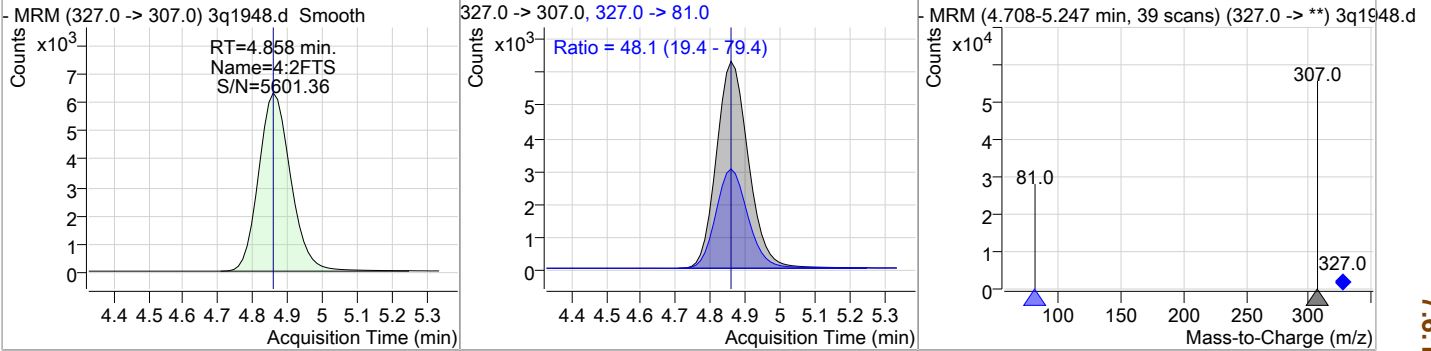
7

Perfluorinated Compounds by LC/MS/MS

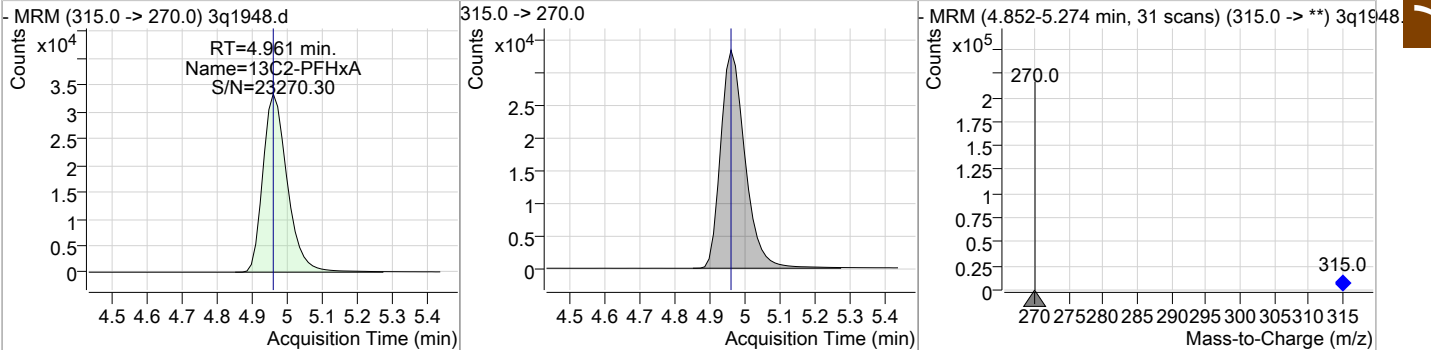


Perfluorinated Compounds by LC/MS/MS

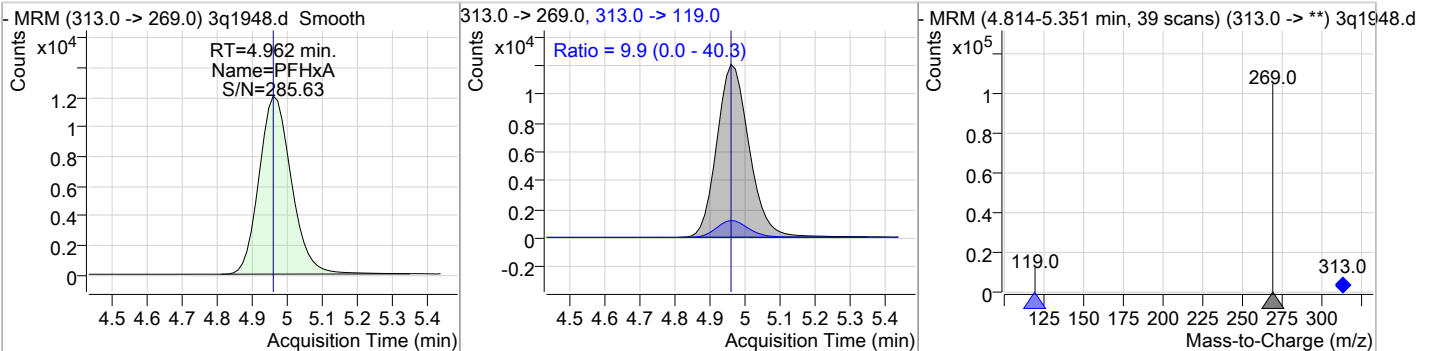
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	19.64	4.86	0.00	40242	327.0 -> 81.0	48.1	19.4	79.4



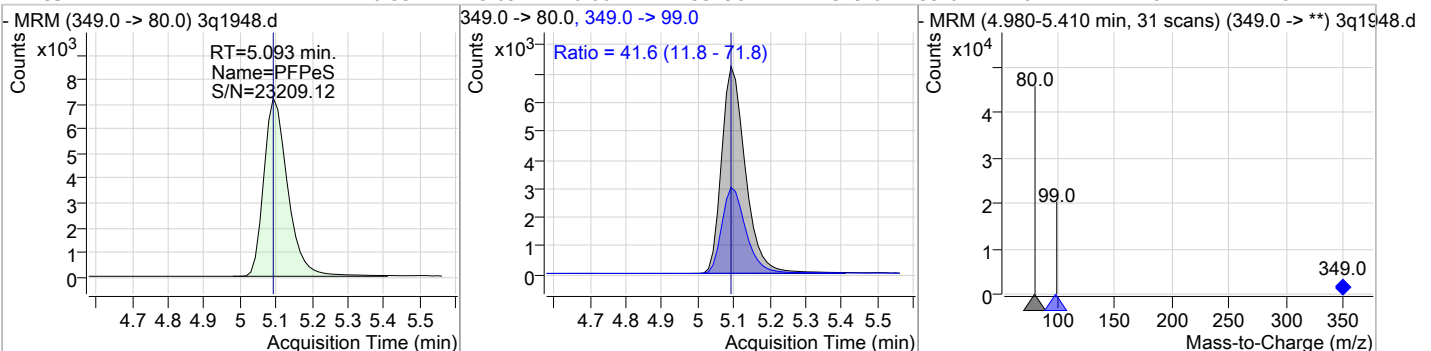
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.94	4.96	0.00	161307				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	19.40	4.96	0.00	76928	313.0 -> 119.0	9.9	0.0	40.3

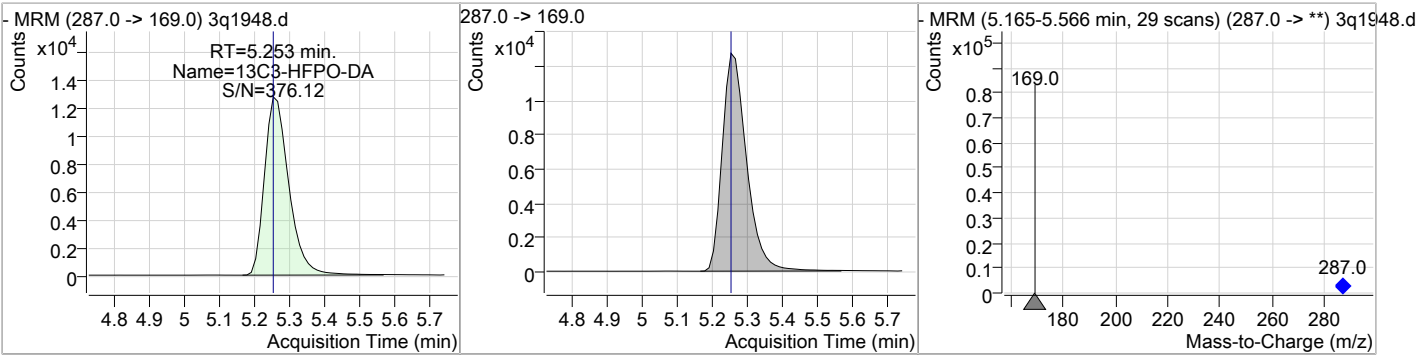


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	20.53	5.09	0.00	33298	349.0 -> 99.0	41.6	11.8	71.8

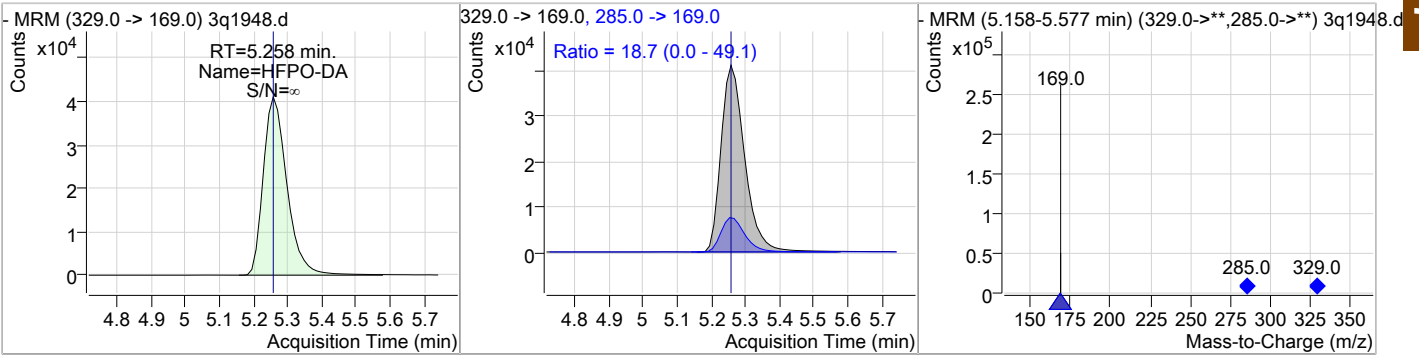


Perfluorinated Compounds by LC/MS/MS

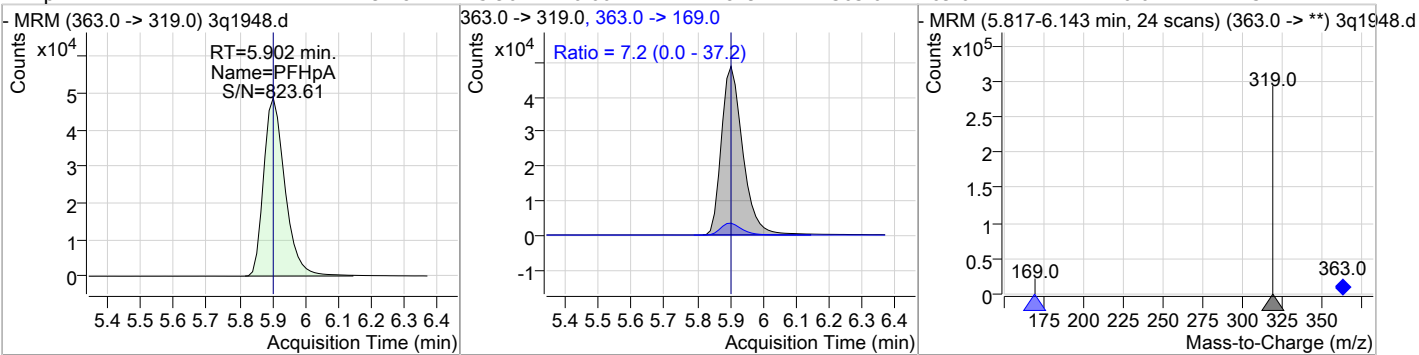
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



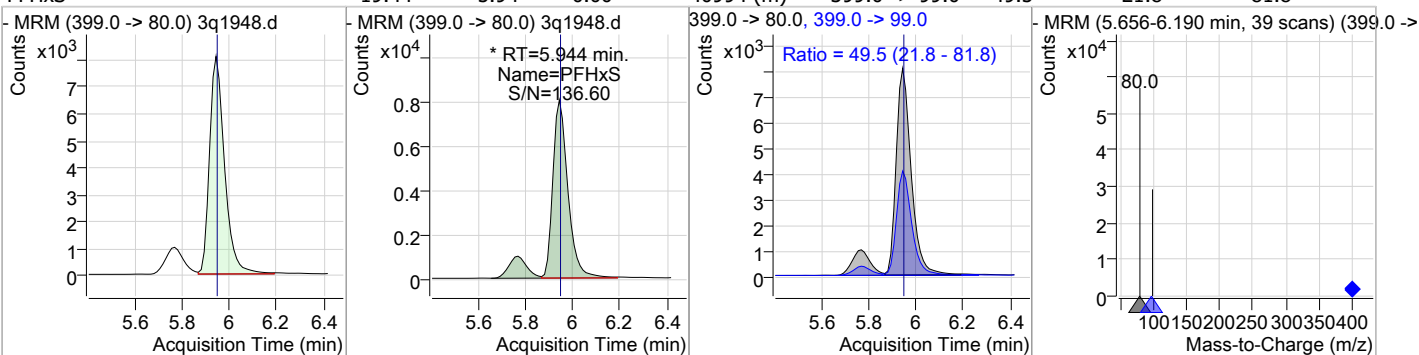
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

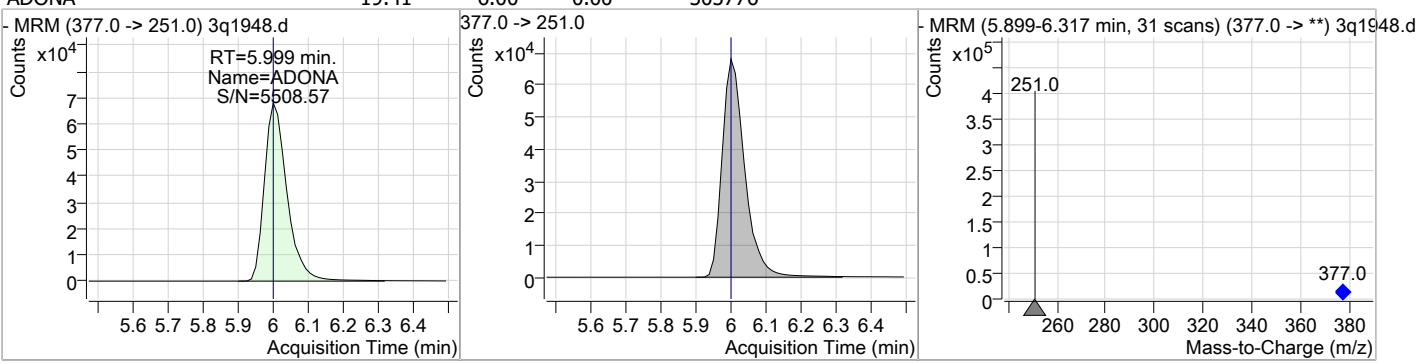


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

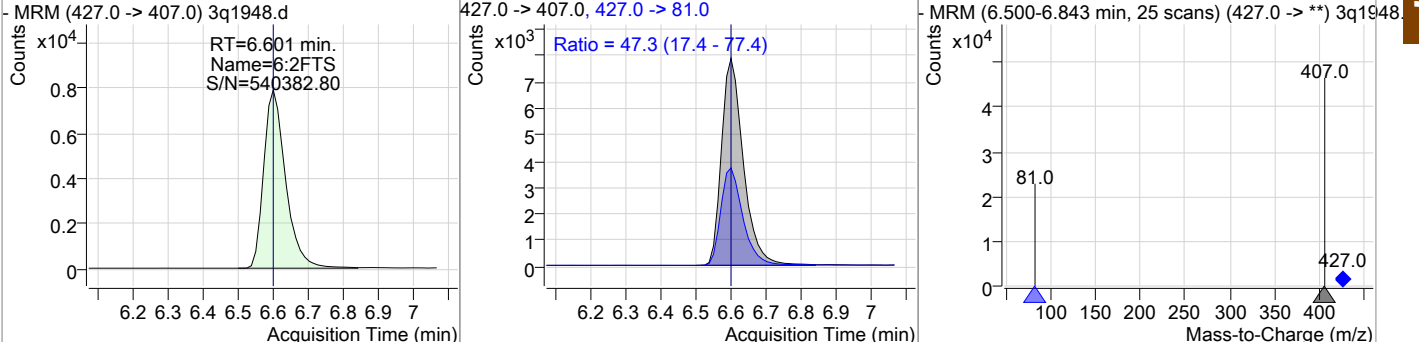


Perfluorinated Compounds by LC/MS/MS

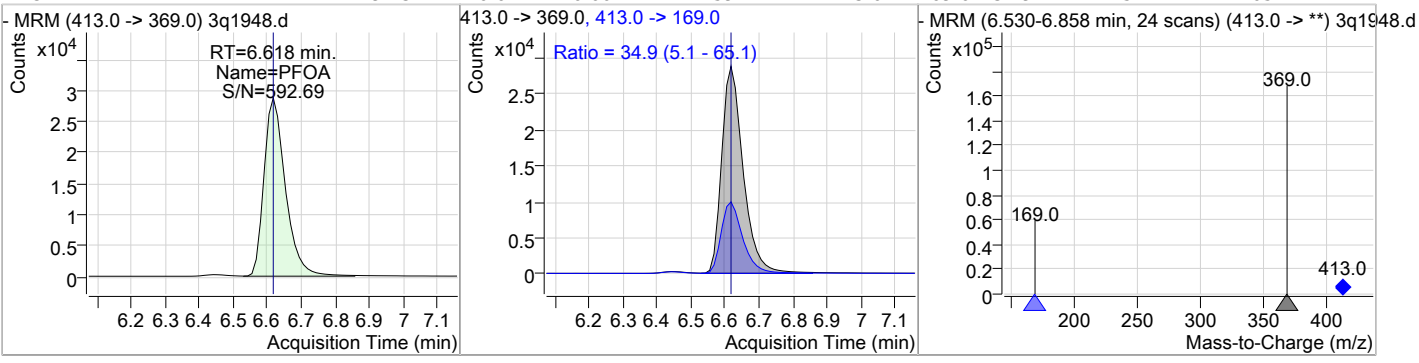
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



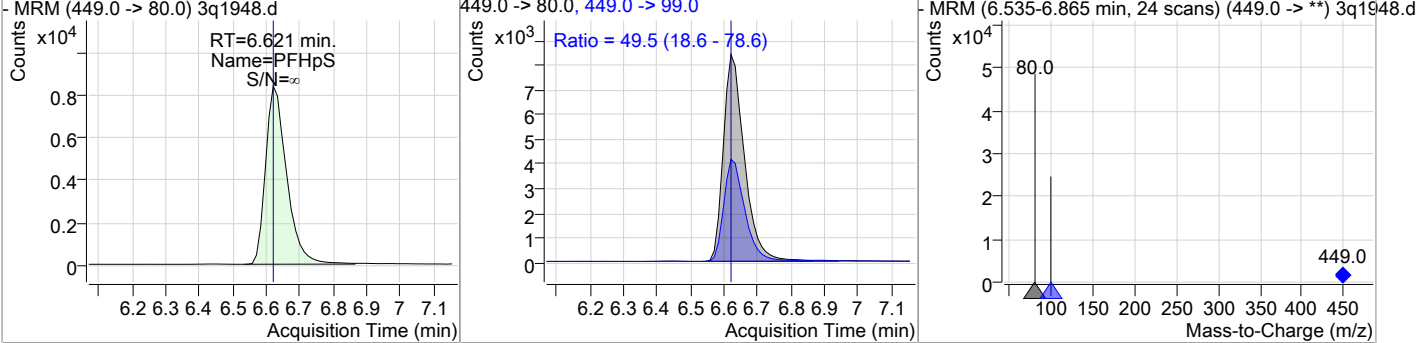
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

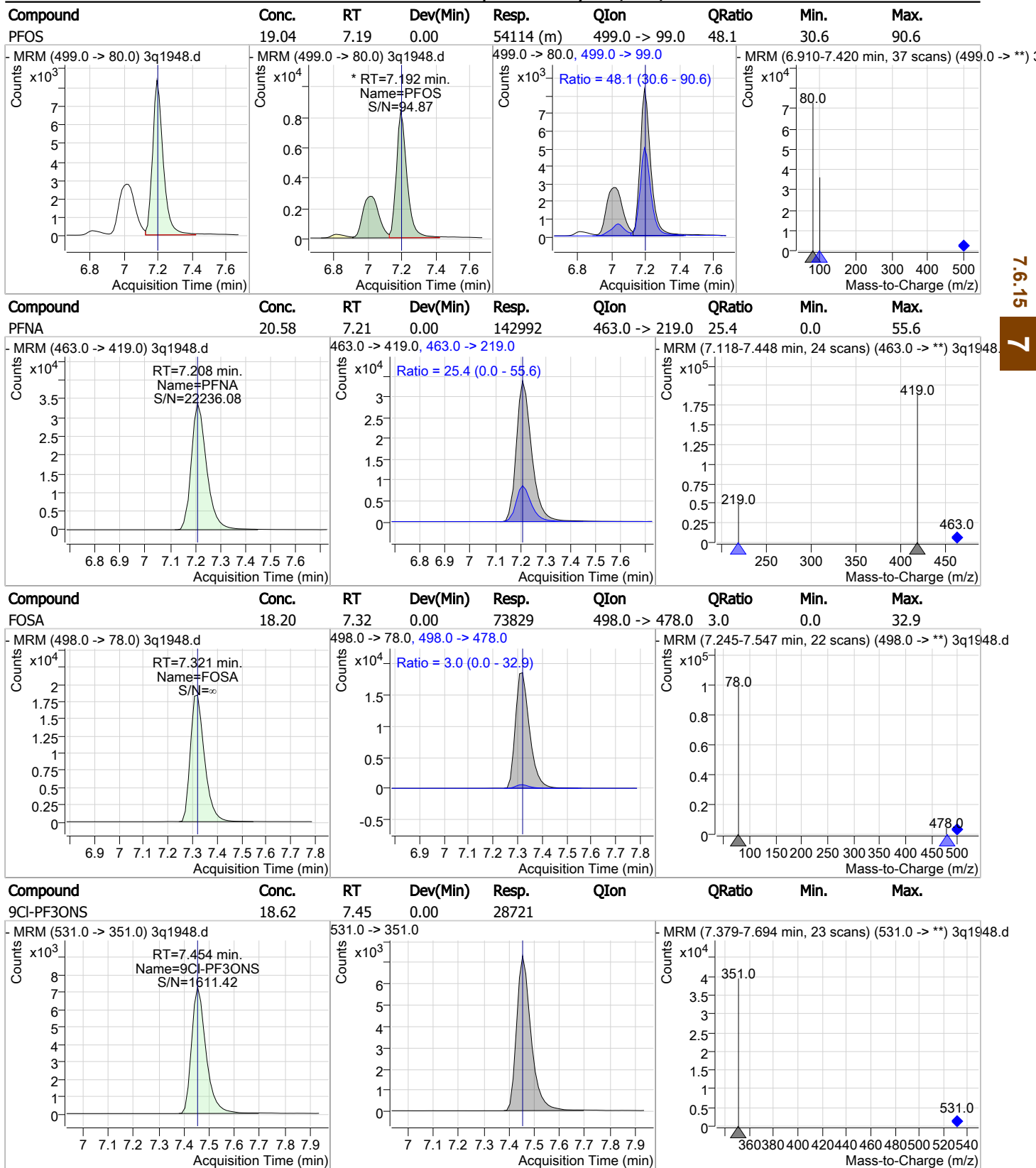


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



7.6.15
7

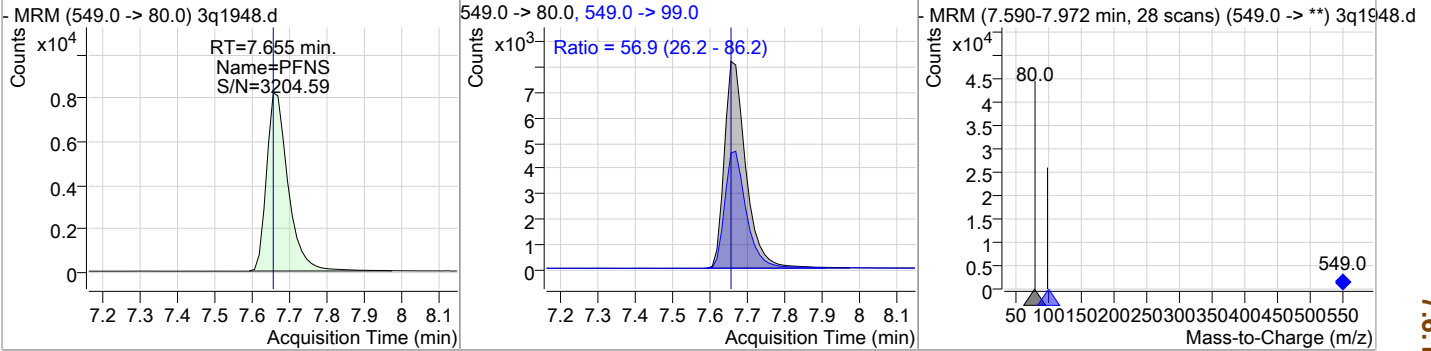
Perfluorinated Compounds by LC/MS/MS



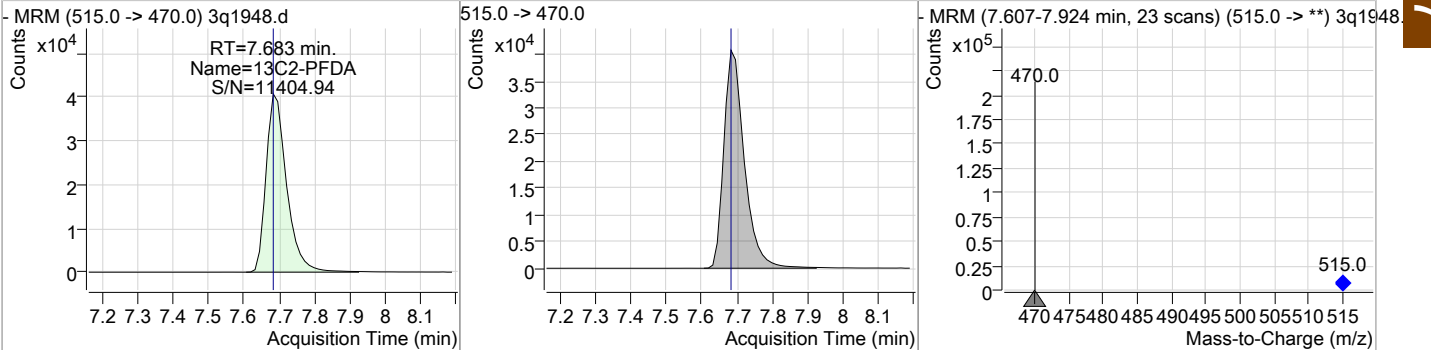
7.6.15
7

Perfluorinated Compounds by LC/MS/MS

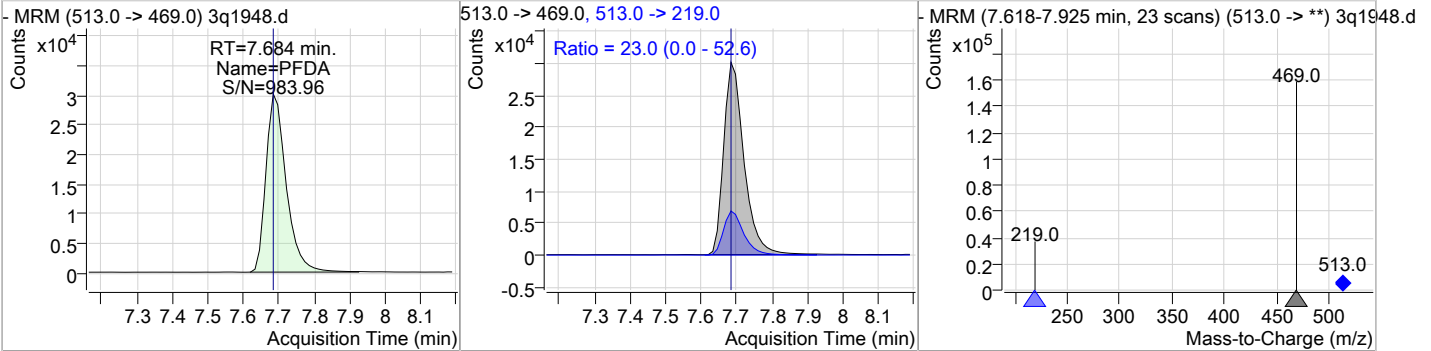
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	20.81	7.65	0.00	32707	549.0 -> 99.0	56.9	26.2	86.2



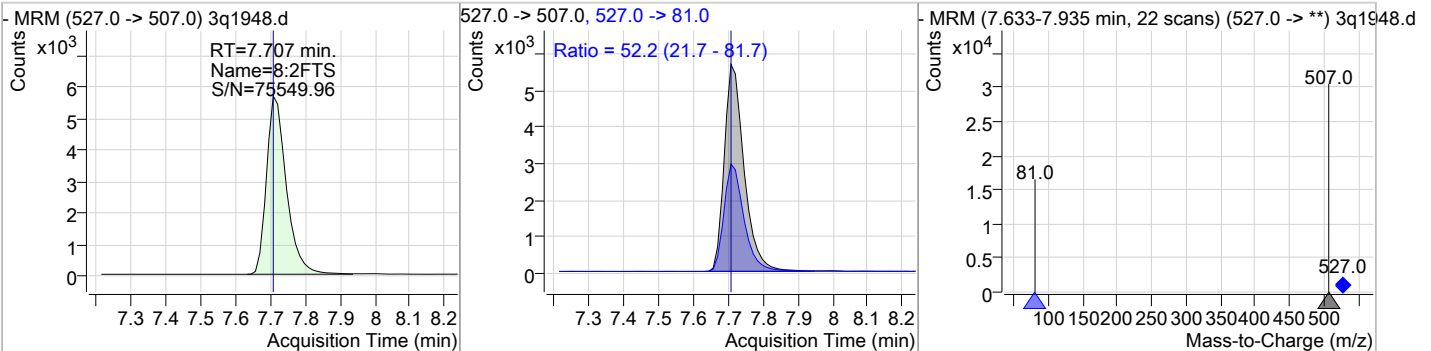
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.92	7.68	0.00	163325				



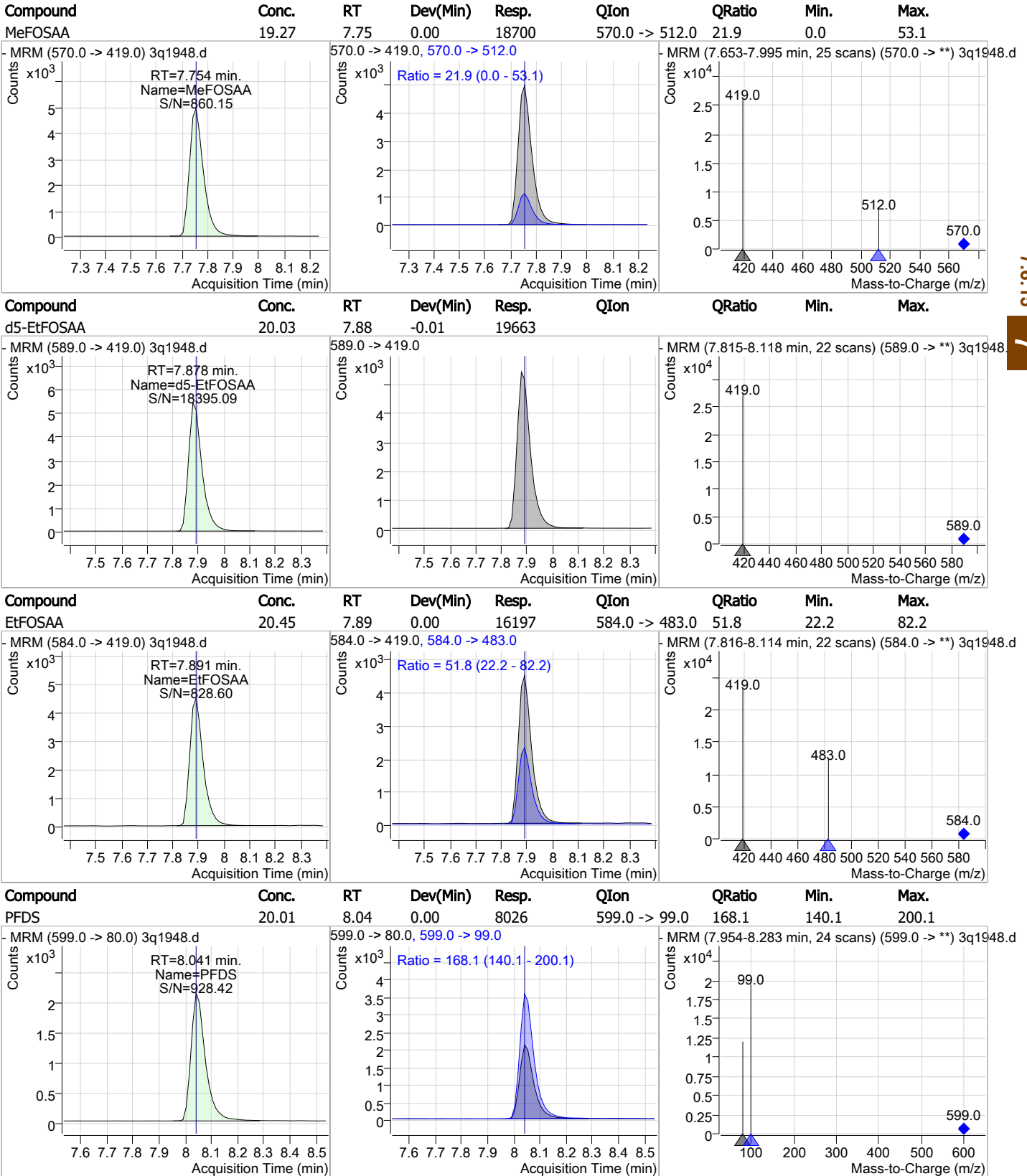
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	21.55	7.68	0.00	119332	513.0 -> 219.0	23.0	0.0	52.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	20.81	7.71	0.00	22441	527.0 -> 81.0	52.2	21.7	81.7



Perfluorinated Compounds by LC/MS/MS

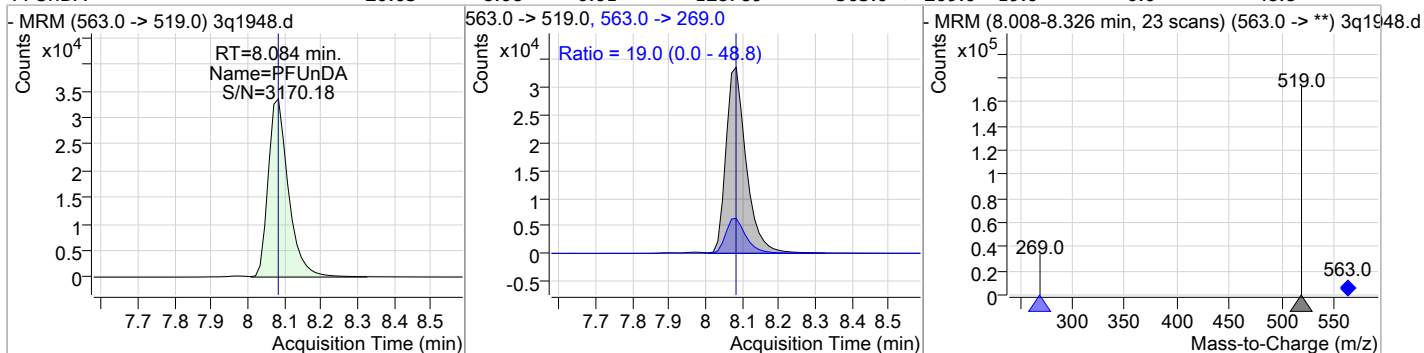


7.6.15 7

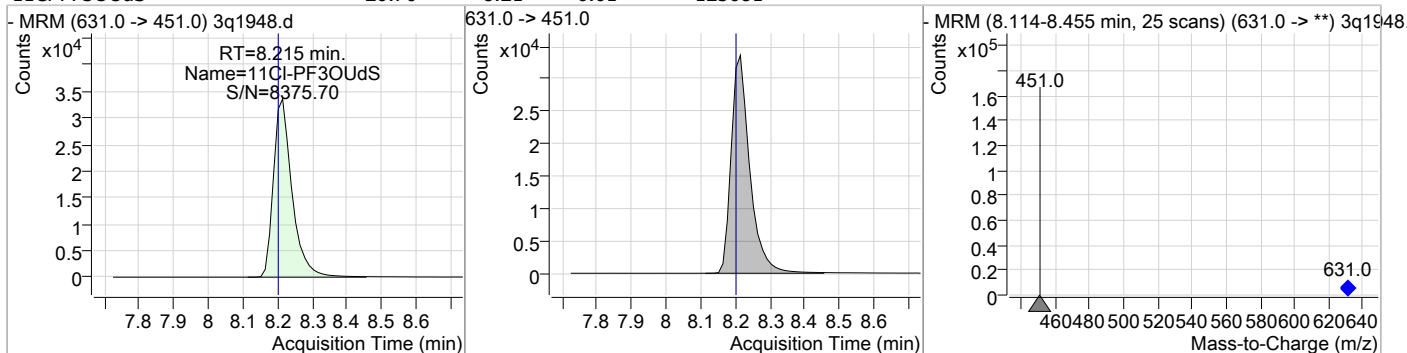


Perfluorinated Compounds by LC/MS/MS

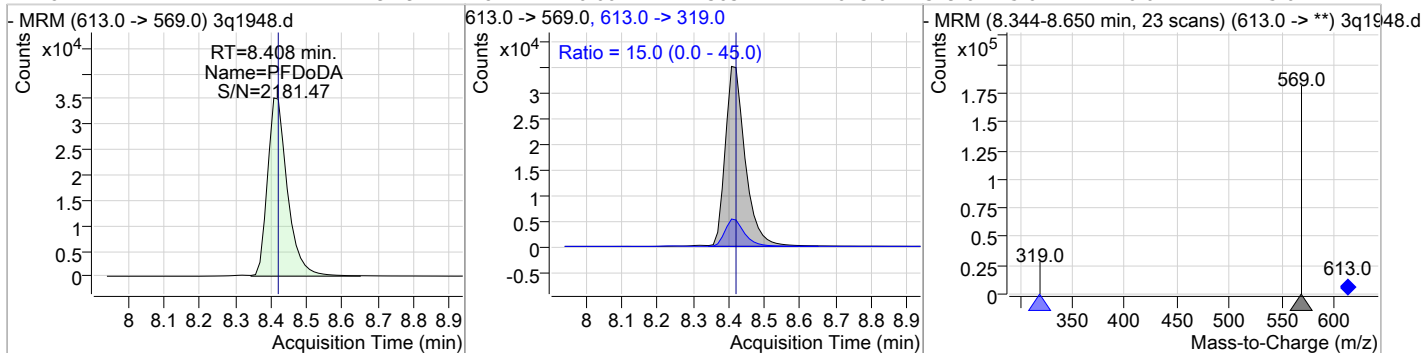
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	20.65	8.08	0.01	128789	563.0 -> 269.0	19.0	0.0	48.8



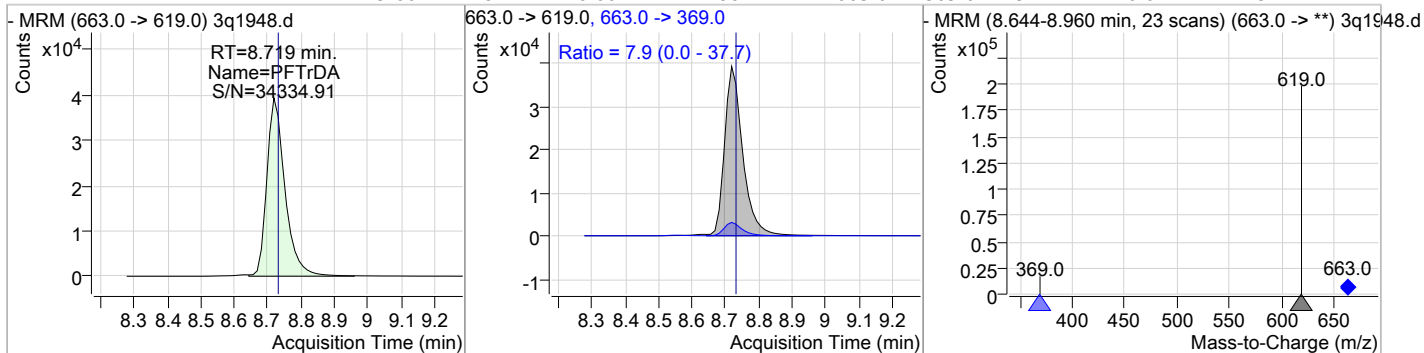
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	20.70	8.21	0.01	125081	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.79	8.41	0.00	136322	613.0 -> 319.0	15.0	0.0	45.0

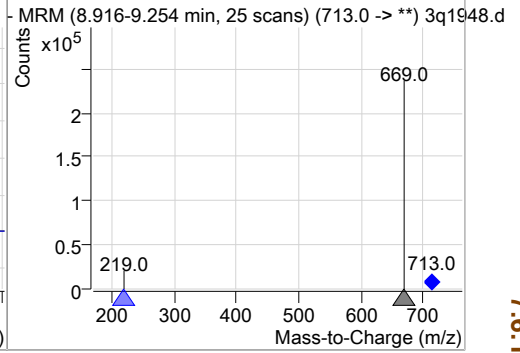
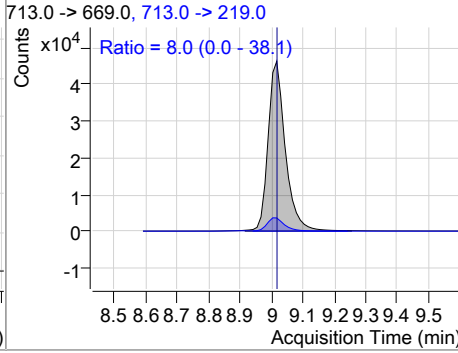
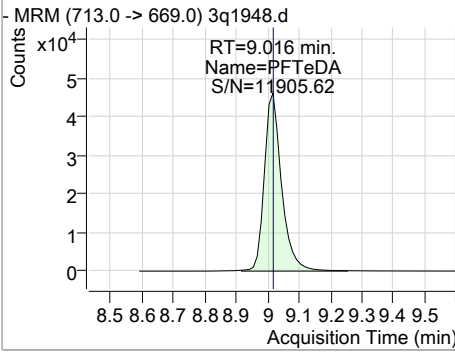


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	19.66	8.72	0.00	148617	663.0 -> 369.0	7.9	0.0	37.7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	19.55	9.02	0.01	175901	713.0 -> 219.0	8.0	0.0	38.1



7.6.15
7

Manual Integration Approval Summary

Sample Number: S3Q53-CC52 **Method:** EPA 537 MOD
Lab FileID: 3Q1948.D **Analyst approved:** 03/18/19 15:18 Nancy Saunders
Injection Time: 03/18/19 14:20 **Supervisor approved:** 03/18/19 16:06 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		5.94	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.19	Split peak

7.6.15.1

7

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	03-15-19
COLUMN TYPE:	Poroshell E1B
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	370

METHODS:	537 <i>umx</i>
ACQ. METHOD:	537 <i>Li + umx</i>
PROC. METHOD:	537 <i>umx 031519 532 52</i>
CALIB. DATE:	03-15-19
RUN BATCH:	S3Q <i>52</i>

ANALYST:	<i>MAS</i>
ELUENT A LOT #:	<i>187166 w/ Acetic Acid</i>
ELUENT B LOT #:	<i>186454 2</i>
ISTD Lot # / amount added:	<i>LC1223</i>
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 1898	A1A1	CCB	PAC							✓
3Q 99	A1	CCB								✓
3Q 1900	A7	LC120-20			LC1223	100/100				Am Lure ESTD ↓
3Q 01	A1	CCB								✓
3Q 02	A2	FC52-0.7			LC1223	2.5/100		SP		✓
3Q 03	A3	-1.0				5/100		SP		✓
3Q 04	A4	-2.0				10/100		SP		✓
3Q 05	A5	-5.0				25/100		SP		✓
3Q 06	A6	-10				50/100		SP		✓
3Q 07	A7	±CC52-20				100/100		SP		✓
3Q 08	A8	FC52-50				25/100		SP		✓
3Q 09	A9	-100				1x		SP		✓
3Q 10	B1	FCV52-20			LC11406	1/100		SP		PDB
3Q 11	B2	-20			A4143	5/100		SP		PDB
3Q 12	B3	-20			LC1204	100/100		SP		PDB
3Q 13	B4	OP74166-B5			OP74166	1x		SP		✓
3Q 14	B5	-ms								BDB
3Q 15	B6	FAG2248-1						SP		✓ Am 5x, 25x ESTD
3Q 16	B7	OP74166-ms						SP		✓ Am 25x 6.2 P
3Q 17	B8	FAG2248-2						SP		✓ Am 2x, 10x 6.2 ESTD P

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	03-17-19
COLUMN TYPE:	Purosill FFB
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	370

METHODS:	537 <i>um X</i>
ACQ. METHOD:	537 <i>List + um X</i>
PROC. METHOD:	537 <i>um X 031514 33652</i>
CALIB. DATE:	03-17-19
RUN BATCH:	S3Q 52

ANALYST:	NAS
ELUENT A LOT #:	107166 w/ <i>Acetic Acid</i>
ELUENT B LOT #:	106454 <i>↓</i>
ISTD Lot # / amount added:	LC1225
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 1918	A134	FA62248-3	PFC	074166	IX					✓ BAL
3Q 19	A7	CC52-20		LC1225	100/T03					PASS
3Q 20	A1	CCB								BAL
3Q 21	C1	FA62248-4		074166	IX			SP		✓ BAL NOTAR
3Q 22	C2	-5								hold
3Q 23	C3	-6								✓ BAL
3Q 24	C4	-7						SP		✓ Am 57.25X 6.17
3Q 25	C5	074166-Rep						SP		✓ Am 2.5X 6.17
3Q 26	A7	CC52-20		LC1225	100/T03			SP		PBX
3Q 27	A1	CCB								BAL
3Q 28	C6	074165-BS		074165	IX			SP		✓
3Q 29	C7	-MB								BAL
3Q 30	C8	FA62248-B						S		✓
3Q 31	C9	074165-M1						SP		✓
3Q 32	D1	-MSD						S		✓
3Q 33	A7	CC52-20		LC1225	100/T03			SP		PASS
3Q 34	A1	CCB								BAL
3Q										
3Q										
3Q										
3Q										
NAS 03-18-19										

Manual Integration Rationale SOP QA029: **MP** Missed Peak, **OP** Overlapping Peak, **SP** Split Peak, **PDB** Poorly Defined Baseline, **PII** Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	03-18-19
COLUMN TYPE:	Porosell E18
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	370

METHODS:	S37 (mxx)
ACQ. METHOD:	S37 List (mxx)
PROC. METHOD:	S37 (mxx) 03/15/19 S3Q53
CALIB. DATE:	03-15-19
RUN BATCH:	S3Q 53

ANALYST:	NAS
ELUENT A LOT #:	187166 with 1/18/19
ELUENT B LOT #:	186954
ISTD Lot # / amount added:	LC1225B
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 195T	P1 A1	CCB	PAL							✓
3Q 36	A1	CCB								✓
3Q 37	A7	AT		LC1223	100/100					✓
3Q 38	A7	CC52-20		L	L			SP		Poss
3Q 39	02	FA62248-1		OP74166	5X			SP		✓
3Q 40	03	-1			25X			SP		✓
3Q 41	04	OP74166-MS			L			SP		✓
3Q 42	05	FA62248-2			2X			SP		✓
3Q 43	06	-2			10X			SP		✓
3Q 44	07	-4			1X			SP		✓
3Q 45	08	-7			5X			SP		✓
3Q 46	09	-7			25X			SP		✓
3Q 47	AP03109 E1	OP74166-MSA			25X			SP		✓
3Q 48	A7	CC52-20		LC1223	100/100			SP		Poss
3Q 49	A1	CCB								CSOL
3Q 50	E2	OP74181-b ₁		OP74181	1X			SP		✓
3Q 51	E3	-mb								BSL
3Q 52	E4	FA62263-1						SP		✓
3Q 53	E5	-2						SP		✓
3Q 54	E6	-3						SP		✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

SPE LIQUID SAMPLE PREP REPORT

Date/Time: 03/14/19 1100
 Started {mm/dd/yy 24:00}

Prep Method: 3535A or 537 or 537MOD (circle)

Date/Time: 03/15/19 1030
 Finished {mm/dd/yy 24:00}

Analytical Method: LC537

Batch#: OP74166 Ext. By: MS Conc. By: MS Viald By: MS

Sample ID	Bottle Number	Amount Extracted (ml)	Initial pH	Adjusted pH	Surrogate Amount	Spike Amount	Final Volume (ml)	Manifold ID	Comments
OP 74166 MB	X	125	6	N/A	20ul		1ml	B	
OP 74166 BS	X	125				20ul			
FA62248-1	1	120							
-2	1	115							
-3	1	125							
-4	1	125							
-5	1	125							
-6	1	125							
-7	1	100							
MS 03/15/19									
FA62248-1MS	2	115	6	N/A	20ul	20ul	1ml	B	
MSD									
FA62248-7DUP	2	115	6	N/A	20ul		1ml	B	

Comments:

Surr.1 ID: LC1179 Conc: 1ppm Exp. Date: 05/13/19 Inj. By: MS Ver. By: MS
 Spk.1 ID: LC1233 Conc: 400ppb Exp. Date: 08/24/19 Inj. By: MS Ver. By: MS
 Spk.2 ID: Conc: Exp. Date: Inj. By: Ver. By:
 Spk.3 ID: Conc: Exp. Date: Inj. By: Ver. By:

TurboVap Temp (Therm ID): TU # 12 N-Evap Temp (Therm ID):
 Observed Temp °C: 45°C Corr. Temp °C: Observed Temp °C: Corr. Temp °C:

Methanol Lot # 186954 SPE Lot # 6429443-09 pH Paper # 212218
 Acetonitrile Lot # Syringe filter Lot # Reagent #
 Water Lot# OP 73908 Pre-filter Lot# Reagent # 2% Methanol 7118050
 Solvent# Carbon Lot# Other MSC 186954

Relinquished By: [Signature] Date: 03/15/19
 Accepted By: [Signature] Date: 03-15-19

ORLD-EXT-0001-3-08-FORM-extwater_spe.xls 032718

7.8.1
7

Sample Summary

Wood Environment & Infrastructure Soln.

Job No: FA62598

Davis Monthan AFB, AZ
Project No: 775303101

Sample Number	Collected		Matrix			Client Sample ID
	Date	Time By	Received	Code	Type	
FA62598-1	03/21/19	09:30 JB	03/22/19	AQ	Equipment Blank	DAVIS-EB-034

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS-EB-034	Date Sampled:	03/21/19
Lab Sample ID:	FA62598-1	Date Received:	03/22/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1 ^a	3Q2178.D	1	03/26/19 10:26	NG	03/25/19 13:30	OP74288	S3Q59
Run #2 ^b	3Q2183.D	1	03/26/19 15:59	NG	03/25/19 13:30	OP74288	S3Q59

	Initial Volume	Final Volume
Run #1	130 ml	1.0 ml
Run #2	130 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
335-67-1	Perfluorooctanoic acid	0.00446	0.015	0.0077	0.0038	ug/l	J
375-95-1	Perfluorononanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
335-76-2	Perfluorodecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
307-55-1	Perfluorododecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.031 U	0.038	0.031	0.015	ug/l	
2991-50-6	EtFOSAA	0.031 U	0.038	0.031	0.015	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.031 U	0.038	0.031	0.015	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.031 U	0.038	0.031	0.015	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	103%	102%	61-134%
	13C2-PFDA	123%	117%	62-128%
	d5-EtFOSAA	131%	116%	57-135%

(a) Insufficient sample for re-extraction.

(b) Confirmation run for internal standard areas.

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

FA62598



Amec Foster Wheeler Environment & Infrastructure
 4600 E. Washington Street, Suite 600
 Phoenix, AZ 85034-1917
 (602) 733-6013

SHIP TO:
 SGS-Accutest
 4405 Vineland Road, Suite C-15
 Orlando, Florida 32811
 Attn: Norm Farmer
 Lab Phone# (407) 425 6700 ext 14924

CHAIN OF CUSTODY

DATE: 3/21/2019
 COC #: DAVIS190321A
 PAGE: 1 OF 1

Project Name: Davis Monthan AFB	Project Contact: Laura Simmonds	Bill To: Amec Foster Wheeler Environment & Infrastructure	Disposal Instructions: LAB
Project Number: 775303101	Phone Number: (605) 671-6774	Address: 3210 Sky Park Court #200	Shipment Method: FEDEX
Project Manager: Sarah Schneider	Project Phase: DMFO01.03001	City/State: San Diego, CA 92123	Waybill Number: N/A

Sample Information							Methods for Analysis												RUSH				
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	EPA 537M													48 Hour	72 Hour	90 Day	TOTAL BOTTLES	HOLD ALL ANALYSES
1	DAVIS-EB-034	03/21/19 09:30	WQ	EB	Z	X																	
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							
11																							
12																							

Sampler's Signature: <i>[Signature]</i>	Date: 3/21/19	Time: 1500	For Lab Use		Comments: X=Analyze H=Hold Analysis Request 5 Day TAT for PFAS Samples sent to SGS
Relinquished By/Affiliation: <i>[Signature]</i>	Date: 3/21/19	Time: 1500	Does COC match samples:	Y or N	
Received By: <i>[Signature]</i>	Date: 3/21/19	Time: 1500	Broken Container:	Y or N	
Relinquished By/Affiliation: <i>[Signature]</i>	Date: 3/21/19	Time: 1600	COC seal intact:	Y or N	
Received By: <i>[Signature]</i>	Date: 3/21/19	Time: 1600	Other problems:	Y or N	NUMBER OF COOLERS SENT:
Relinquished By/Affiliation: <i>[Signature]</i>	Date: 3/21/19	Time: 1600	WSDOT contacted:	Y or N	
Received By: <i>[Signature]</i>	Date: 3/22/19	Time: 9:15	Date contacted:		
Relinquished By/Affiliation: <i>[Signature]</i>	Date: 3/22/19	Time: 9:15	Cooler Temperature at receipt:	2.3 °C	
Received By (LAB): <i>[Signature]</i>	Date: 03/22/19	Time: 9:15	Analyte List: 537 + FTS List		

2.3

Sample Summary

Wood Environment & Infrastructure Soln.

Job No: FA62805

Davis Monthan AFB, AZ
Project No: 775303101

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
FA62805-1	03/24/19	16:00 JB	03/29/19	AQ	Ground Water	DAVIS03-GW-004
FA62805-2	03/25/19	16:45 JB	03/29/19	AQ	Ground Water	DAVIS03-GW-005
FA62805-3	03/26/19	15:00 JB	03/29/19	AQ	Ground Water	DAVIS03-GW-006
FA62805-4	03/24/19	14:55 JB	03/29/19	AQ	Equipment Blank	DAVIS-EB-035
FA62805-5	03/25/19	15:20 JB	03/29/19	AQ	Equipment Blank	DAVIS-EB-036
FA62805-6	03/26/19	13:40 JB	03/29/19	AQ	Equipment Blank	DAVIS-EB-037

Report of Analysis

Client Sample ID:	DAVIS03-GW-004	
Lab Sample ID:	FA62805-1	Date Sampled: 03/24/19
Matrix:	AQ - Ground Water	Date Received: 03/29/19
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids: n/a
Project:	Davis Monthan AFB, AZ	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2533.D	1	04/03/19 18:09	NAF	04/02/19 09:30	OP74423	S3Q66
Run #2	3Q2558.D	2	04/04/19 11:52	NAF	04/02/19 09:30	OP74423	S3Q67

	Initial Volume	Final Volume
Run #1	120 ml	1.0 ml
Run #2	120 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.726	0.017	0.0083	0.0042	ug/l	
375-85-9	Perfluoroheptanoic acid	0.519	0.017	0.0083	0.0042	ug/l	
335-67-1	Perfluorooctanoic acid	0.767	0.017	0.0083	0.0042	ug/l	
375-95-1	Perfluorononanoic acid	0.0287	0.017	0.0083	0.0042	ug/l	B
335-76-2	Perfluorodecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
307-55-1	Perfluorododecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.164	0.017	0.0083	0.0042	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.854 ^a	0.033	0.017	0.0083	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.168	0.017	0.0083	0.0042	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.033 U	0.042	0.033	0.017	ug/l	
2991-50-6	EtFOSAA	0.033 U	0.042	0.033	0.017	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.792 ^a	0.083	0.067	0.033	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.033 U	0.042	0.033	0.017	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	119%	68%	61-134%
	13C2-PFDA	131% ^b	72%	62-128%
	d5-EtFOSAA	69%	39% ^c	57-135%

(a) Result is from Run# 2

(b) Outside control limits. Insufficient sample for re-extraction.

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS03-GW-004	Date Sampled:	03/24/19
Lab Sample ID:	FA62805-1	Date Received:	03/29/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
---------	----------	--------	-----	-----	----	-------	---

(c) Outside control limits due to matrix interference. Confirmed by MS/MSD.

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS03-GW-005	
Lab Sample ID:	FA62805-2	Date Sampled: 03/25/19
Matrix:	AQ - Ground Water	Date Received: 03/29/19
Method:	EPA 537 MOD EPA 537 MOD	Percent Solids: n/a
Project:	Davis Monthan AFB, AZ	

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2535.D	1	04/03/19 18:40	NAF	04/02/19 09:30	OP74423	S3Q66
Run #2	3Q2651.D	1	04/08/19 23:48	NG	04/08/19 07:30	OP74502	S3Q69

	Initial Volume	Final Volume
Run #1	80.0 ml	1.0 ml
Run #2	100 ml	1.0 ml

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0473	0.025	0.013	0.0063	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0171	0.025	0.013	0.0063	ug/l	J
335-67-1	Perfluorooctanoic acid	0.0236	0.025	0.013	0.0063	ug/l	J
375-95-1	Perfluorononanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	
335-76-2	Perfluorodecanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	
307-55-1	Perfluorododecanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.013 U	0.025	0.013	0.0063	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0107	0.025	0.013	0.0063	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0504	0.025	0.013	0.0063	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0121	0.025	0.013	0.0063	ug/l	J

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.040 U ^a	0.050	0.040	0.020	ug/l	
2991-50-6	EtFOSAA	0.040 U ^a	0.050	0.040	0.020	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.0347	0.063	0.050	0.025	ug/l	J
39108-34-4	8:2 Fluorotelomer sulfonate	0.050 U	0.063	0.050	0.025	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	108%	131%	61-134%
	13C2-PFDA	95%	136% ^b	62-128%
	d5-EtFOSAA	45% ^b	115%	57-135%

(a) Result is from Run# 2

(b) Outside control limits.

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS03-GW-006		Date Sampled:	03/26/19
Lab Sample ID:	FA62805-3	Date Received:	03/29/19	
Matrix:	AQ - Ground Water		Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD			
Project:	Davis Monthan AFB, AZ			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2652.D	1	04/09/19 00:04	NG	04/08/19 07:30	OP74502	S3Q69
Run #2							

	Initial Volume	Final Volume
Run #1	120 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0179	0.017	0.0083	0.0042	ug/l	
375-85-9	Perfluoroheptanoic acid	0.00540	0.017	0.0083	0.0042	ug/l	J
335-67-1	Perfluorooctanoic acid	0.00950	0.017	0.0083	0.0042	ug/l	J
375-95-1	Perfluorononanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
335-76-2	Perfluorodecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
307-55-1	Perfluorododecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0083 U	0.017	0.0083	0.0042	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.00500	0.017	0.0083	0.0042	ug/l	J
355-46-4	Perfluorohexanesulfonic acid	0.0221	0.017	0.0083	0.0042	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0239	0.017	0.0083	0.0042	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.033 U	0.042	0.033	0.017	ug/l	
2991-50-6	EtFOSAA	0.033 U	0.042	0.033	0.017	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.033 U	0.042	0.033	0.017	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.033 U	0.042	0.033	0.017	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	101%		61-134%
	13C2-PFDA	113%		62-128%
	d5-EtFOSAA	92%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS-EB-035	Date Sampled:	03/24/19
Lab Sample ID:	FA62805-4	Date Received:	03/29/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2537.D	1	04/03/19 19:10	NAF	04/02/19 09:30	OP74423	S3Q66
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	115%		61-134%
	13C2-PFDA	117%		62-128%
	d5-EtFOSAA	117%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS-EB-036	Date Sampled:	03/25/19
Lab Sample ID:	FA62805-5	Date Received:	03/29/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2564.D	1	04/04/19 13:24	NAF	04/02/19 09:30	OP74423	S3Q67
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	107%		61-134%
	13C2-PFDA	111%		62-128%
	d5-EtFOSAA	99%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	DAVIS-EB-037		Date Sampled:	03/26/19
Lab Sample ID:	FA62805-6	Date Received:	03/29/19	
Matrix:	AQ - Equipment Blank		Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD			
Project:	Davis Monthan AFB, AZ			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2565.D	1	04/04/19 14:01	NAF	04/02/19 09:30	OP74423	S3Q67
Run #2							

	Initial Volume	Final Volume
Run #1	130 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
335-67-1	Perfluorooctanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
375-95-1	Perfluorononanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
335-76-2	Perfluorodecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
307-55-1	Perfluorododecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0077 U	0.015	0.0077	0.0038	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.031 U	0.038	0.031	0.015	ug/l	
2991-50-6	EtFOSAA	0.031 U	0.038	0.031	0.015	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.031 U	0.038	0.031	0.015	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.031 U	0.038	0.031	0.015	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	103%		61-134%
	13C2-PFDA	107%		62-128%
	d5-EtFOSAA	96%		57-135%

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Job Change Order: FA62805

Requested Date:	4/3/2019	Received Date:	3/29/2019
Account Name:	Wood Environment & Infrastructur	Due Date:	4/5/2019
Project Description:	Davis Monthan AFB, AZ	Deliverable:	FULT1
CSR:	AC	TAT (Days):	5

=====
Sample #: FA62805-all **Change:**
Dept: Please split samples -7&-8 into a separate report.
TAT: 5
=====

FA62805: Chain of Custody

Page 3 of 3

Above Changes Per: Laura Simmons

Date/Time: 4/3/2019 4:44:38 PM

To Client: This Change Order is confirmation of the revisions, previously discussed with the Client Service Representative.

Page 1 of 1

The results set forth herein are provided by SGS North America Inc.

e-Hardcopy 2.0
Automated Report

Technical Report for

Wood Environment & Infrastructure Soln.

Davis Monthan AFB, AZ

775303101

SGS Job Number: FA63114

Sampling Dates: 04/05/19 - 04/06/19



Report to:

Wood Environment & Infrastructure Soln.
7376 SW Durham Rd
Portland, OR 97224
marie.bevier@amecfw.com; hope.mariska@woodplc.com;
samantha.sargent@woodplc.com; sarah.schneider@woodplc.com
ATTN: Marie Bevier

Total number of pages in report: **231**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.

Caitlin Brice, M.S.
General Manager

Client Service contact: Andrea Colby 407-425-6700

Certifications: FL(E83510), LA(03051), KS(E-10327), IL(200063), NC(573), NJ(FL002), NY(12022), SC(96038001)
DoD ELAP(ANAB L2229), AZ(AZ0806), CA(2937), TX(T104704404), PA(68-03573), VA(460177),
AK, AR, IA, KY, MA, MS, ND, NH, NV, OK, OR, UT, WA, WV

This report shall not be reproduced, except in its entirety, without the written approval of SGS.

Test results relate only to samples analyzed.

Table of Contents

-1-

Section 1: Sample Summary	3
Section 2: Case Narrative/Conformance Summary	4
Section 3: Summary of Hits	6
Section 4: Sample Results	7
4.1: FA63114-1: DAVIS03-GW-007	8
4.2: FA63114-2: DAVIS03-GW-008	9
4.3: FA63114-3: DAVIS-EB-038	10
4.4: FA63114-4: DAVIS-EB-039	11
Section 5: Misc. Forms	12
5.1: Chain of Custody	13
5.2: QC Evaluation: DOD QSM5 Limits	15
Section 6: MS Semi-volatiles - QC Data Summaries	16
6.1: Method Blank Summary	17
6.2: Blank Spike Summary	18
6.3: Matrix Spike Summary	19
6.4: Duplicate Summary	20
6.5: Internal Standard Area Summaries	21
6.6: Surrogate Recovery Summaries	22
6.7: Initial and Continuing Calibration Summaries	23
Section 7: MS Semi-volatiles - Raw Data	36
7.1: Samples	37
7.2: Method Blanks	55
7.3: Blank Spikes	59
7.4: Matrix Spikes	69
7.5: Duplicates	79
7.6: Initial and Continuing Calibrations	83
7.7: Instrument Run Logs	225
7.8: Prep Logs	231



Sample Summary

Wood Environment & Infrastructure Soln.

Job No: FA63114

Davis Monthan AFB, AZ
 Project No: 775303101

Sample Number	Collected		Received	Matrix		Client Sample ID
	Date	Time By		Code	Type	
FA63114-1	04/05/19	17:25 FD	04/09/19	AQ	Ground Water	DAVIS03-GW-007
FA63114-2	04/06/19	11:55 FD	04/09/19	AQ	Ground Water	DAVIS03-GW-008
FA63114-3	04/05/19	09:20 FD	04/09/19	AQ	Equipment Blank	DAVIS-EB-038
FA63114-4	04/06/19	08:30 FD	04/09/19	AQ	Equipment Blank	DAVIS-EB-039

SAMPLE DELIVERY GROUP CASE NARRATIVE

Client: Wood Environment & Infrastructure Soln.

Job No: FA63114

Site: Davis Monthan AFB, AZ

Report Date 4/17/2019 1:15:49

4 Samples were collected between 04/05/2019 and 04/06/2019 and were received at SGS North America Inc - Orlando on 04/09/2019 properly preserved, at 3.4 Deg. C and intact. These Samples received an SGS Orlando job number of FA63114. A listing of the Laboratory Sample ID, Client Sample ID and dates of collection are presented in the Results Summary Section. Except as noted below, all method specified calibrations and quality control performance criteria were met for this job. For more information, please refer to QC summary pages.

MS Semi-volatiles By Method EPA 537 MOD

Matrix: AQ

Batch ID: OP74558

All samples were extracted within the recommended method holding time.

All samples were analyzed within the recommended method holding time.

Sample(s) FA63114-1MS, FA63114-2DUP were used as the QC samples indicated.

All method blanks for this batch meet method specific criteria.

SGS Orlando certifies that this report meets the project requirements for analytical data produced for the samples as received at SGS Orlando and as stated on the COC. SGS Orlando certifies that the data meets the Data Quality Objectives for precision, accuracy and completeness as specified in the SGS Orlando Quality Manual except as noted above. This report is to be used in its entirety. SGS Orlando is not responsible for any assumptions of data quality if partial data packages are used.

Narrative prepared by:

Ariel Hartney, Client Services (*Signature on File*)

Manual Integration Summary

Lab Sample ID	Analysis Type	File ID	Manual Integrations
FA63114-2	MSSEMI	3Q2902.D	Perfluorooctanesulfonic acid
FA63114-3	MSSEMI	3Q2904.D	Perfluorooctanesulfonic acid
OP74558-BS	MSSEMI	3Q2898.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
OP74558-MS	MSSEMI	3Q2901.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-CC72	MSSEMI	3Q2896.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2810.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2811.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2812.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2813.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2814.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2816.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-IC72	MSSEMI	3Q2817.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-ICC72	MSSEMI	3Q2815.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-ICV72	MSSEMI	3Q2818.D	EtFOSAA, MeFOSAA, Perfluorooctanesulfonic acid, Perfluorooctanoic acid
S3Q72-ICV72	MSSEMI	3Q2819.D	Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid
S3Q72-ICV72	MSSEMI	3Q2820.D	EtFOSAA, MeFOSAA, Perfluorohexanesulfonic acid, Perfluorooctanesulfonic acid

Summary of Hits

Job Number: FA63114
Account: Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ
Collected: 04/05/19 thru 04/06/19



Lab Sample ID	Client Sample ID	Result/ Qual	LOQ	LOD	Units	Method
---------------	------------------	-----------------	-----	-----	-------	--------

FA63114-1 **DAVIS03-GW-007**

No hits reported in this sample.

FA63114-2 **DAVIS03-GW-008**

No hits reported in this sample.

FA63114-3 **DAVIS-EB-038**

Perfluorooctanesulfonic acid	0.00604 J	0.016	0.0080	ug/l	EPA 537 MOD
------------------------------	-----------	-------	--------	------	-------------

FA63114-4 **DAVIS-EB-039**

No hits reported in this sample.

Sample Results

Report of Analysis

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS03-GW-007	Date Sampled:	04/05/19
Lab Sample ID:	FA63114-1	Date Received:	04/09/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2900.D	1	04/12/19 14:05	NAF	04/11/19 08:25	OP74558	S3Q72
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	102%		61-134%
	13C2-PFDA	102%		62-128%
	d5-EtFOSAA	92%		57-135%

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS03-GW-008	Date Sampled:	04/06/19
Lab Sample ID:	FA63114-2	Date Received:	04/09/19
Matrix:	AQ - Ground Water	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2902.D	1	04/12/19 14:36	NAF	04/11/19 08:25	OP74558	S3Q72
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	95%		61-134%
	13C2-PFDA	92%		62-128%
	d5-EtFOSAA	87%		57-135%

U = Not detected

LOD = Limit of Detection

J = Indicates an estimated value

LOQ = Limit of Quantitation

DL = Detection Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS-EB-038		Date Sampled:	04/05/19
Lab Sample ID:	FA63114-3		Date Received:	04/09/19
Matrix:	AQ - Equipment Blank		Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD			
Project:	Davis Monthan AFB, AZ			

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2904.D	1	04/12/19 15:07	NAF	04/11/19 08:25	OP74558	S3Q72
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.00604	0.016	0.0080	0.0040	ug/l	J

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	106%		61-134%
	13C2-PFDA	120%		62-128%
	d5-EtFOSAA	118%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

SGS North America Inc.

Report of Analysis

Page 1 of 1

Client Sample ID:	DAVIS-EB-039	Date Sampled:	04/06/19
Lab Sample ID:	FA63114-4	Date Received:	04/09/19
Matrix:	AQ - Equipment Blank	Percent Solids:	n/a
Method:	EPA 537 MOD EPA 537 MOD		
Project:	Davis Monthan AFB, AZ		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	3Q2905.D	1	04/12/19 15:22	NAF	04/11/19 08:25	OP74558	S3Q72
Run #2							

	Initial Volume	Final Volume
Run #1	125 ml	1.0 ml
Run #2		

Perfluorinated Alkyl Acids

CAS No.	Compound	Result	LOQ	LOD	DL	Units	Q
PERFLUOROALKYLCARBOXYLIC ACIDS							
307-24-4	Perfluorohexanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROALKYLSULFONATES

375-73-5	Perfluorobutanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	0.0080 U	0.016	0.0080	0.0040	ug/l	

PERFLUOROOCCTANESULFONAMIDOACETIC ACIDS

2355-31-9	MeFOSAA	0.032 U	0.040	0.032	0.016	ug/l	
2991-50-6	EtFOSAA	0.032 U	0.040	0.032	0.016	ug/l	

FLUOROTELOMER SULFONATES

27619-97-2	6:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	0.032 U	0.040	0.032	0.016	ug/l	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
	13C2-PFHxA	106%		61-134%
	13C2-PFDA	118%		62-128%
	d5-EtFOSAA	64%		57-135%

U = Not detected LOD = Limit of Detection
 LOQ = Limit of Quantitation DL = Detection Limit
 E = Indicates value exceeds calibration range

J = Indicates an estimated value
 B = Indicates analyte found in associated method blank
 N = Indicates presumptive evidence of a compound

Misc. Forms

Custody Documents and Other Forms

Includes the following where applicable:

- Chain of Custody
- QC Evaluation: DOD QSM5 Limits

FA63114



Amec Foster Wheeler Environment & Infrastructure
 4600 E. Washington Street, Suite 600
 Phoenix, AZ 85034-1917
 (602) 733-6013

SHIP TO:
 SGS-Accutest
 4406 Vineland Road, Suite C-15
 Orlando, Florida 32811
 Attn: Norm Farmer
 Lab Phone# (407) 425 6700 ext 14924

CHAIN OF CUSTODY

DATE: 4/5/2019

COC #: DAVIS190405A

PAGE: 1 OF 1

Project Name: Davis Monthan AFB	Project Contact: Laura Simmons	Bill To: Amec Foster Wheeler Environment & Infrastructure	Disposal Instructions: LAB
Project Number: 775303101	Phone Number: (866) 671-6774	9210 Sky Park Court #200	Shipment Method: FEDEX
Project Manager: Sarah Schneider	Project Phase: DMF001.0300	San Diego, CA 92123	Waybill Number: N/A

Sample Information						Methods for Analysis						RUSH						
No.	Sample ID	Date & Time Sampled	Matrix	Sample Type	MS/MSD	EPA 537M							24 Hour	48 Hour	72 Hour	5 Days	TOTAL BOTTLES	HOLD All Analyses
1	DAVIS03-GW-007	04/05/19 17:25	WG	N	N	X											2	
2	DAVIS03-GW-008	04/06/19 11:55	WG	N	N	X											2	
3	DAVIS03-EB-038	04/05/19 09:20	WQ	N	N	X											2	
4	DAVIS03-EB-039	04/06/19 08:30	WQ	N	N	X											2	
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		

Sample's Signature: Relinquished By/Affiliation: Received By: FedEx Relinquished By/Affiliation: Fed Ex Received By: Relinquished By/Affiliation: Received By (LAB): 	Date: 4/9/19 Time: 1550 Date: 4/8/19 Time: 1550 Date: 4/8/19 Time: 1550 Date: 4/8/19 Time: 1550 Date: Time: Date: Time: Date: Time: 04/09/19 Time: 915	For Lab Use Does COC match samples: Y or N Broken Container: Y or N COC seal intact: Y or N Other problems: Y or N WSDOT contacted: Y or N Date contacted: Cooler Temperature at receipt: 3.4 Analyte List: 537 + FTS List	Comments: X=Analyze H=Hold Analysis Request 5 Day TAT for PFAS Samples sent to SGS NUMBER OF COOLERS SENT:
---	---	--	--

51
5

FA63114: Chain of Custody

Page 1 of 2



SGS Sample Receipt Summary

Job Number: FA63114

Client: AMEC FOSTER WHEELER

Project: DAVIS MONTHAN AFB

Date / Time Received: 4/9/2019 9:15:00 AM

Delivery Method: FED EX

Airbill #'s: 1001891731210003281100786525718378

Therm ID: IR 1;

Therm CF: 0.4;

of Coolers: 1

Cooler Temps (Raw Measured) °C: Cooler 1: (3.0);

Cooler Temps (Corrected) °C: Cooler 1: (3.4);

Cooler Information

	<u>Y</u>	<u>or</u>	<u>N</u>
1. Custody Seals Present	<input checked="" type="checkbox"/>		<input type="checkbox"/>
2. Custody Seals Intact	<input checked="" type="checkbox"/>		<input type="checkbox"/>
3. Temp criteria achieved	<input checked="" type="checkbox"/>		<input type="checkbox"/>
4. Cooler temp verification	<u>IR Gun</u>		
5. Cooler media	<u>Ice (Bag)</u>		

Sample Information

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Sample labels present on bottles	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
2. Samples preserved properly	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
3. Sufficient volume/containers recvd for analysis:	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
4. Condition of sample	<u>Intact</u>			
5. Sample recvd within HT	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
6. Dates/Times/IDs on COC match Sample Label	<input checked="" type="checkbox"/>		<input type="checkbox"/>	
7. VOCs have headspace	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
8. Bottles received for unspecified tests	<input type="checkbox"/>		<input checked="" type="checkbox"/>	
9. Compositing instructions clear	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
10. Voa Soil Kits/Jars received past 48hrs?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
11. % Solids Jar received?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
12. Residual Chlorine Present?	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Trip Blank Information

	<u>Y</u>	<u>or</u>	<u>N</u>	<u>N/A</u>
1. Trip Blank present / cooler	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
2. Trip Blank listed on COC	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>
	<u>W</u>	<u>or</u>	<u>S</u>	<u>N/A</u>
3. Type Of TB Received	<input type="checkbox"/>		<input type="checkbox"/>	<input checked="" type="checkbox"/>

Misc. Information

Number of Encores: 25-Gram _____ 5-Gram _____

Test Strip Lot #: pH 0-3 230315

Residual Chlorine Test Strip Lot #: _____

Number of 5035 Field Kits: _____

pH 10-12 219813A

Number of Lab Filtered Metals: _____

Other: (Specify) _____

Comments

SM001
Rev. Date 05/24/17

Technician: SHAYLAP

Date: 4/9/2019 9:15:00 AM

Reviewer: _____

Date: _____

FA63114: Chain of Custody

Page 2 of 2

5.1
5

QC Evaluation: DOD QSM5 Limits

Job Number: FA63114
Account: Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ
Collected: 04/05/19 thru 04/06/19

QC Sample ID	CAS#	Analyte	Sample Result Type	Result Type	Units	Limits
--------------	------	---------	--------------------	-------------	-------	--------

No Exceptions found.

* Sample used for QC is not from job FA63114

5.2
5

MS Semi-volatiles

QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Blank Spike Summaries
- Matrix Spike and Duplicate Summaries
- Internal Standard Area Summaries
- Surrogate Recovery Summaries
- Initial and Continuing Calibration Summaries

Method Blank Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74558-MB	3Q2899.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA63114-1, FA63114-2, FA63114-3, FA63114-4

CAS No.	Compound	Result	RL	MDL	Units	Q
307-24-4	Perfluorohexanoic acid	ND	0.016	0.0040	ug/l	
375-85-9	Perfluoroheptanoic acid	ND	0.016	0.0040	ug/l	
335-67-1	Perfluorooctanoic acid	ND	0.016	0.0040	ug/l	
375-95-1	Perfluorononanoic acid	ND	0.016	0.0040	ug/l	
335-76-2	Perfluorodecanoic acid	ND	0.016	0.0040	ug/l	
2058-94-8	Perfluoroundecanoic acid	ND	0.016	0.0040	ug/l	
307-55-1	Perfluorododecanoic acid	ND	0.016	0.0040	ug/l	
72629-94-8	Perfluorotridecanoic acid	ND	0.016	0.0040	ug/l	
376-06-7	Perfluorotetradecanoic acid	ND	0.016	0.0040	ug/l	
375-73-5	Perfluorobutanesulfonic acid	ND	0.016	0.0040	ug/l	
355-46-4	Perfluorohexanesulfonic acid	ND	0.016	0.0040	ug/l	
1763-23-1	Perfluorooctanesulfonic acid	ND	0.016	0.0040	ug/l	
2355-31-9	MeFOSAA	ND	0.040	0.016	ug/l	
2991-50-6	EtFOSAA	ND	0.040	0.016	ug/l	
27619-97-2	6:2 Fluorotelomer sulfonate	ND	0.040	0.016	ug/l	
39108-34-4	8:2 Fluorotelomer sulfonate	ND	0.040	0.016	ug/l	

CAS No.	Surrogate Recoveries	Limits	
	13C2-PFHxA	107%	61-134%
	13C2-PFDA	93%	62-128%
	d5-EtFOSAA	98%	57-135%

Blank Spike Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74558-BS	3Q2898.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA63114-1, FA63114-2, FA63114-3, FA63114-4

CAS No.	Compound	Spike ug/l	BSP ug/l	BSP %	Limits
307-24-4	Perfluorohexanoic acid	0.16	0.148	93	63-146
375-85-9	Perfluoroheptanoic acid	0.16	0.150	94	71-138
335-67-1	Perfluorooctanoic acid	0.16	0.162	101	74-137
375-95-1	Perfluorononanoic acid	0.16	0.143	89	76-140
335-76-2	Perfluorodecanoic acid	0.16	0.137	86	65-148
2058-94-8	Perfluoroundecanoic acid	0.16	0.141	88	57-138
307-55-1	Perfluorododecanoic acid	0.16	0.137	86	58-118
72629-94-8	Perfluorotridecanoic acid	0.16	0.136	85	52-120
376-06-7	Perfluorotetradecanoic acid	0.16	0.137	86	49-122
375-73-5	Perfluorobutanesulfonic acid	0.16	0.153	96	73-148
355-46-4	Perfluorohexanesulfonic acid	0.16	0.152	95	74-142
1763-23-1	Perfluorooctanesulfonic acid	0.16	0.137	86	70-134
2355-31-9	MeFOSAA	0.16	0.132	83	57-128
2991-50-6	EtFOSAA	0.16	0.137	86	55-135
27619-97-2	6:2 Fluorotelomer sulfonate	0.16	0.165	103	70-153
39108-34-4	8:2 Fluorotelomer sulfonate	0.16	0.121	76	61-154

CAS No.	Surrogate Recoveries	BSP	Limits
	13C2-PFHxA	110%	61-134%
	13C2-PFDA	96%	62-128%
	d5-EtFOSAA	90%	57-135%

* = Outside of Control Limits.

Matrix Spike Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74558-MS	3Q2901.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72
FA63114-1	3Q2900.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA63114-1, FA63114-2, FA63114-3, FA63114-4

CAS No.	Compound	FA63114-1 ug/l	Spike Q	ug/l	MS ug/l	MS %	Limits
307-24-4	Perfluorohexanoic acid	0.016 U	0.16	0.152	95	63-146	
375-85-9	Perfluoroheptanoic acid	0.016 U	0.16	0.157	98	71-138	
335-67-1	Perfluorooctanoic acid	0.016 U	0.16	0.170	106	74-137	
375-95-1	Perfluorononanoic acid	0.016 U	0.16	0.171	107	76-140	
335-76-2	Perfluorodecanoic acid	0.016 U	0.16	0.161	101	65-148	
2058-94-8	Perfluoroundecanoic acid	0.016 U	0.16	0.161	101	57-138	
307-55-1	Perfluorododecanoic acid	0.016 U	0.16	0.150	94	58-118	
72629-94-8	Perfluorotridecanoic acid	0.016 U	0.16	0.140	88	52-120	
376-06-7	Perfluorotetradecanoic acid	0.016 U	0.16	0.131	82	49-122	
375-73-5	Perfluorobutanesulfonic acid	0.016 U	0.16	0.155	97	73-148	
355-46-4	Perfluorohexanesulfonic acid	0.016 U	0.16	0.160	100	74-142	
1763-23-1	Perfluorooctanesulfonic acid	0.016 U	0.16	0.156	98	70-134	
2355-31-9	MeFOSAA	0.040 U	0.16	0.151	94	57-128	
2991-50-6	EtFOSAA	0.040 U	0.16	0.153	96	55-135	
27619-97-2	6:2 Fluorotelomer sulfonate	0.040 U	0.16	0.172	108	70-153	
39108-34-4	8:2 Fluorotelomer sulfonate	0.040 U	0.16	0.144	90	61-154	

CAS No.	Surrogate Recoveries	MS	FA63114-1	Limits
	13C2-PFHxA	108%	102%	61-134%
	13C2-PFDA	108%	102%	62-128%
	d5-EtFOSAA	96%	92%	57-135%

* = Outside of Control Limits.

Duplicate Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP74558-DUP	3Q2903.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72
FA63114-2	3Q2902.D	1	04/12/19	NAF	04/11/19	OP74558	S3Q72

The QC reported here applies to the following samples:

Method: EPA 537 MOD

FA63114-1, FA63114-2, FA63114-3, FA63114-4

CAS No.	Compound	FA63114-2 ug/l	DUP Q	ug/l	Q	RPD	Limits
307-24-4	Perfluorohexanoic acid	0.016 U	ND		nc		30
375-85-9	Perfluoroheptanoic acid	0.016 U	ND		nc		30
335-67-1	Perfluorooctanoic acid	0.016 U	ND		nc		30
375-95-1	Perfluorononanoic acid	0.016 U	ND		nc		30
335-76-2	Perfluorodecanoic acid	0.016 U	ND		nc		30
2058-94-8	Perfluoroundecanoic acid	0.016 U	ND		nc		30
307-55-1	Perfluorododecanoic acid	0.016 U	ND		nc		30
72629-94-8	Perfluorotridecanoic acid	0.016 U	ND		nc		30
376-06-7	Perfluorotetradecanoic acid	0.016 U	ND		nc		30
375-73-5	Perfluorobutanesulfonic acid	0.016 U	ND		nc		30
355-46-4	Perfluorohexanesulfonic acid	0.016 U	ND		nc		30
1763-23-1	Perfluorooctanesulfonic acid	0.016 U	ND		nc		30
2355-31-9	MeFOSAA	0.040 U	ND		nc		30
2991-50-6	EtFOSAA	0.040 U	ND		nc		30
27619-97-2	6:2 Fluorotelomer sulfonate	0.040 U	ND		nc		30
39108-34-4	8:2 Fluorotelomer sulfonate	0.040 U	ND		nc		30

CAS No.	Surrogate Recoveries	DUP	FA63114-2	Limits
	13C2-PFHxA	102%	95%	61-134%
	13C2-PFDA	98%	92%	62-128%
	d5-EtFOSAA	93%	87%	57-135%

* = Outside of Control Limits.

Internal Standard Area Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Check Std: S3Q72-CC72	Injection Date: 04/12/19
Lab File ID: 3Q2896.D	Injection Time: 13:04
Instrument ID: GCMS3Q	Method: EPA 537 MOD

	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
Initial Cal ^a	152395	3.62	54057	6.66	220206	6.68	56067	7.25	27347	7.78	245142	8.49
Check Std ^b	160816	3.61	57200	6.66	235284	6.68	59450	7.25	29624	7.78	264954	8.49
Upper Limit ^c	228593	4.61	81086	7.66	330309	7.68	84101	8.25	41021	8.78	367713	9.49
Lower Limit ^d	76198	2.61	27029	5.66	110103	5.68	28034	6.25	13674	6.78	122571	7.49

Lab Sample ID	IS 1		IS 2		IS 3		IS 4		IS 5		IS 6	
	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT	AREA	RT
OP74558-BS	146624	3.62	64716	6.66	237522	6.68	54321	7.25	27019	7.78	246412	8.49
OP74558-MB	136587	3.62	59313	6.67	232114	6.68	51171	7.27	26053	7.78	229754	8.49
FA63114-1	141715	3.62	63303	6.66	239172	6.68	53280	7.27	28058	7.78	227895	8.49
OP74558-MS	142842	3.63	62263	6.67	228506	6.69	53030	7.27	27050	7.78	229440	8.49
FA63114-2	151796	3.63	66578	6.67	256078	6.69	57177	7.27	29017	7.78	254172	8.49
OP74558-DUP	137889	3.63	60081	6.67	230962	6.69	50593	7.27	26663	7.78	231992	8.49
FA63114-3	152089	3.62	60752	6.66	241761	6.68	56401	7.23	21039	7.74	358710	8.25
FA63114-4	148551	3.63	58593	6.67	239582	6.68	57014	7.24	30594	7.75	348970	8.24

- IS 1** = 13C3-PFPeA
- IS 2** = 13C2-6:2FTS
- IS 3** = 13C2-PFOA
- IS 4** = 13C4-PFOS
- IS 5** = d3-MeFOSAA
- IS 6** = 13C2-PFDoDA

- (a) Initial Cal is: S3Q72-ICC72 3Q2815.D 04/11/19 16:18. Area is AVERAGE of initial cal points.
- (b) Check Std Limit = -50 to +50% of initial cal area.
- (c) Upper Limit = +50% of initial standard area; Retention time +1 minutes of check standard.
- (d) Lower Limit = -50% of initial standard area; Retention time -1 minutes of check standard.

6.5.1
6

Surrogate Recovery Summary

Job Number: FA63114
Account: AMECORP Wood Environment & Infrastructure Soln.
Project: Davis Monthan AFB, AZ

Method: EPA 537 MOD	Matrix: AQ
----------------------------	-------------------

Samples and QC shown here apply to the above method

Lab Sample ID	Lab File ID	S1	S2	S3
FA63114-1	3Q2900.D	102	102	92
FA63114-2	3Q2902.D	95	92	87
FA63114-3	3Q2904.D	106	120	118
FA63114-4	3Q2905.D	106	118	64
OP74558-BS	3Q2898.D	110	96	90
OP74558-DUP	3Q2903.D	102	98	93
OP74558-MB	3Q2899.D	107	93	98
OP74558-MS	3Q2901.D	108	108	96

Surrogate Compounds	Recovery Limits
S1 = 13C2-PFHxA	61-134%
S2 = 13C2-PFDA	62-128%
S3 = d5-EtFOSAA	57-135%

6.6.1
6

Initial Calibration Summary

Job Number: FA63114

Sample: S3Q72-ICC72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2815.D

Project: Davis Monthan AFB, AZ

Initial Calibration Report

Compound	Curve Fit	1	2	3	4	5	6	7	8	Avg RF	%RSD
T PFBS	Linear	1.0623	1.0526	1.0213	1.0169	0.9579	1.0294	1.0739	1.0306	1.0306	3.742
T PFHxS	Linear	0.8902	0.8342	0.8530	0.8344	0.7928	0.8449	0.8710	0.8458	0.8458	3.655
T PFHpS	Linear	0.7967	0.7960	0.7522	0.7771	0.7286	0.7750	0.7863	0.7731	0.7731	3.208
T PFOS	Linear	1.1142	1.1056	1.0579	1.0910	1.0080	1.0908	1.1019	1.0813	1.0813	3.417
T PFNS	Linear	0.7057	0.7229	0.6946	0.7036	0.6726	0.6927	0.6863	0.6969	0.6969	2.286
T PFDS	Linear	0.1867	0.1827	0.1706	0.1760	0.1651	0.1757	0.1735	0.1758	0.1758	4.102
I d3-MeFOSAA											
T FOSA	Quadratic	3.5800	3.3681	3.3053	3.3588	3.1564	3.4340	3.4656	3.3812	3.3812	3.939
T MeFOSAA	Linear	1.1577	1.0106	1.0242	0.9994	0.9846	1.0506	1.0968	1.0462	1.0462	5.885
S d5-EFOSAA	Linear	1.1678	1.0614	1.0442	1.0812	1.0300	1.1307	1.1742	1.0985	1.0985	5.371
T EFOSAA	Quadratic	0.9641	0.9702	0.8878	0.9061	0.8795	0.9819	1.0158	0.9436	0.9436	5.545

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Summary

Job Number: FA63114

Account: AMECORP Wood Environment & Infrastructure Soln.

Project: Davis Monthan AFB, AZ

Sample: S3Q72-ICC72

Lab FileID: 3Q2815.D

Initial Calibration Report

Compounds with Curve fitting not using Avg Response Factor:

Compound	Curve Fit	Curve Fit Formula	Curve Fit R2
T PFBA	Linear	$y = 0.270347 * x$	0.998505
T PFPeA	Linear	$y = 1.288331 * x$	0.995770
T PFBS	Linear	$y = 1.061233 * x$	0.999057
S 13C2-PFHxA	Quadratic	$y = 0.013582 * x^2 + 0.897835 * x$	0.999889
T PFHxA	Linear	$y = 0.468637 * x$	0.999347
T PFPeS	Linear	$y = 0.239044 * x$	0.999848
S 13C3-HFPO-DA	Quadratic	$y = -1.737256E-004 * x^2 + 0.062230 * x$	0.999902
T HFPO-DA	Quadratic	$y = -6.031537E-004 * x^2 + 0.210689 * x$	0.999925
T PFHpA	Linear	$y = 1.361583 * x$	0.999141
T PFHxS	Linear	$y = 0.863243 * x$	0.999418
T ADONA	Linear	$y = 1.796498 * x$	0.999184
T PFOA	Linear	$y = 0.807589 * x$	0.999775
T PFHpS	Linear	$y = 0.782234 * x$	0.999701
T PFOS	Linear	$y = 1.096698 * x$	0.999635
T PFNA	Linear	$y = 0.910274 * x$	0.999874
T FOSA	Quadratic	$y = 0.032162 * x^2 + 3.308897 * x$	0.999802
T 9Cl-PF3ONS	Linear	$y = 0.172490 * x$	0.999180
T PFNS	Linear	$y = 0.687282 * x$	0.999946
S 13C2-PFDA	Quadratic	$y = -0.008252 * x^2 + 1.013200 * x$	0.999947
T PFDA	Linear	$y = 0.774908 * x$	0.999843
T MeFOSAA	Linear	$y = 1.083567 * x$	0.999038
S d5-EFOSAA	Linear	$y = 1.160438 * x$	0.998918
T EtFOSAA	Quadratic	$y = 0.020556 * x^2 + 0.914503 * x$	0.999762
T PFDS	Linear	$y = 0.173681 * x$	0.999830
T PFUnDA	Linear	$y = 0.775616 * x$	0.999919
T 11Cl-PF3OUdS	Linear	$y = 0.711305 * x$	0.999452
T PFDoDA	Linear	$y = 0.875980 * x$	0.999793
T PFTfDA	Linear	$y = 1.018528 * x$	0.999762
T PFTeDA	Linear	$y = 0.969828 * x$	0.999454

(RedFont and #) = Outlier Flag; (I) = Internal Standard; (T) = Target; (S) = Surrogate; (M) = Matrix Spike

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2818.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0411_PFC_List_S3Q72\s3q72.batch.bin

Level ID: Calibration File

2:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2811.d
 3:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2812.d
 4:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2813.d
 5:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2814.d
 6:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2815.d
 7:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2816.d
 8:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2817.d

Data File: 3q2818

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	0.000	# -100.0	0.0
6:2FTS	20.000	0.000	# -100.0	0.0
8:2FTS	20.000	0.000	# -100.0	0.0
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	15.901	-20.5	79.5
FOSA	20.000	0.000	# -100.0	0.0
MeFOSAA	20.000	17.476	-12.6	87.4
PFBA	20.000	0.000	# -100.0	0.0
PFBS	20.000	0.000	# -100.0	0.0
PFDA	20.000	0.000	# -100.0	0.0
PFDoDA	20.000	0.000	# -100.0	0.0
PFDS	20.000	0.000	# -100.0	0.0
PFHpA	20.000	0.000	# -100.0	0.0
PFHpS	20.000	0.000	# -100.0	0.0
PFHxA	20.000	0.000	# -100.0	0.0
PFHxS	20.000	0.000	# -100.0	0.0
PFNA	20.000	0.000	# -100.0	0.0
PFNS	20.000	0.000	# -100.0	0.0
PFOA	20.000	17.954	-10.2	89.8
PFOS	20.000	20.715	3.6	103.6
PFPeA	20.000	0.000	# -100.0	0.0
PFPeS	20.000	0.000	# -100.0	0.0
PFTeDA	20.000	0.000	# -100.0	0.0
PFTrDA	20.000	0.000	# -100.0	0.0
PFUnDA	20.000	0.000	# -100.0	0.0
ADONA	20.000	0.000	# -100.0	0.0
9C1-PF3ONS	20.000	0.000	# -100.0	0.0
11C1-PF3OUdS	20.000	0.000	# -100.0	0.0
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0
HFPO-DA	100.000	0.000	# -100.0	0.0

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2818.D

Project: Davis Monthan AFB, AZ

CC Criteria: +/- 25%

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2819.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0411_PFC_List_S3Q72\s3q72.batch.bin

Level ID: Calibration File

2:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2811.d
 3:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2812.d
 4:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2813.d
 5:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2814.d
 6:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2815.d
 7:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2816.d
 8:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2817.d

Data File: 3q2819

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	17.023	-14.9	85.1
6:2FTS	20.000	17.859	-10.7	89.3
8:2FTS	20.000	18.311	-8.4	91.6
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	18.318	-8.4	91.6
FOSA	20.000	18.289	-8.6	91.4
MeFOSAA	20.000	17.668	-11.7	88.3
PFBA	20.000	16.730	-16.3	83.7
PFBS	20.000	15.133	-24.3	75.7
PFDA	20.000	18.162	-9.2	90.8
PFDoDA	20.000	19.087	-4.6	95.4
PFDS	20.000	17.379	-13.1	86.9
PFHpA	20.000	17.955	-10.2	89.8
PFHpS	20.000	17.022	-14.9	85.1
PFHxA	20.000	15.807	-21.0	79.0
PFHxS	20.000	15.296	-23.5	76.5
PFNA	20.000	17.109	-14.5	85.5
PFNS	20.000	17.786	-11.1	88.9
PFOA	20.000	18.111	-9.4	90.6
PFOS	20.000	18.269	-8.7	91.3
PFPeA	20.000	17.387	-13.1	86.9
PFPeS	20.000	15.474	-22.6	77.4
PFTeDA	20.000	16.369	-18.2	81.8
PFTTrDA	20.000	19.629	-1.9	98.1
PFUnDA	20.000	19.544	-2.3	97.7
ADONA	20.000	0.000	# -100.0	0.0
9Cl-PF3ONS	20.000	0.000	# -100.0	0.0
11Cl-PF3OUds	20.000	0.000	# -100.0	0.0
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0
HFPO-DA	100.000	0.000	# -100.0	0.0

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2819.D

Project: Davis Monthan AFB, AZ

CC Criteria: +/- 25%

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2820.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0411_PFC_List_S3Q72\s3q72.batch.bin

Level ID: Calibration File

2:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2811.d
 3:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2812.d
 4:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2813.d
 5:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2814.d
 6:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2815.d
 7:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2816.d
 8:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2817.d

Data File: 3q2820

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	0.000	# -100.0	0.0
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	0.000	# -100.0	0.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	0.000	# -100.0	0.0
6:2FTS	20.000	0.000	# -100.0	0.0
8:2FTS	20.000	0.000	# -100.0	0.0
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	0.000	# -100.0	0.0
EtFOSAA	20.000	17.675	-11.6	88.4
FOSA	20.000	0.000	# -100.0	0.0
MeFOSAA	20.000	16.996	-15.0	85.0
PFBA	20.000	0.000	# -100.0	0.0
PFBS	20.000	19.044	-4.8	95.2
PFDA	20.000	20.898	4.5	104.5
PFDoDA	20.000	19.232	-3.8	96.2
PFDS	20.000	0.000	# -100.0	0.0
PFHpA	20.000	18.440	-7.8	92.2
PFHpS	20.000	0.000	# -100.0	0.0
PFHxA	20.000	18.645	-6.8	93.2
PFHxS	20.000	19.464	-2.7	97.3
PFNA	20.000	20.156	0.8	100.8
PFNS	20.000	0.000	# -100.0	0.0
PFOA	20.000	19.805	-1.0	99.0
PFOS	20.000	18.906	-5.5	94.5
PFPeA	20.000	0.000	# -100.0	0.0
PFPeS	20.000	0.000	# -100.0	0.0
PFTeDA	20.000	20.498	2.5	102.5
PFTTrDA	20.000	20.405	2.0	102.0
PFUnDA	20.000	20.470	2.3	102.3
ADONA	20.000	19.183	-4.1	95.9
9Cl-PF3ONS	20.000	19.235	-3.8	96.2
11Cl-PF3OUds	20.000	19.803	-1.0	99.0
13C3-HFPO-DA	100.000	0.000	# -100.0	0.0
HFPO-DA	20.000	20.595	2.9	102.9

Initial Calibration Verification

Job Number: FA63114

Sample: S3Q72-ICV72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2820.D

Project: Davis Monthan AFB, AZ

CC Criteria: +/- 25%

Continuing Calibration Summary

Job Number: FA63114

Sample: S3Q72-CC72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2896.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0411_PFC_List_S3Q72\s3q72.batch.bin

Level ID: Calibration File

2:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2811.d
 3:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2812.d
 4:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2813.d
 5:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2814.d
 6:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2815.d
 7:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2816.d
 8:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2817.d

Data File: 3q2896

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.043	0.2	100.2
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	18.808	-6.0	94.0
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	18.935	-5.3	94.7
6:2FTS	20.000	19.101	-4.5	95.5
8:2FTS	20.000	19.879	-0.6	99.4
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	18.426	-7.9	92.1
EtFOSAA	20.000	19.503	-2.5	97.5
FOSA	20.000	18.911	-5.4	94.6
MeFOSAA	20.000	17.900	-10.5	89.5
PFBA	20.000	17.113	-14.4	85.6
PFBS	20.000	18.136	-9.3	90.7
PFDA	20.000	20.343	1.7	101.7
PFDoDA	20.000	18.638	-6.8	93.2
PFDS	20.000	19.365	-3.2	96.8
PFHpA	20.000	17.966	-10.2	89.8
PFHpS	20.000	18.619	-6.9	93.1
PFHxA	20.000	17.874	-10.6	89.4
PFHxS	20.000	18.198	-9.0	91.0
PFNA	20.000	18.826	-5.9	94.1
PFNS	20.000	19.418	-2.9	97.1
PFOA	20.000	18.710	-6.4	93.6
PFOS	20.000	18.666	-6.7	93.3
PFPeA	20.000	18.759	-6.2	93.8
PFPeS	20.000	19.179	-4.1	95.9
PFTeDA	20.000	19.545	-2.3	97.7
PFTTrDA	20.000	19.625	-1.9	98.1
PFUnDA	20.000	19.417	-2.9	97.1
ADONA	20.000	17.974	-10.1	89.9
9Cl-PF3ONS	20.000	17.605	-12.0	88.0
11Cl-PF3OUds	20.000	18.034	-9.8	90.2
13C3-HFPO-DA	100.000	100.157	0.2	100.2
HFPO-DA	100.000	98.272	-1.7	98.3

Continuing Calibration Summary

Job Number: FA63114

Sample: S3Q72-CC72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2896.D

Project: Davis Monthan AFB, AZ

CC Criteria: +/- 25%

Continuing Calibration Summary

Job Number: FA63114

Sample: S3Q72-CC72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2906.D

Project: Davis Monthan AFB, AZ

Continuing Calibration Report

Batch: D:\MassHunter\Data\0411_PFC_List_S3Q72\s3q72.batch.bin

Level ID: Calibration File

2:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2811.d
 3:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2812.d
 4:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2813.d
 5:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2814.d
 6:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2815.d
 7:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2816.d
 8:D:\MassHunter\Data\0411_PFC_List_S3Q72\3q2817.d

Data File: 3q2906

Type : QC

Level : 6

Cpnd Name	Exp. Conc	Final Conc	Dev %	Area %
13C2-6:2FTS	---	--ISTD--		
13C2-PFDA	20.000	20.078	0.4	100.4
13C2-PFDoDA	---	--ISTD--		
13C2-PFHxA	20.000	18.881	-5.6	94.4
13C2-PFOA	---	--ISTD--		
13C3-PFPeA	---	--ISTD--		
13C4-PFOS	---	--ISTD--		
4:2FTS	20.000	18.769	-6.2	93.8
6:2FTS	20.000	18.956	-5.2	94.8
8:2FTS	20.000	19.368	-3.2	96.8
d3-MeFOSAA	---	--ISTD--		
d5-EtFOSAA	20.000	18.168	-9.2	90.8
EtFOSAA	20.000	19.412	-2.9	97.1
FOSA	20.000	18.442	-7.8	92.2
MeFOSAA	20.000	18.118	-9.4	90.6
PFBA	20.000	17.305	-13.5	86.5
PFBS	20.000	18.109	-9.5	90.5
PFDA	20.000	20.471	2.4	102.4
PFDoDA	20.000	18.813	-5.9	94.1
PFDS	20.000	19.474	-2.6	97.4
PFHpA	20.000	17.923	-10.4	89.6
PFHpS	20.000	18.599	-7.0	93.0
PFHxA	20.000	18.000	-10.0	90.0
PFHxS	20.000	18.183	-9.1	90.9
PFNA	20.000	18.728	-6.4	93.6
PFNS	20.000	19.581	-2.1	97.9
PFOA	20.000	18.665	-6.7	93.3
PFOS	20.000	18.695	-6.5	93.5
PFPeA	20.000	18.861	-5.7	94.3
PFPeS	20.000	18.578	-7.1	92.9
PFTeDA	20.000	18.663	-6.7	93.3
PFTTrDA	20.000	19.139	-4.3	95.7
PFUnDA	20.000	19.656	-1.7	98.3
ADONA	20.000	17.986	-10.1	89.9
9Cl-PF3ONS	20.000	17.540	-12.3	87.7
11Cl-PF3OUds	20.000	17.820	-10.9	89.1
13C3-HFPO-DA	100.000	98.661	-1.3	98.7
HFPO-DA	100.000	97.178	-2.8	97.2

Continuing Calibration Summary

Job Number: FA63114

Sample: S3Q72-CC72

Account: AMECORP Wood Environment & Infrastructure Soln.

Lab FileID: 3Q2906.D

Project: Davis Monthan AFB, AZ

CC Criteria: +/- 25%

MS Semi-volatiles

Raw Data

7

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Mike Eger
 04/15/19 11:04

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2900.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 2:05:54 PM
 Sample Name : fa63114-1
 Vial : P2-C3
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)	QValue
Internal Standards							
13C2-6:2FTS	6.662	429.0 -> 409.0	63303	20.00	µg/L	0.000	
13C2-PFDoDA	8.494	615.0 -> 570.0	227895	20.00	µg/L	0.000	
13C2-PFOA	6.679	415.0 -> 370.0	239172	20.00	µg/L	0.000	
13C3-PFPeA	3.622	266.0 -> 222.0	141715	20.00	µg/L	0.000	
13C4-PFOS	7.268	503.0 -> 80.0	53280	20.00	µg/L	0.016	
d3-MeFOSAA	7.779	573.0 -> 419.0	28058	20.00	µg/L	0.000	
System Monitoring Compounds							
13C2-PFDA	7.759	515.0 -> 470.0	246235	20.49	µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 102.5%			
13C2-PFHxA	5.024	315.0 -> 270.0	222741	20.43	µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 102.1%			
d5-EtFOSAA	7.903	589.0 -> 419.0	29949	18.40	µg/L	0.000	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 92.0%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.			
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%			
Target Compounds							
4:2FTS	-	327.0 -> 307.0	-	N.D.			
6:2FTS	-	427.0 -> 407.0	-	N.D.			
8:2FTS	-	527.0 -> 507.0	-	N.D.			
EtFOSAA	-	584.0 -> 419.0	-	N.D.			
FOSA	-	498.0 -> 78.0	-	N.D.			
MeFOSAA	-	570.0 -> 419.0	-	N.D.			
PFBA	1.739	213.0 -> 169.0	1021	0.32	µg/L m	100	
PFBS	-	299.0 -> 80.0	-	N.D.			
PFDA	-	513.0 -> 469.0	-	N.D.			
PFDoDA	-	613.0 -> 569.0	-	N.D.			
PFDS	-	599.0 -> 80.0	-	N.D.			
PFHpA	-	363.0 -> 319.0	-	N.D.			
PFHpS	-	449.0 -> 80.0	-	N.D.			
PFHxA	-	313.0 -> 269.0	-	N.D.			
PFHxS	-	399.0 -> 80.0	-	N.D.			
PFNA	-	463.0 -> 419.0	-	N.D.			
PFNS	-	549.0 -> 80.0	-	N.D.			
PFOA	-	413.0 -> 369.0	-	N.D.			
PFOS	-	499.0 -> 80.0	-	N.D.			
PFPeA	-	263.0 -> 219.0	-	N.D.			
PFPeS	-	349.0 -> 80.0	-	N.D.			
PFTeDA	-	713.0 -> 669.0	-	N.D.			
PFTrDA	-	663.0 -> 619.0	-	N.D.			
PFUnDA	-	563.0 -> 519.0	-	N.D.			
ADONA	-	377.0 -> 251.0	-	N.D.			
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.			
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.			
HFPO-DA	-	329.0 -> 169.0	-	N.D.			

7.1.1
7

Perfluorinated Compounds by LC/MS/MS

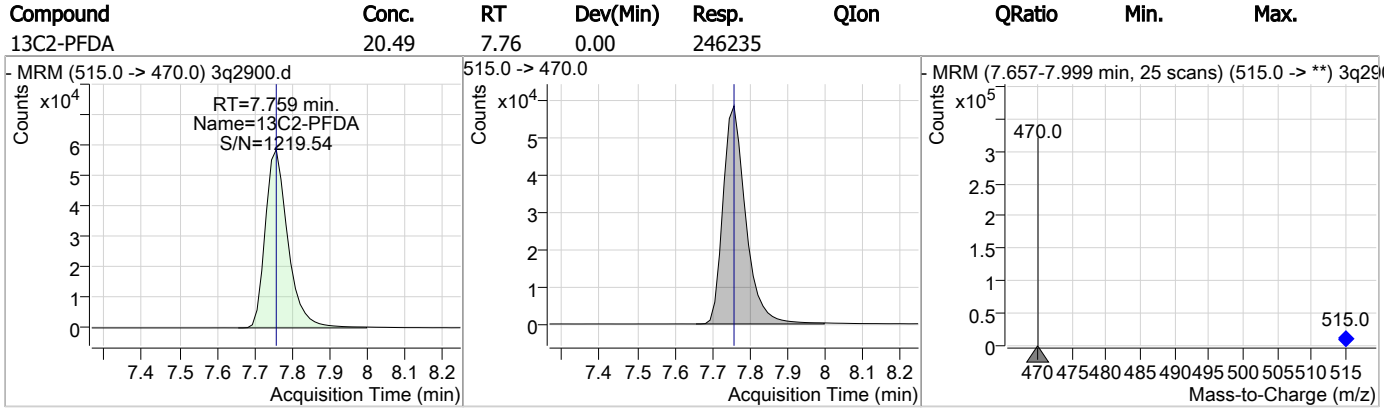
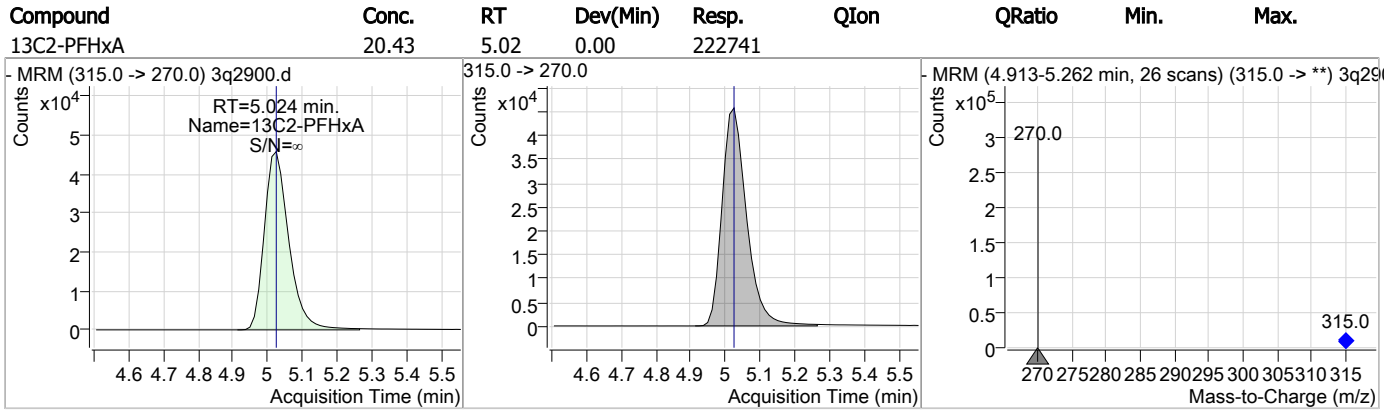
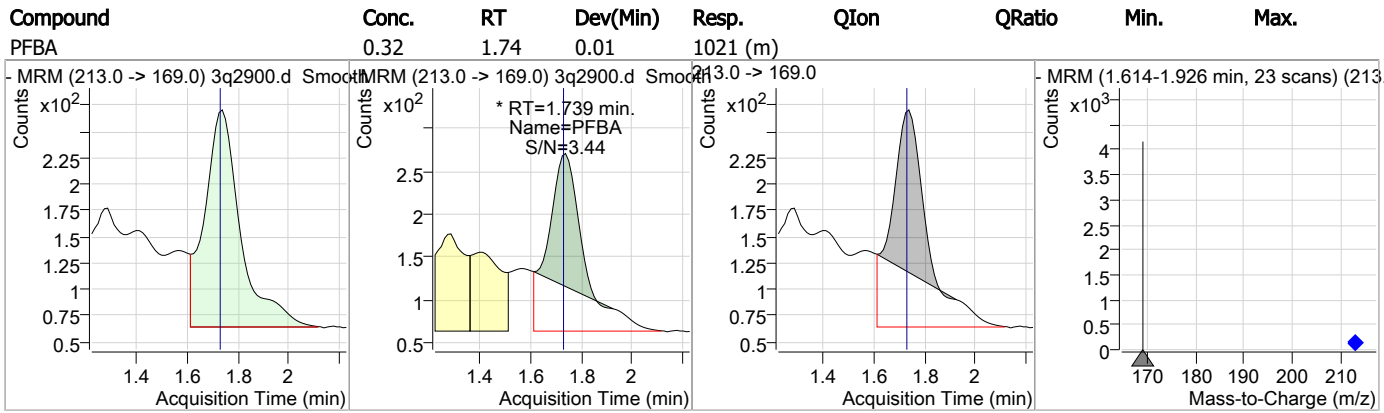
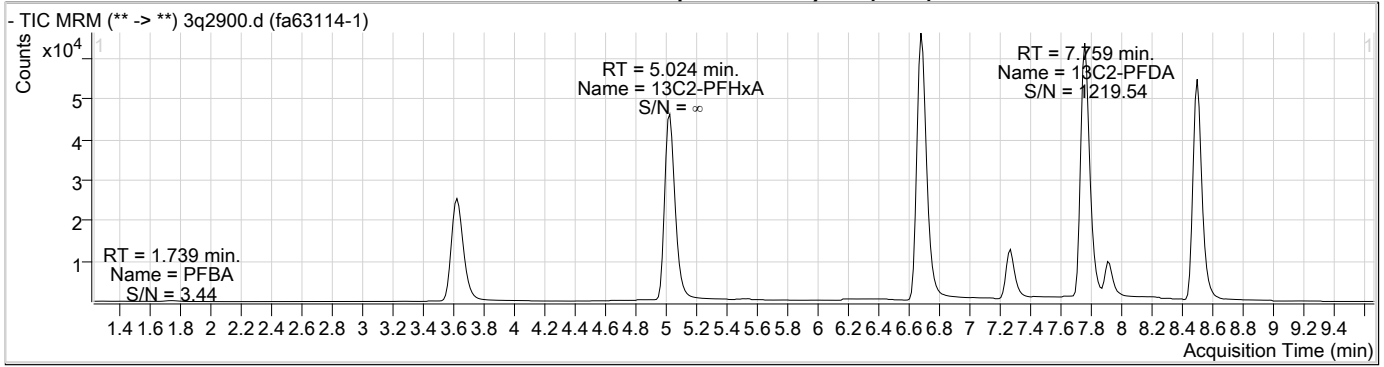
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.1.1
7

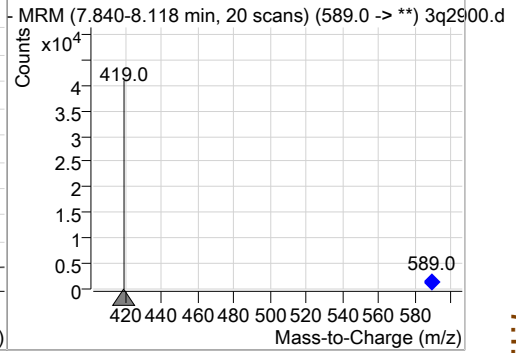
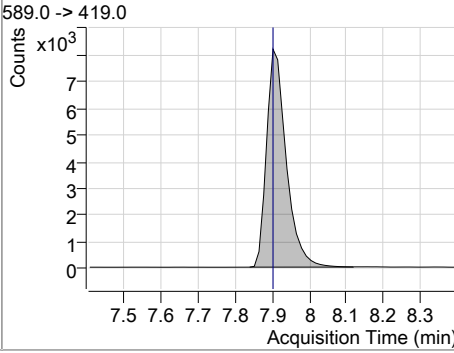
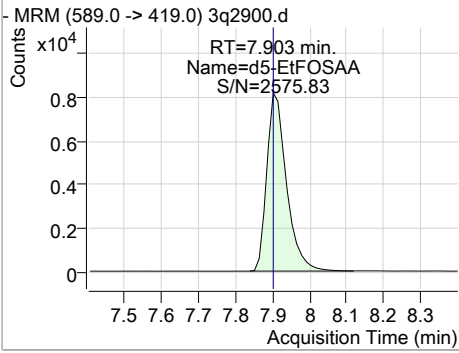


Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	18.40	7.90	0.00	29949				



7.1.1
7



Manual Integration Approval Summary

Sample Number: FA63114-1 **Method:** EPA 537 MOD
Lab FileID: 3Q2900.D **Analyst approved:** 04/15/19 09:06 Nancy Saunders
Injection Time: 04/12/19 14:05 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorobutanoic acid	375-22-4		1.74	Poor instrument integration

7.1.1.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Mike Eger
 04/15/19 11:04

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2902.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 2:36:34 PM
 Sample Name : fa63114-2
 Vial : P2-C5
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	66578	20.00 µg/L	0.013
13C2-PFDoDA	8.494	615.0 -> 570.0	254172	20.00 µg/L	0.000
13C2-PFOA	6.691	415.0 -> 370.0	256078	20.00 µg/L	0.013
13C3-PFPeA	3.634	266.0 -> 222.0	151796	20.00 µg/L	0.013
13C4-PFOS	7.268	503.0 -> 80.0	57177	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	29017	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	237725	18.46 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 92.3%	
13C2-PFHxA	5.036	315.0 -> 270.0	222733	19.10 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 95.5%	
d5-EtFOSAA	7.903	589.0 -> 419.0	29389	17.46 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 87.3%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.726	213.0 -> 169.0	848	0.25 µg/L	100
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	7.269	499.0 -> 80.0	1340	0.43 µg/L	m 92
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUds	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.12
7

Perfluorinated Compounds by LC/MS/MS

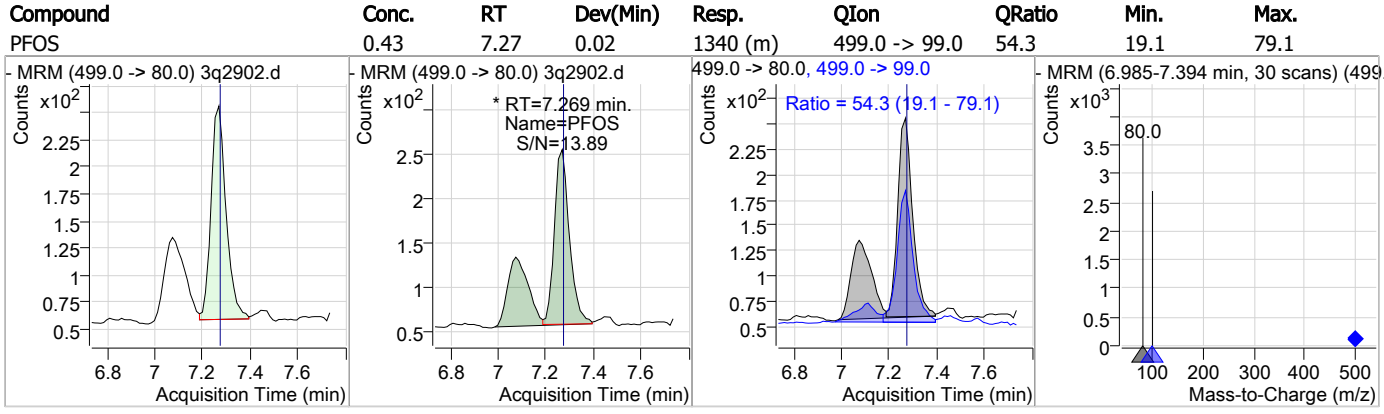
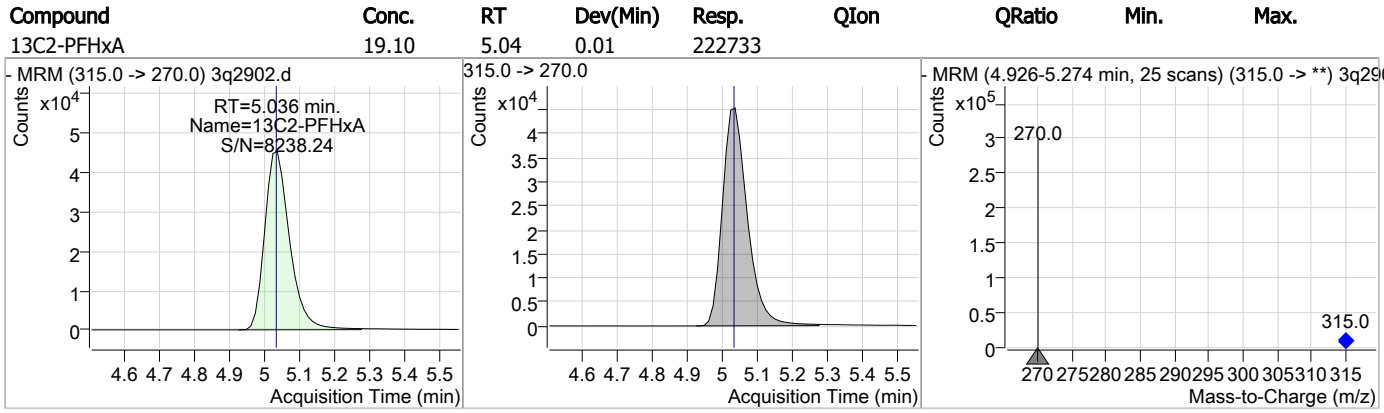
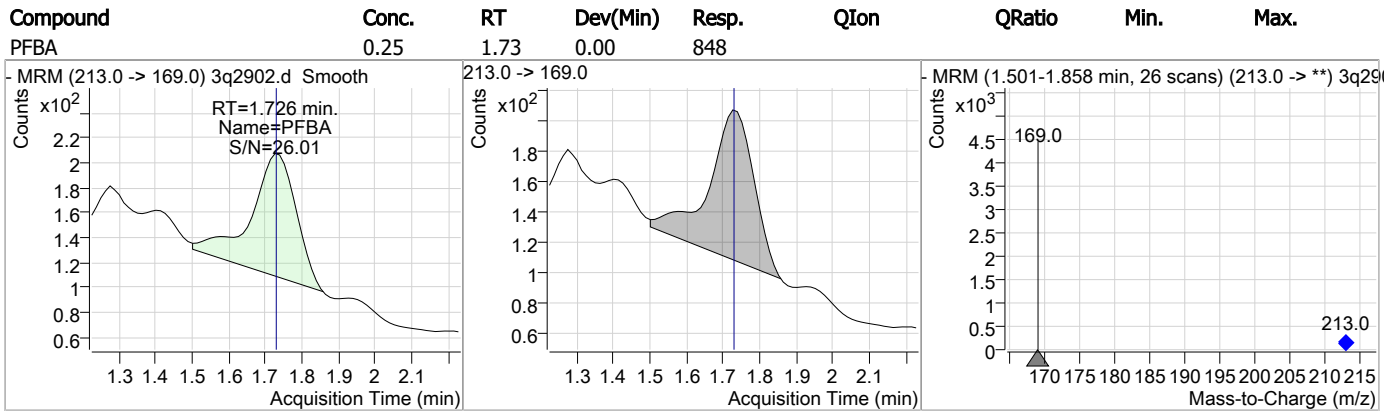
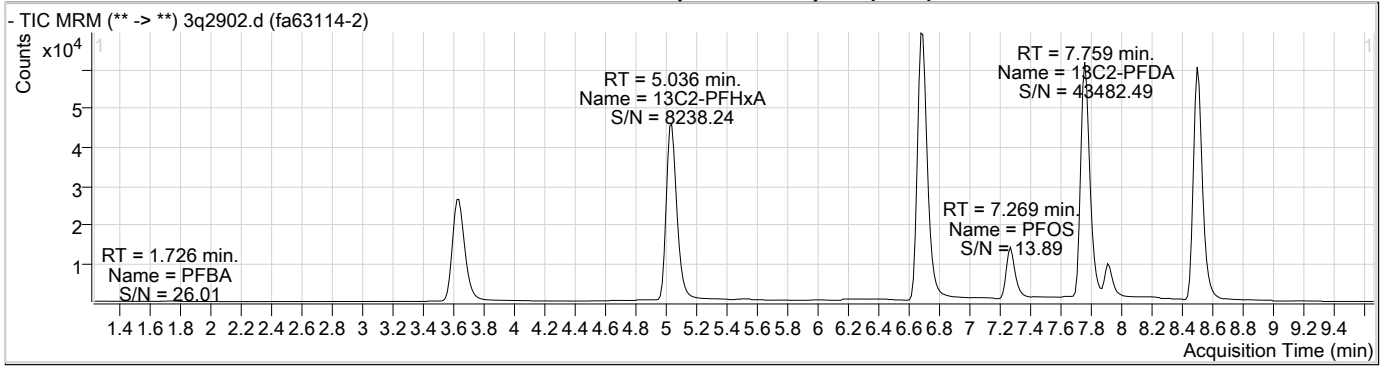
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.1.2

7

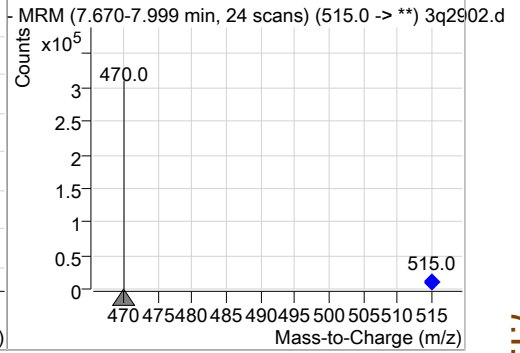
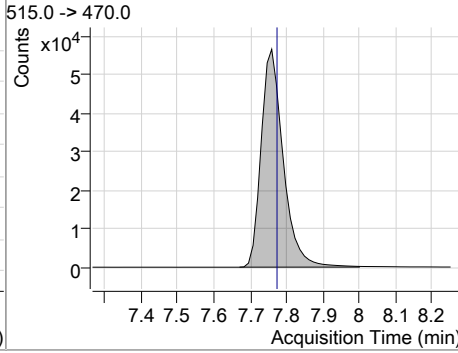
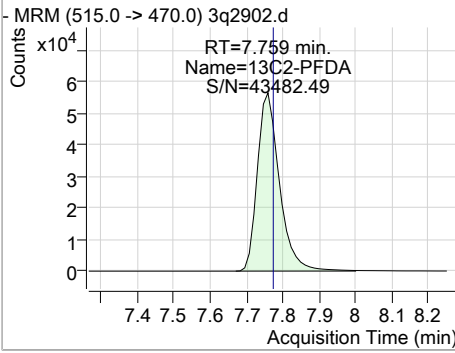
Perfluorinated Compounds by LC/MS/MS



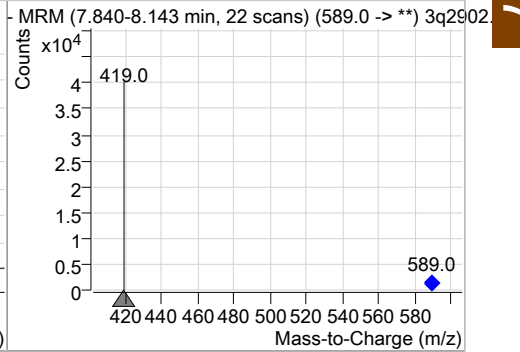
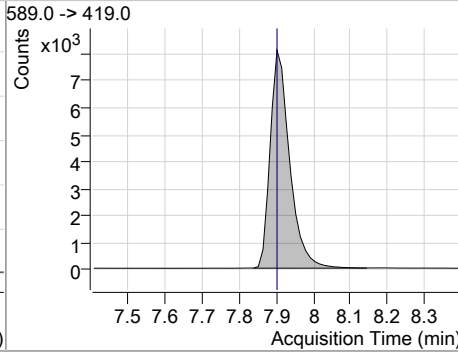
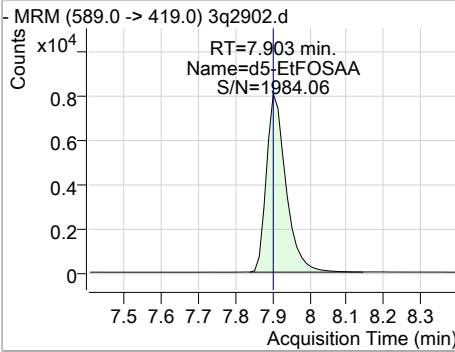
7.12
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	18.46	7.76	0.00	237725				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	17.46	7.90	0.00	29389				



7.12
7

Manual Integration Approval Summary

Sample Number: FA63114-2 **Method:** EPA 537 MOD
Lab FileID: 3Q2902.D **Analyst approved:** 04/15/19 09:06 Nancy Saunders
Injection Time: 04/12/19 14:36 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanesulfonic acid	1763-23-1		7.27	Split peak

7.1.2.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)
 Mike Eger
 04/15/19 11:04

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2904.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 3:07:15 PM
 Sample Name : fa63114-3
 Vial : P2-C7
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	60752	20.00 µg/L	0.000
13C2-PFDoDA	8.253	615.0 -> 570.0	358710	20.00 µg/L	-0.241
13C2-PFOA	6.679	415.0 -> 370.0	241761	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	152089	20.00 µg/L	0.000
13C4-PFOS	7.227	503.0 -> 80.0	56401	20.00 µg/L	-0.025
d3-MeFOSAA	7.740	573.0 -> 419.0	21039	20.00 µg/L	-0.038
System Monitoring Compounds					
13C2-PFDA	7.606	515.0 -> 470.0	290308	23.94 µg/L	-0.153
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 119.7%	
13C2-PFHxA	5.024	315.0 -> 270.0	234816	21.29 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 106.5%	
d5-EtFOSAA	7.890	589.0 -> 419.0	28717	23.52 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 117.6%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.726	213.0 -> 169.0	1243	0.38 µg/L	100
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	7.212	499.0 -> 80.0	2335	0.76 µg/L	m 98
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.1.3
7

Perfluorinated Compounds by LC/MS/MS

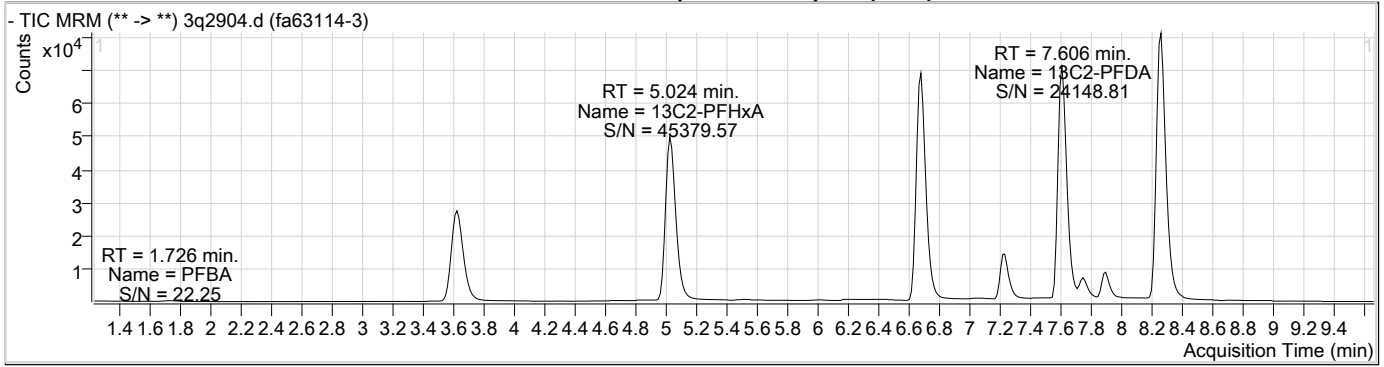
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

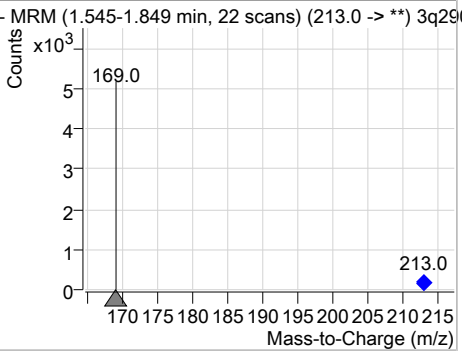
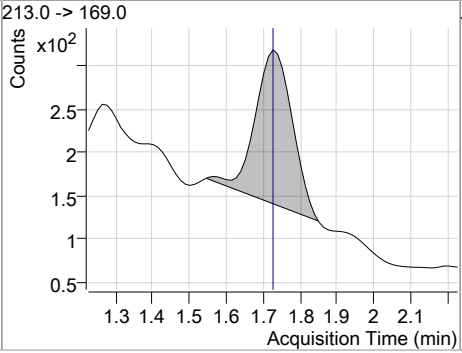
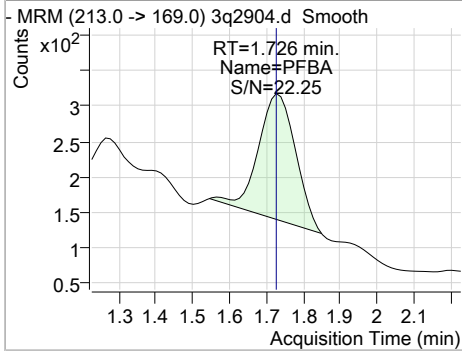
7.1.3

7

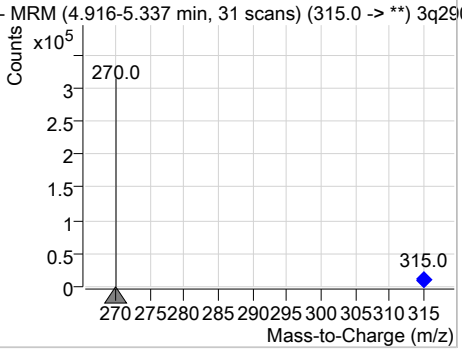
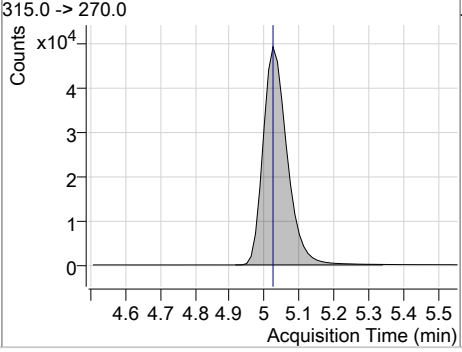
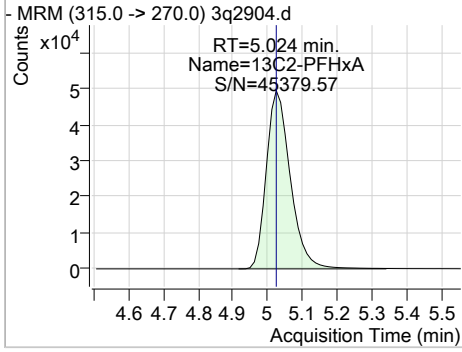
Perfluorinated Compounds by LC/MS/MS



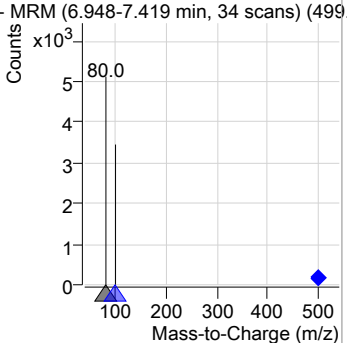
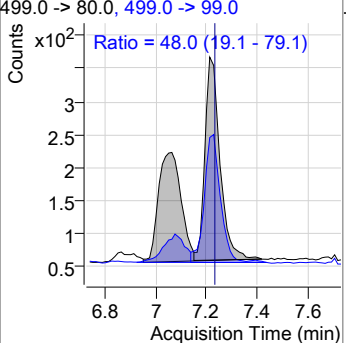
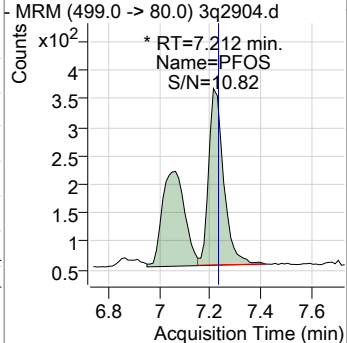
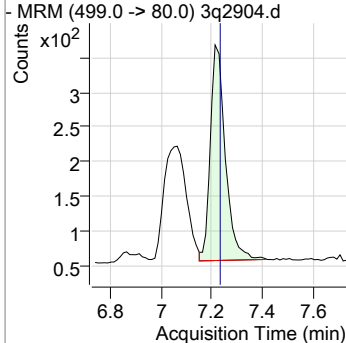
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.38	1.73	0.00	1243				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	21.29	5.02	0.00	234816				

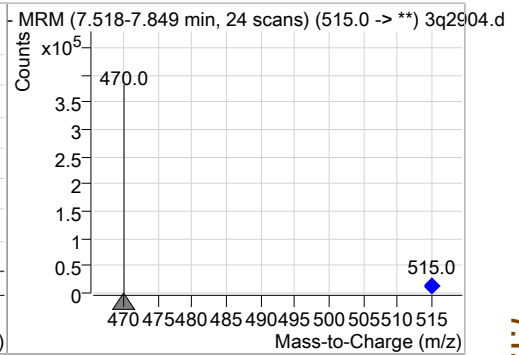
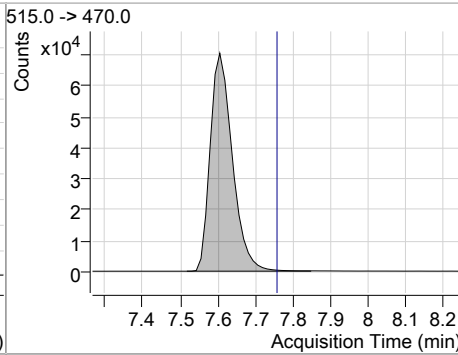
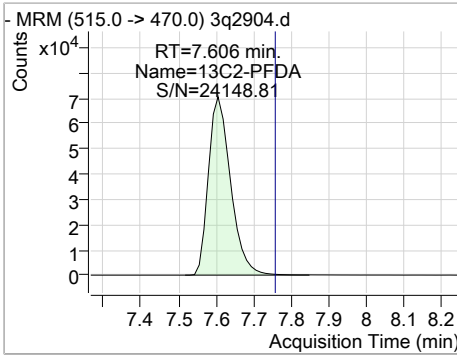


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	0.76	7.21	-0.04	2335 (m)	499.0 -> 99.0	48.0	19.1	79.1

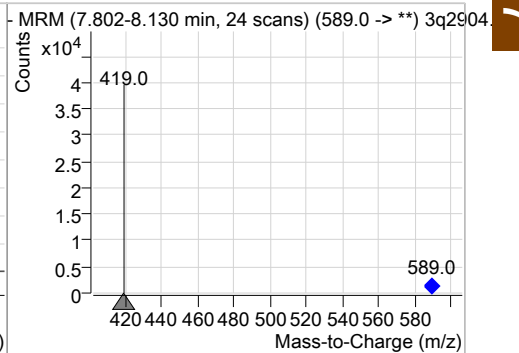
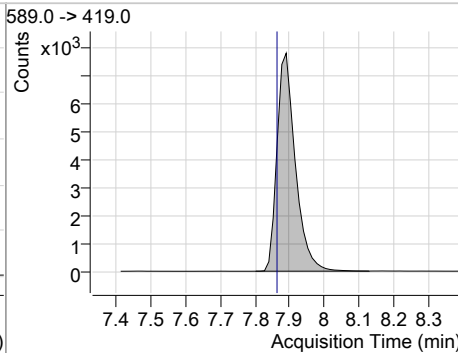
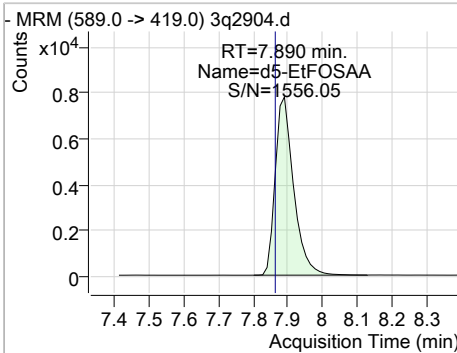


Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	23.94	7.61	-0.15	290308				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	23.52	7.89	-0.01	28717				



7.1.3
7

Manual Integration Approval Summary

Sample Number: FA63114-3 **Method:** EPA 537 MOD
Lab FileID: 3Q2904.D **Analyst approved:** 04/15/19 09:06 Nancy Saunders
Injection Time: 04/12/19 15:07 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanesulfonic acid	1763-23-1		7.21	Split peak

7.1.3.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2905.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 3:22:35 PM
 Sample Name : fa63114-4
 Vial : P2-C8
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	58593	20.00 µg/L	0.013
13C2-PFDoDA	8.240	615.0 -> 570.0	348970	20.00 µg/L	-0.254
13C2-PFOA	6.679	415.0 -> 370.0	239582	20.00 µg/L	0.000
13C3-PFPeA	3.634	266.0 -> 222.0	148551	20.00 µg/L	0.013
13C4-PFOS	7.239	503.0 -> 80.0	57014	20.00 µg/L	-0.013
d3-MeFOSAA	7.753	573.0 -> 419.0	30594	20.00 µg/L	-0.026
System Monitoring Compounds					
13C2-PFDA	7.670	515.0 -> 470.0	284648	23.68 µg/L	-0.089
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 118.4%	
13C2-PFHxA	5.036	315.0 -> 270.0	232432	21.27 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 106.3%	
d5-EtFOSAA	7.890	589.0 -> 419.0	22730	12.80 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 64.0%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	-	327.0 -> 307.0	-	N.D.	QValue
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.14
7



Perfluorinated Compounds by LC/MS/MS

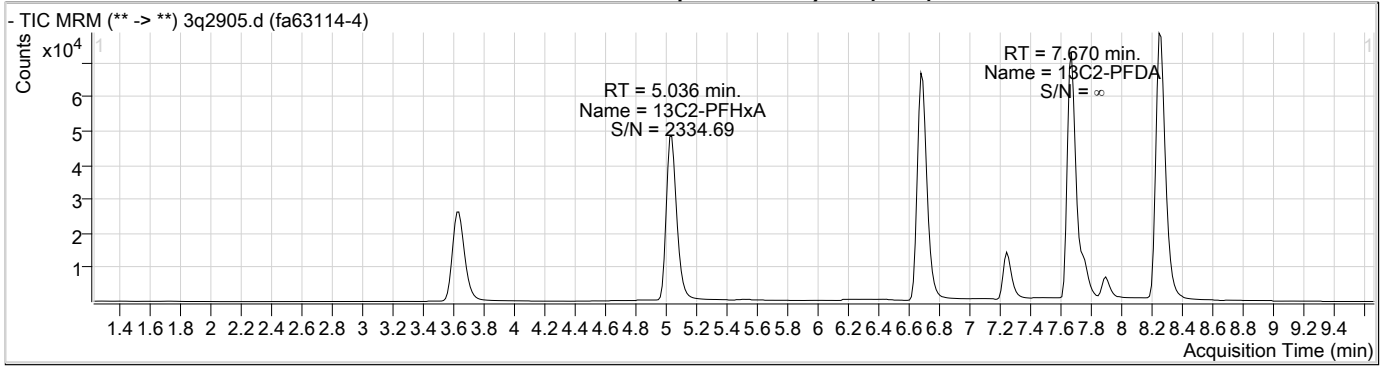
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

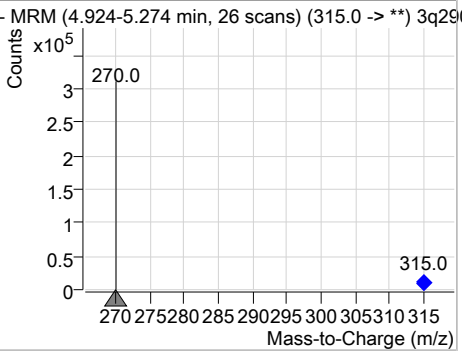
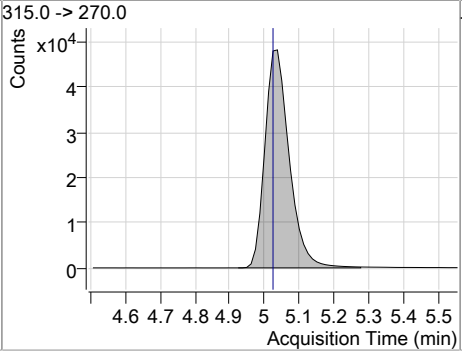
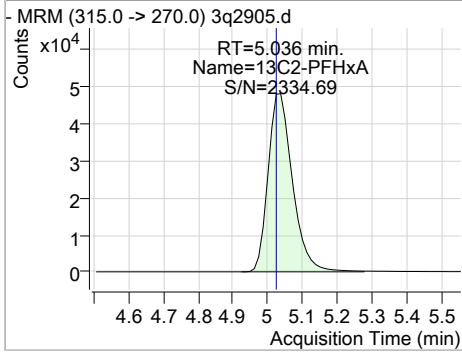
7.1.4
7



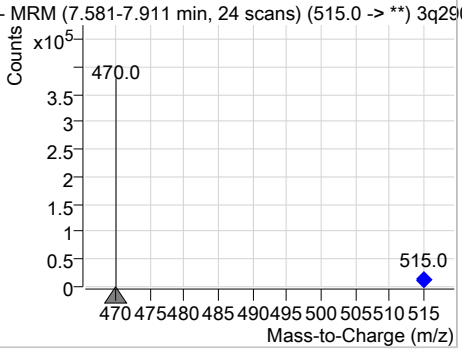
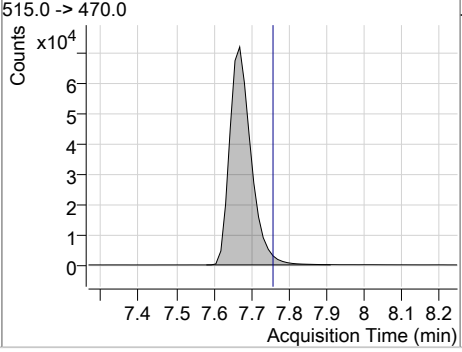
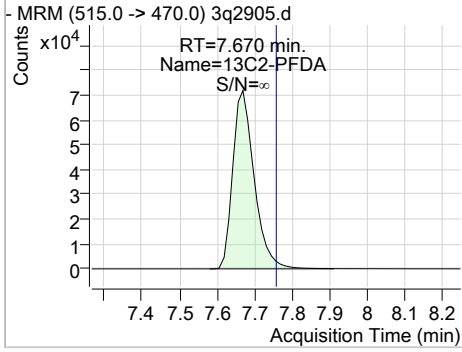
Perfluorinated Compounds by LC/MS/MS



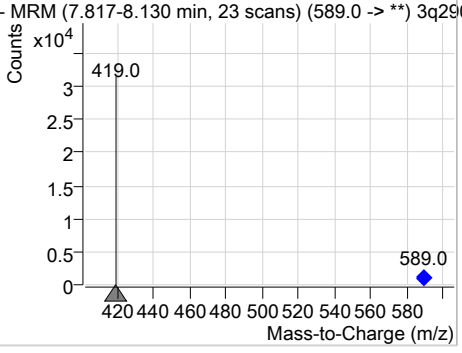
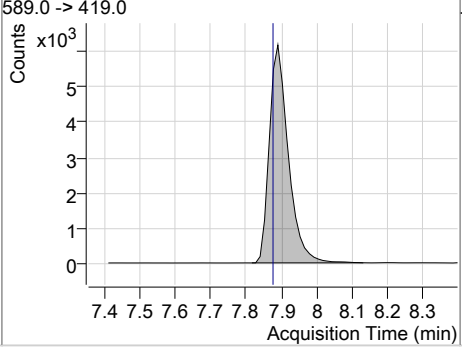
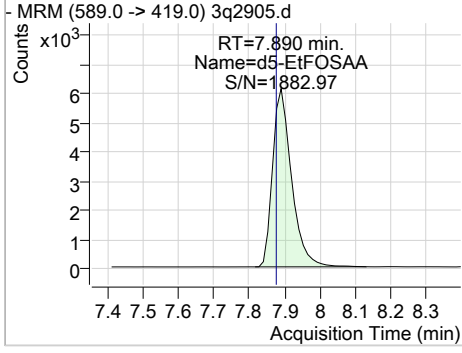
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	21.27	5.04	0.01	232432				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	23.68	7.67	-0.09	284648				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	12.80	7.89	-0.01	22730				



Perfluorinated Compounds by LC/MS/MS

Data File : 3q2899.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 1:50:34 PM
 Sample Name : op74558-mb
 Vial : P2-C2
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	59313	20.00 µg/L	0.013
13C2-PFDoDA	8.494	615.0 -> 570.0	229754	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	232114	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	136587	20.00 µg/L	0.000
13C4-PFOS	7.268	503.0 -> 80.0	51171	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	26053	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	217142	18.61 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 93.0%	
13C2-PFHxA	5.024	315.0 -> 270.0	227651	21.50 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 107.5%	
d5-EtFOSAA	7.903	589.0 -> 419.0	29700	19.65 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 98.2%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
					QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.	
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.739	213.0 -> 169.0	1305	0.42 µg/L	100
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.2.1
7



Perfluorinated Compounds by LC/MS/MS

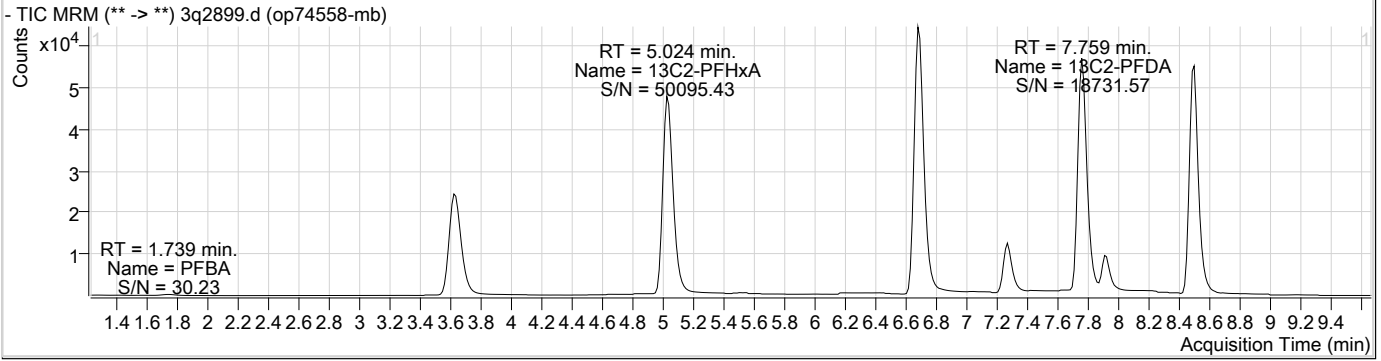
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

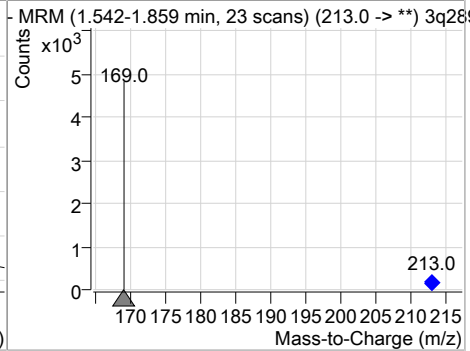
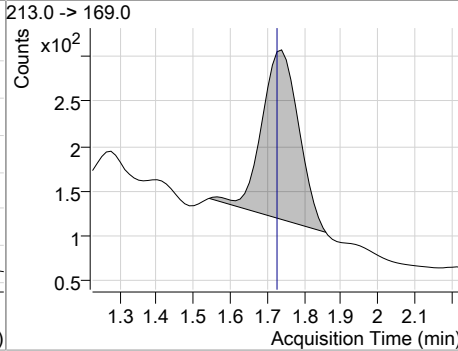
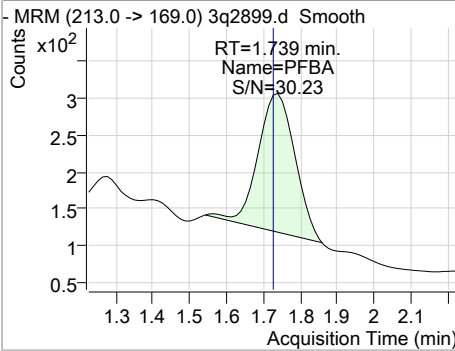
7.2.1

7

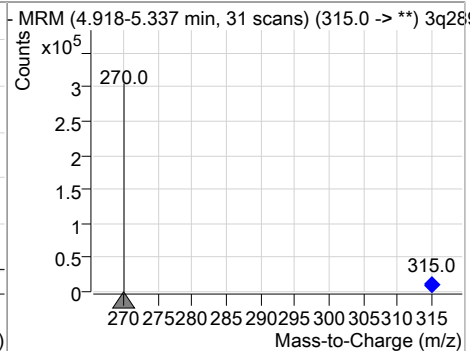
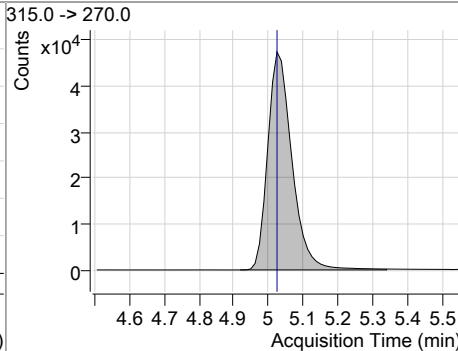
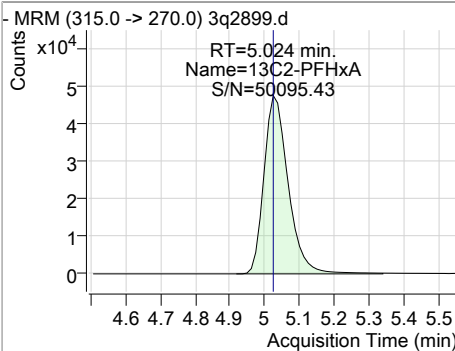
Perfluorinated Compounds by LC/MS/MS



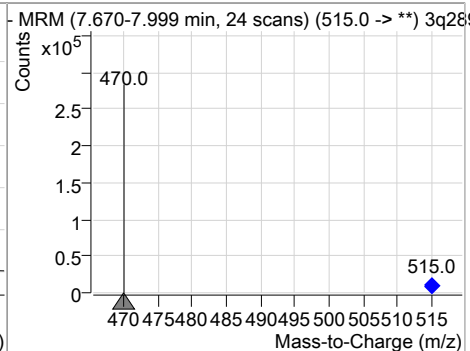
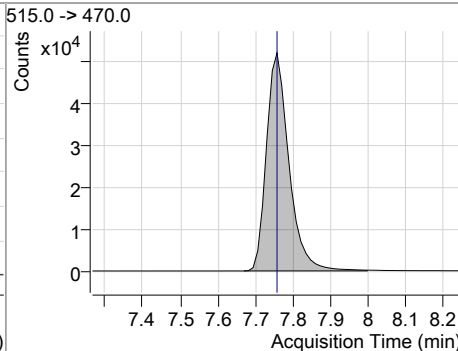
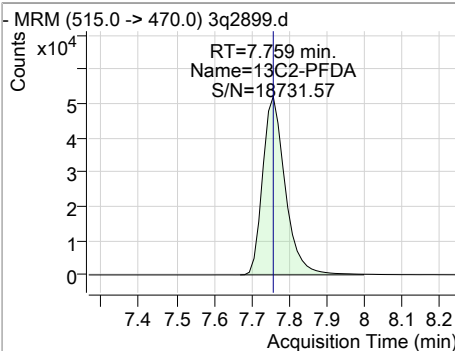
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.42	1.74	0.01	1305				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	21.50	5.02	0.00	227651				

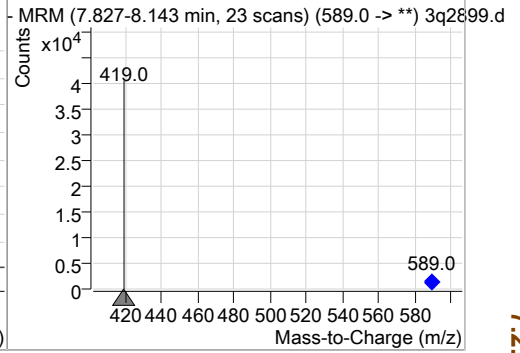
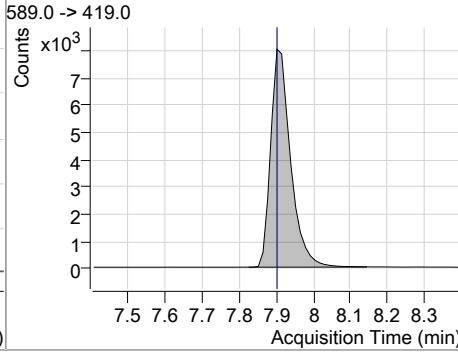
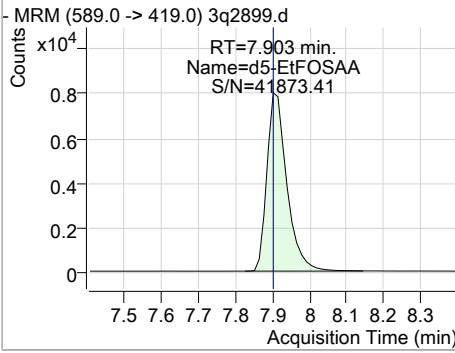


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	18.61	7.76	0.00	217142				



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	19.65	7.90	0.00	29700				



7.2.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2898.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 1:35:14 PM
 Sample Name : op74558-bs
 Vial : P2-C1
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	64716	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	246412	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	237522	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	146624	20.00 µg/L	0.000
13C4-PFOS	7.252	503.0 -> 80.0	54321	20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	27019	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	230143	19.28 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 96.4%	
13C2-PFHxA	5.024	315.0 -> 270.0	238863	22.03 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 110.2%	
d5-EtFOSAA	7.903	589.0 -> 419.0	28150	17.96 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 89.8%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.921	327.0 -> 307.0	62965	17.97 µg/L	QValue 100
6:2FTS	6.663	427.0 -> 407.0	63982	20.60 µg/L	100
8:2FTS	7.784	527.0 -> 507.0	32241	15.18 µg/L	99
EtFOSAA	7.903	584.0 -> 419.0	21547	17.11 µg/L	98
FOSA	7.333	498.0 -> 78.0	80165	17.78 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	24157	16.50 µg/L	98
PFBA	1.739	213.0 -> 169.0	1561	0.49 µg/L	100
PFBS	3.941	299.0 -> 80.0	55184	19.15 µg/L	99
PFDA	7.747	513.0 -> 469.0	157337	17.10 µg/L	100
PFDoDA	8.495	613.0 -> 569.0	185342	17.17 µg/L	100
PFDS	8.117	599.0 -> 80.0	8107	17.19 µg/L	99
PFHpA	5.962	363.0 -> 319.0	302529	18.71 µg/L	100
PFHpS	6.684	449.0 -> 80.0	41105	19.35 µg/L	100
PFHxA	5.025	313.0 -> 269.0	103145	18.53 µg/L	100
PFHxS	6.007	399.0 -> 80.0	44653	19.04 µg/L	m 99
PFNA	7.272	463.0 -> 419.0	193181	17.87 µg/L	100
PFNS	7.730	549.0 -> 80.0	33587	17.99 µg/L	97
PFOA	6.681	413.0 -> 369.0	194536	20.28 µg/L	100
PFOS	7.253	499.0 -> 80.0	51187	17.18 µg/L	m 99
PFPeA	3.625	263.0 -> 219.0	162737	17.23 µg/L	100
PFPeS	5.155	349.0 -> 80.0	34675	19.79 µg/L	100
PFTeDA	9.167	713.0 -> 669.0	205078	17.16 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	213756	17.03 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	167850	17.56 µg/L	100
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.3.1
7

Perfluorinated Compounds by LC/MS/MS

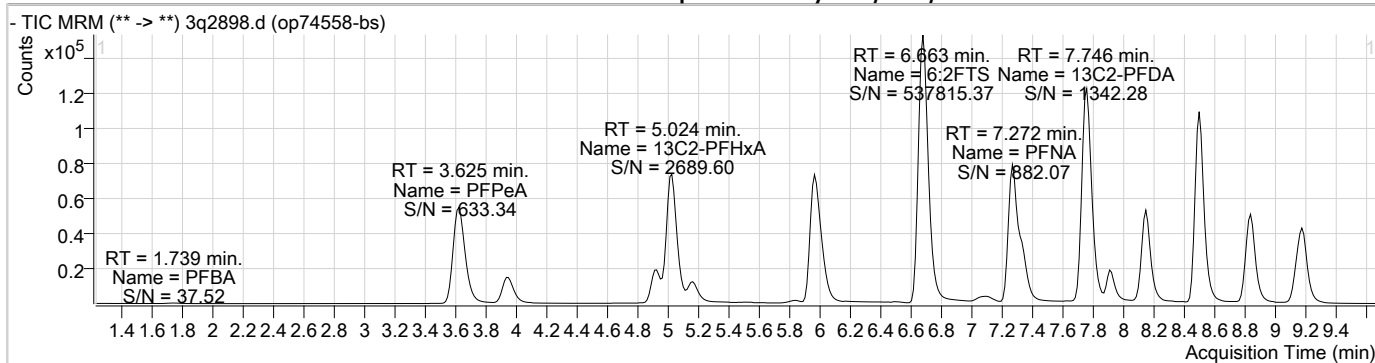
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

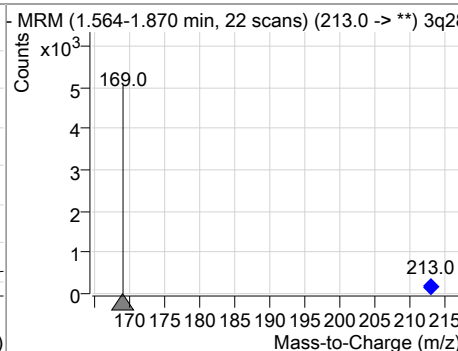
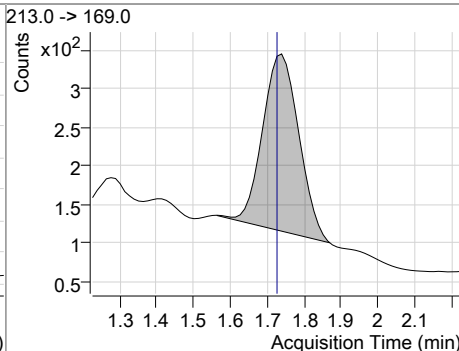
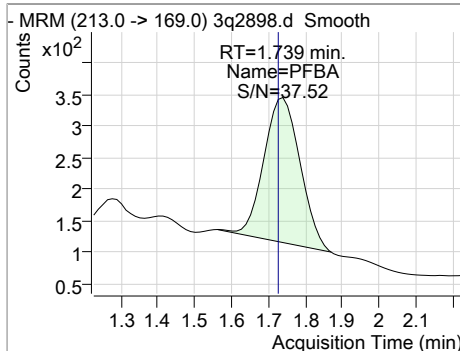
7.3.1

7

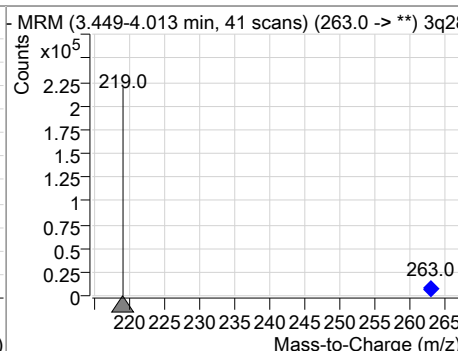
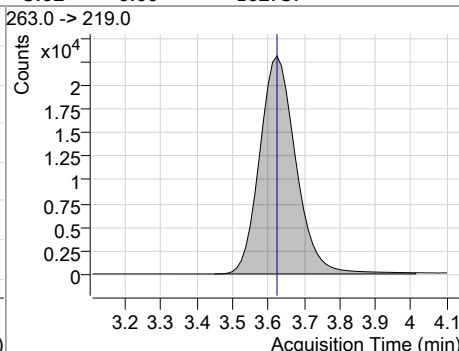
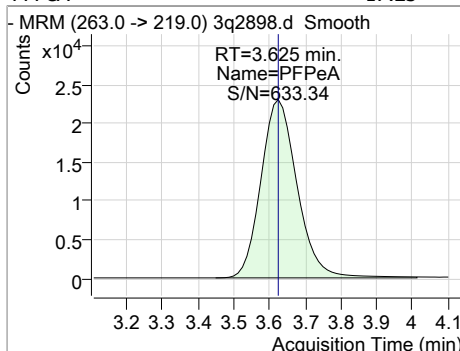
Perfluorinated Compounds by LC/MS/MS



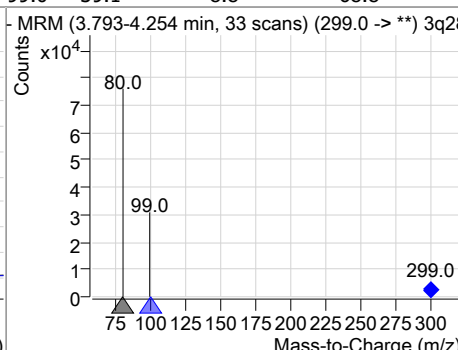
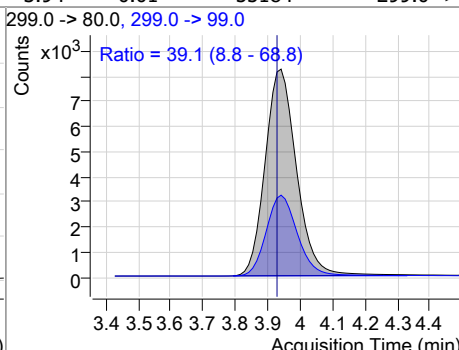
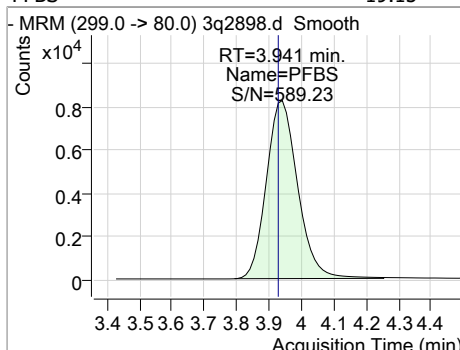
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.49	1.74	0.01	1561				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	17.23	3.62	0.00	162737				

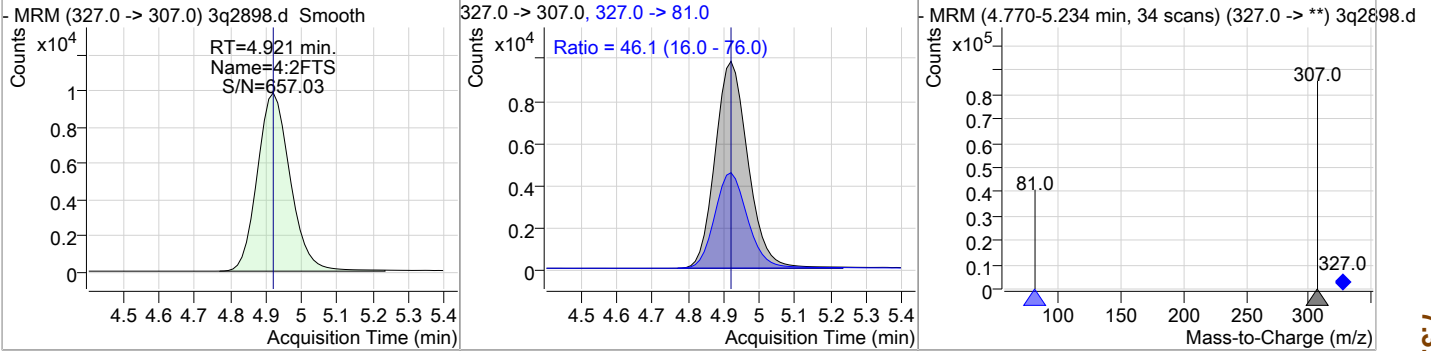


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	19.15	3.94	0.01	55184	299.0 -> 99.0	39.1	8.8	68.8

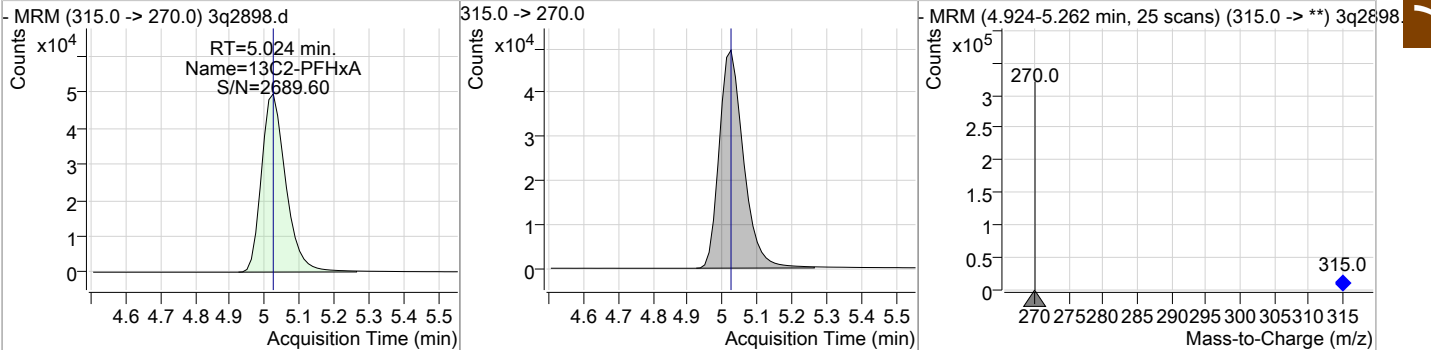


Perfluorinated Compounds by LC/MS/MS

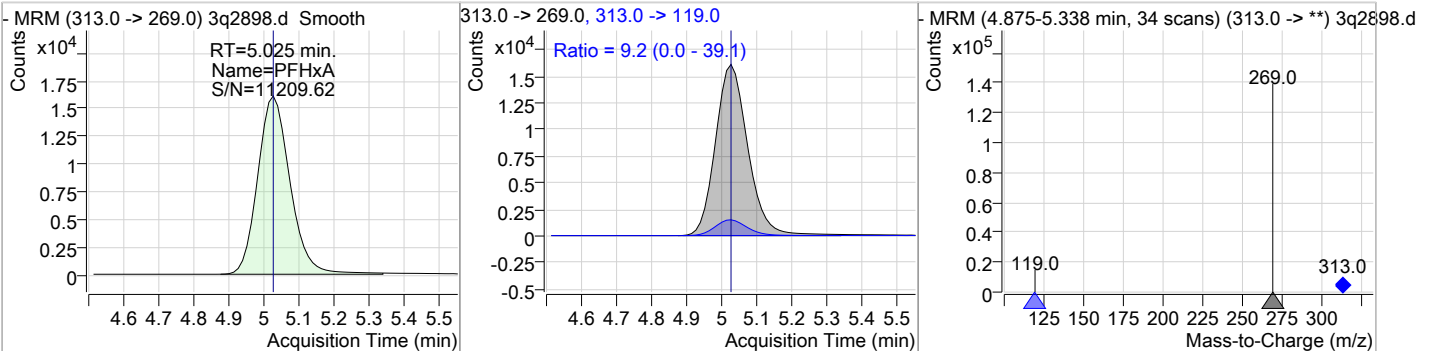
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	17.97	4.92	0.00	62965	327.0 -> 81.0	46.1	16.0	76.0



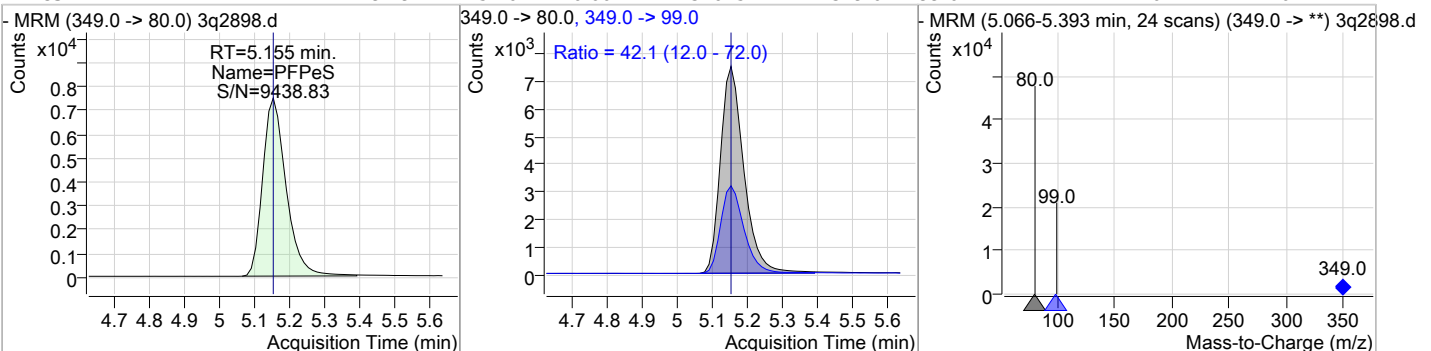
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	22.03	5.02	0.00	238863				



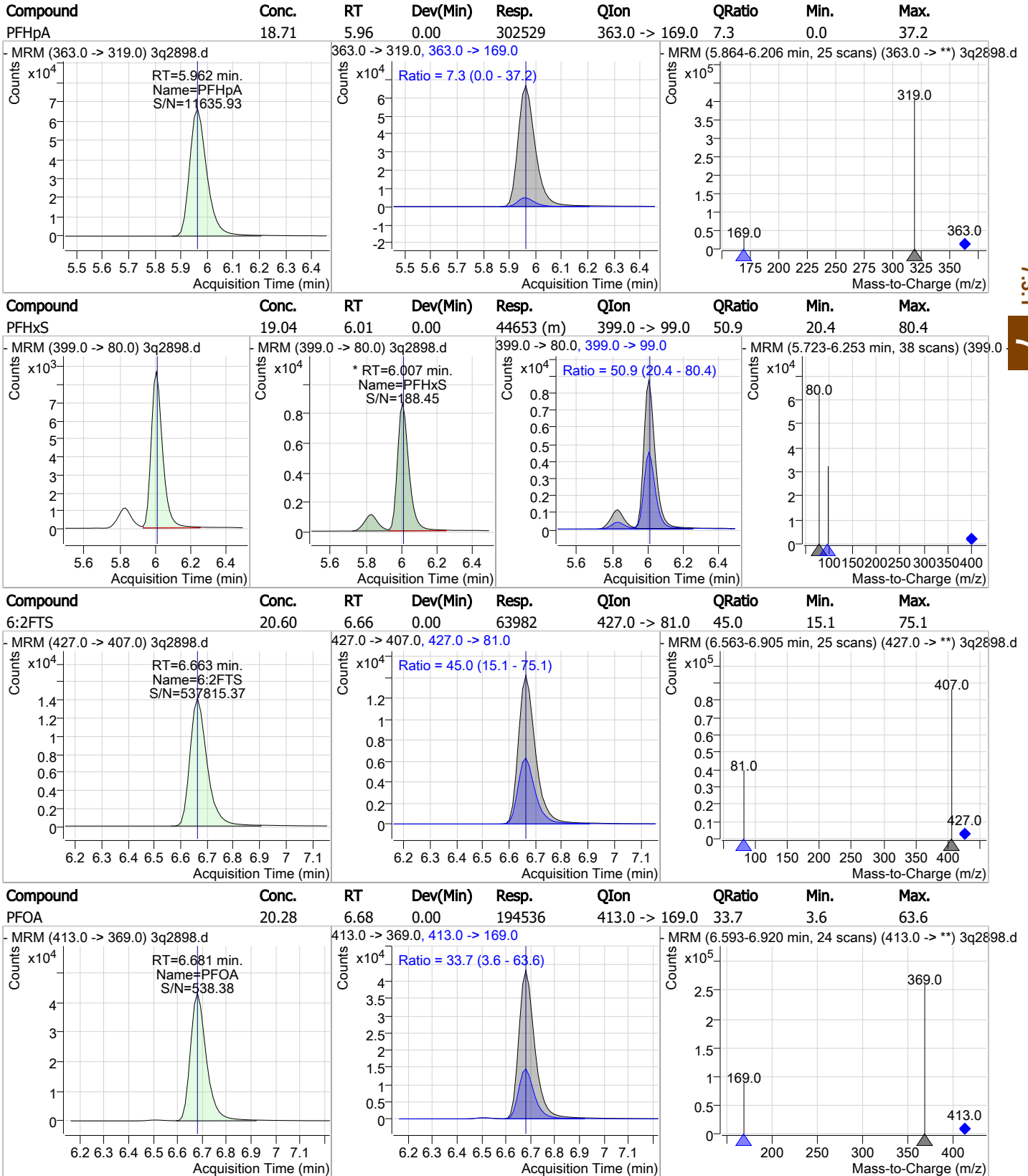
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.53	5.02	0.00	103145	313.0 -> 119.0	9.2	0.0	39.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.79	5.16	0.00	34675	349.0 -> 99.0	42.1	12.0	72.0



Perfluorinated Compounds by LC/MS/MS

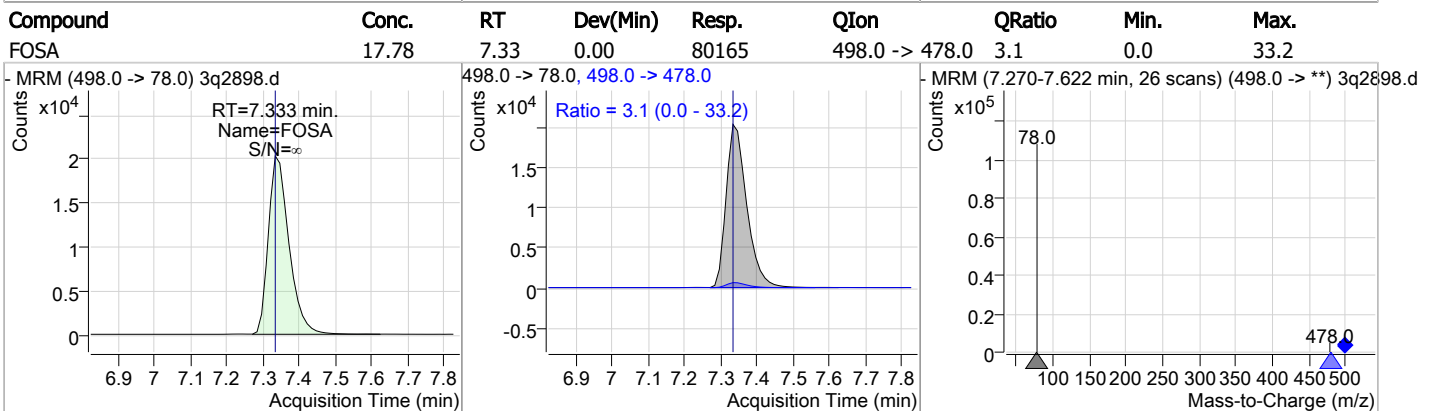
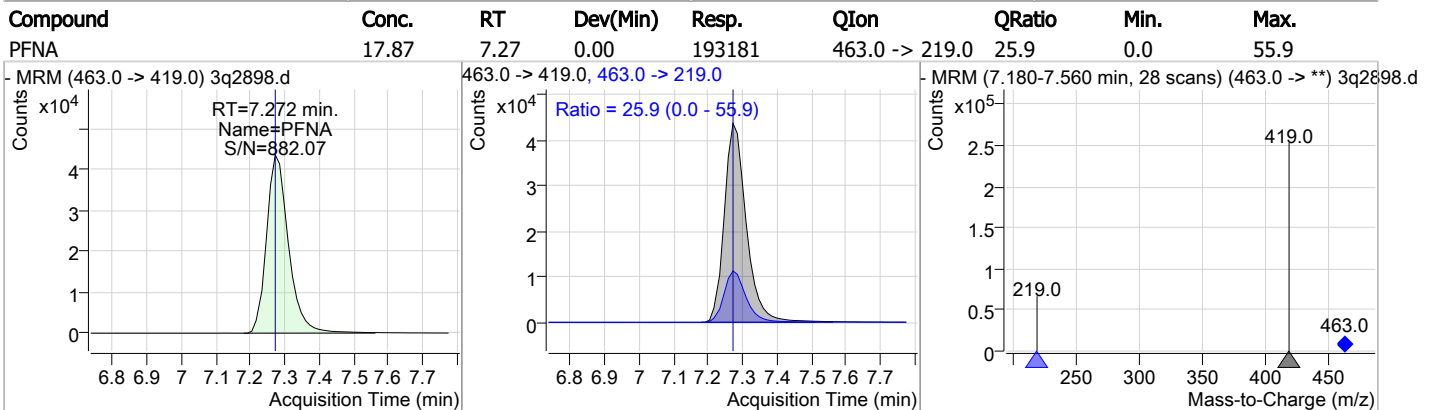
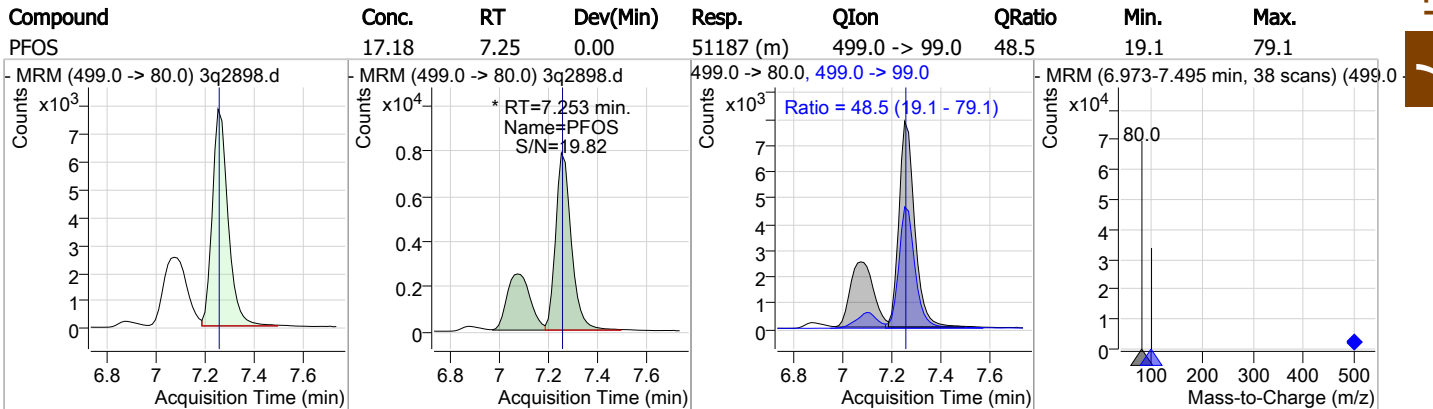
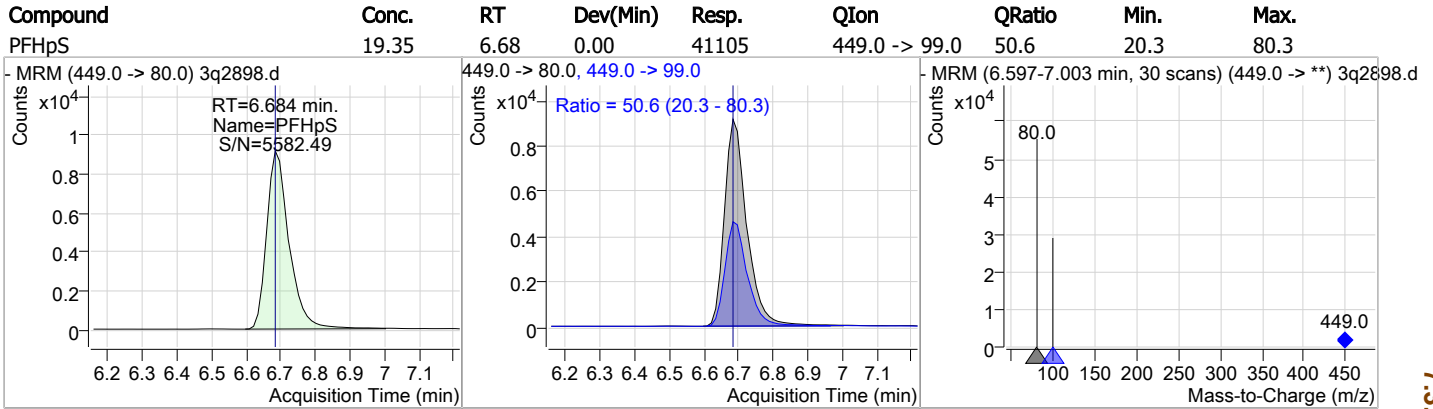


7.3.1

7



Perfluorinated Compounds by LC/MS/MS



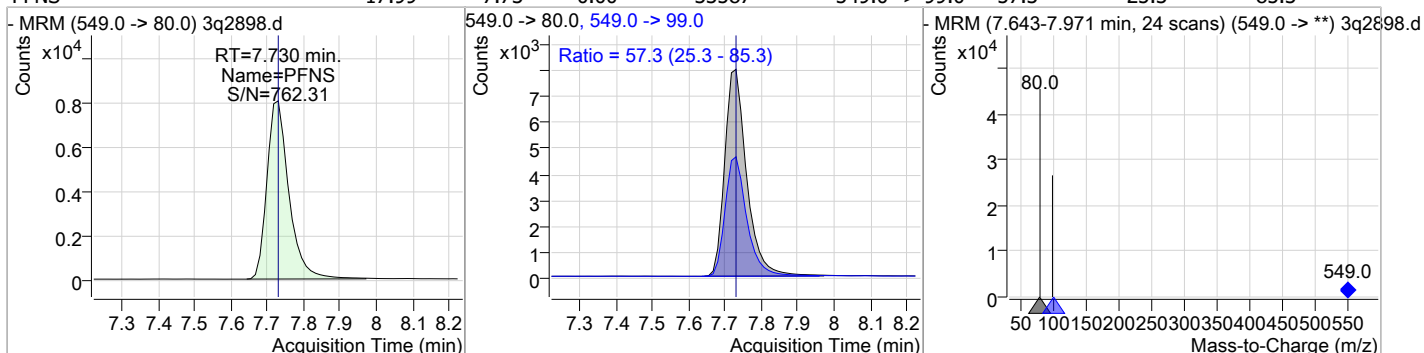
7.3.1

7

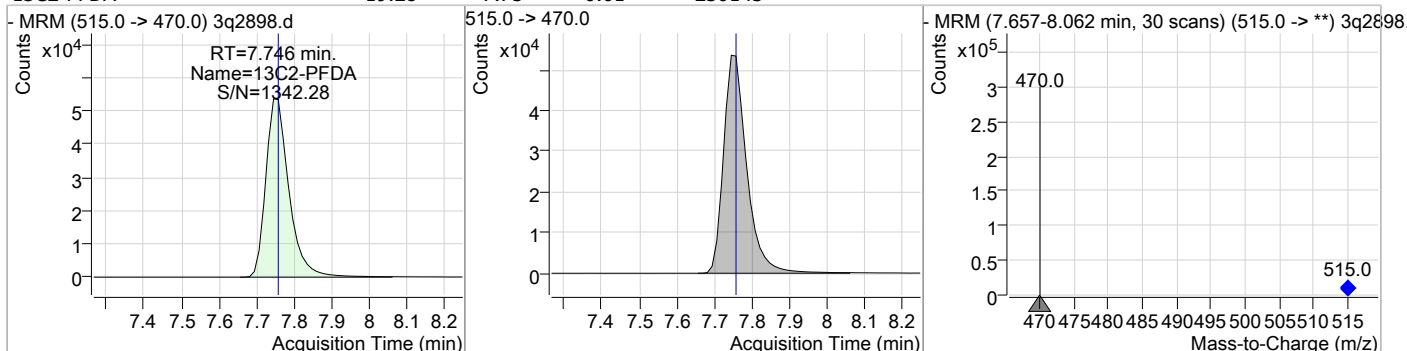


Perfluorinated Compounds by LC/MS/MS

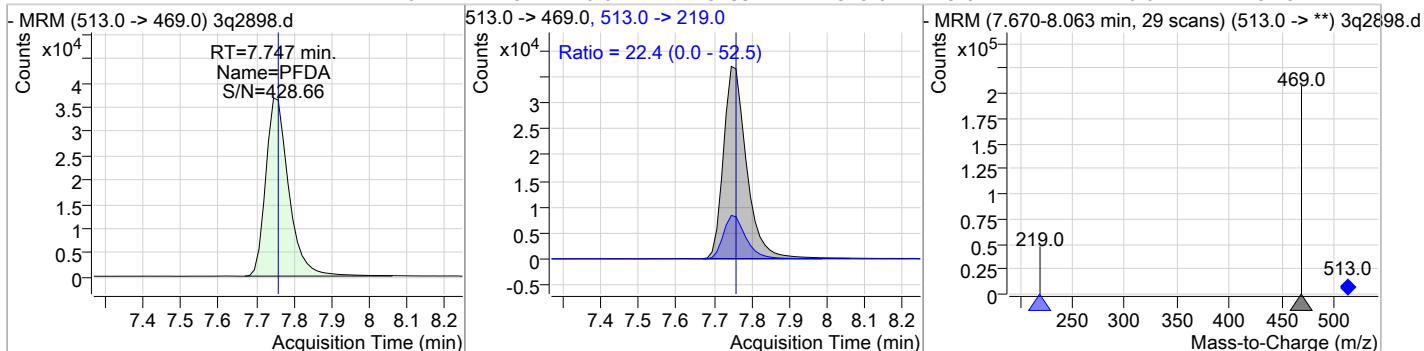
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	17.99	7.73	0.00	33587	549.0 -> 99.0	57.3	25.3	85.3



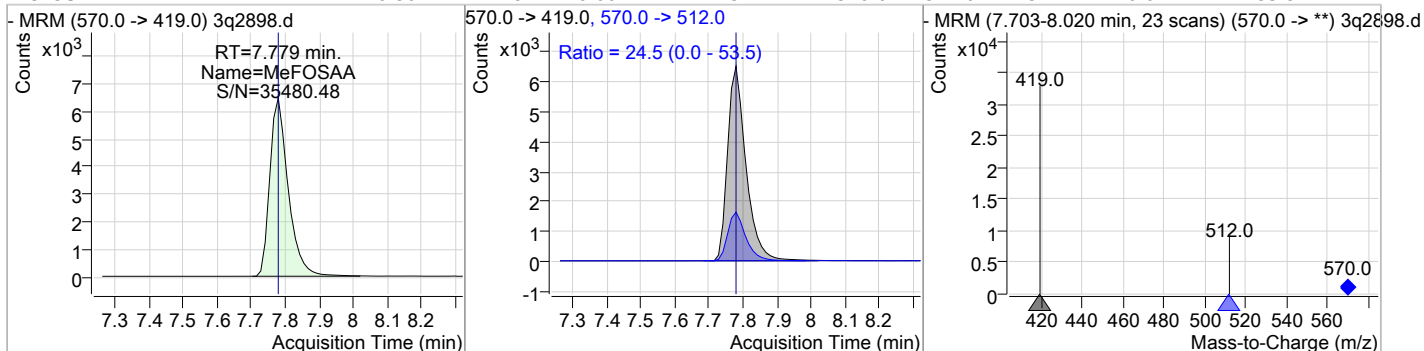
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	19.28	7.75	-0.01	230143				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	17.10	7.75	-0.01	157337	513.0 -> 219.0	22.4	0.0	52.5

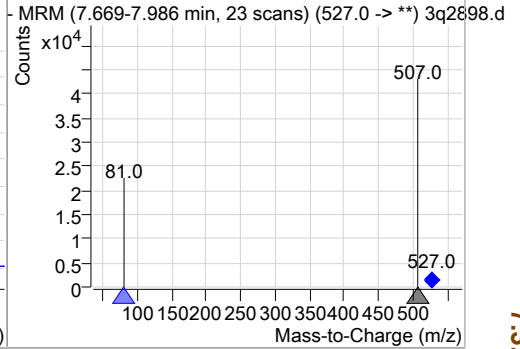
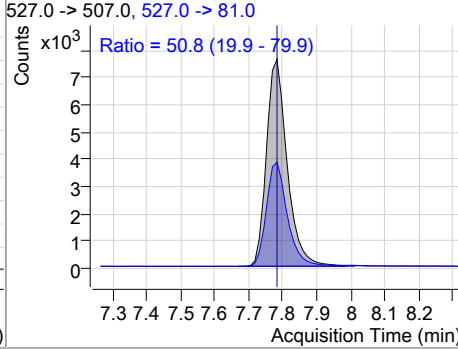
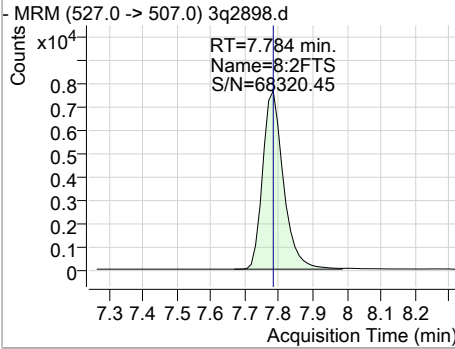


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	16.50	7.78	0.00	24157	570.0 -> 512.0	24.5	0.0	53.5

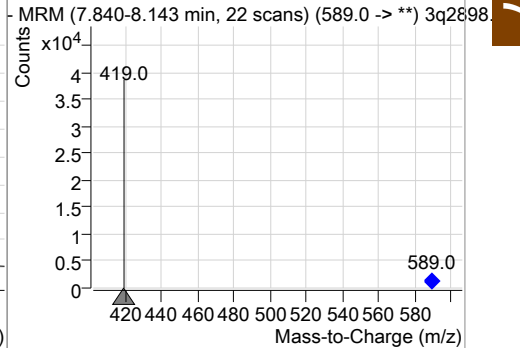
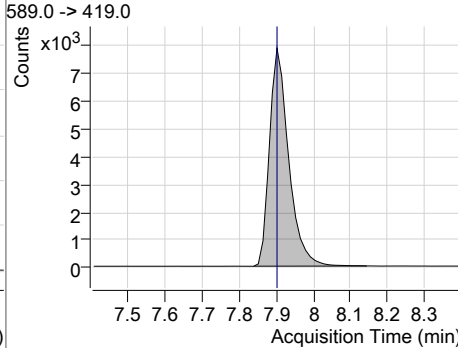
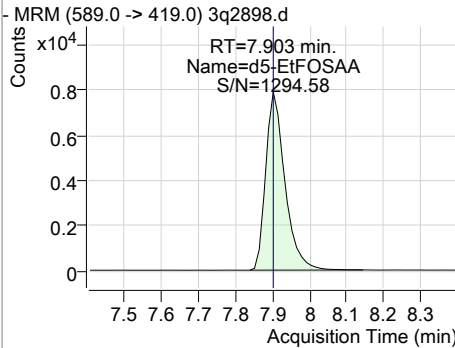


Perfluorinated Compounds by LC/MS/MS

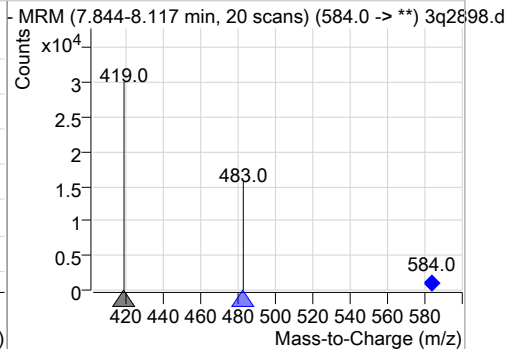
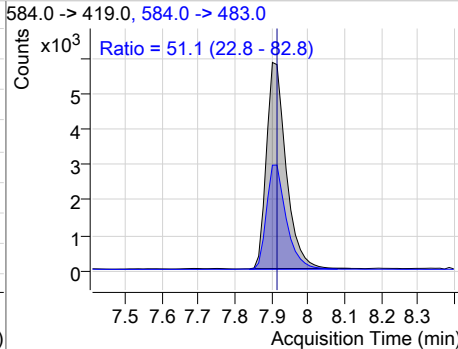
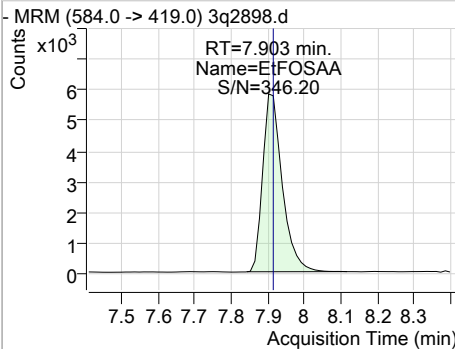
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	15.18	7.78	0.00	32241	527.0 -> 81.0	50.8	19.9	79.9



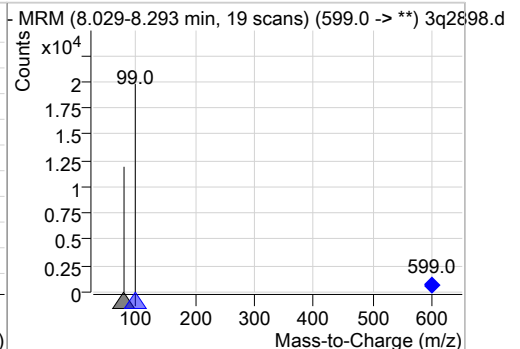
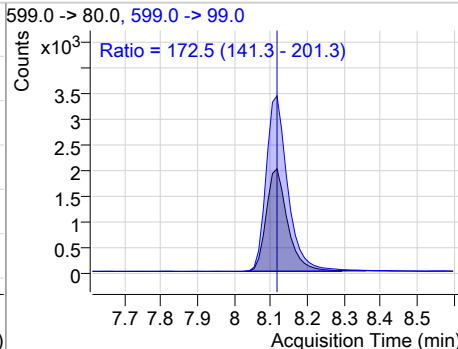
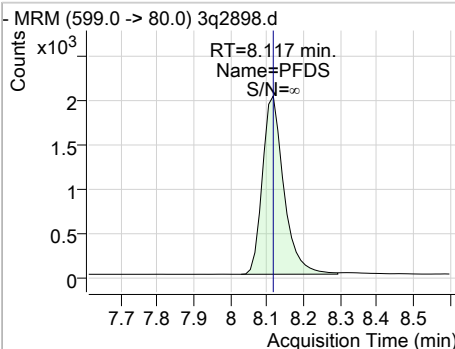
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	17.96	7.90	0.00	28150	589.0 -> 419.0	51.1	22.8	82.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	17.11	7.90	-0.01	21547	584.0 -> 483.0	172.5	141.3	201.3

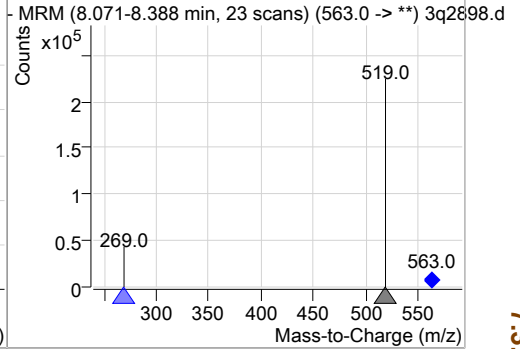
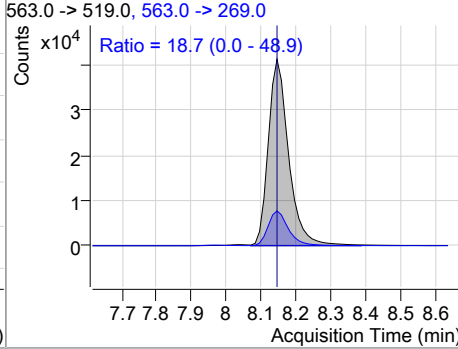
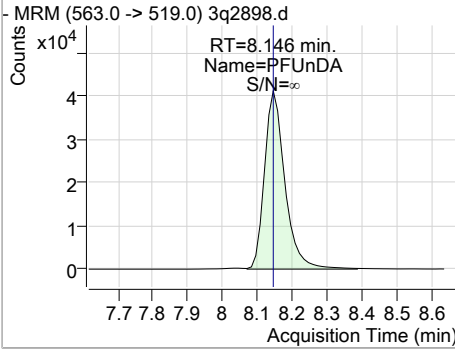


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	17.19	8.12	0.00	8107	599.0 -> 99.0	172.5	141.3	201.3

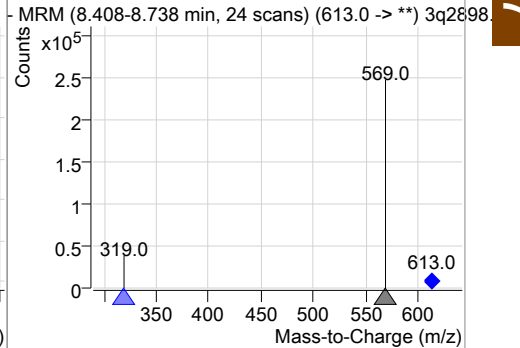
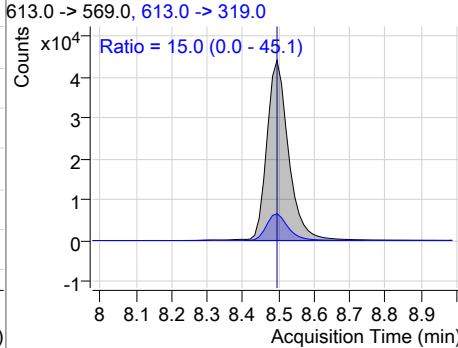
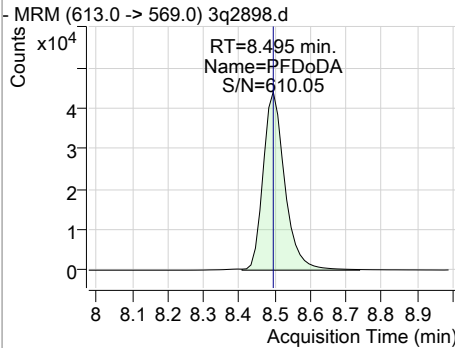


Perfluorinated Compounds by LC/MS/MS

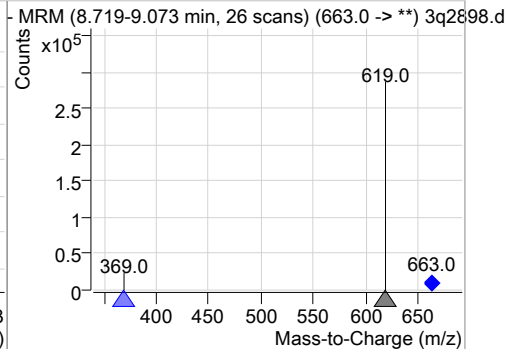
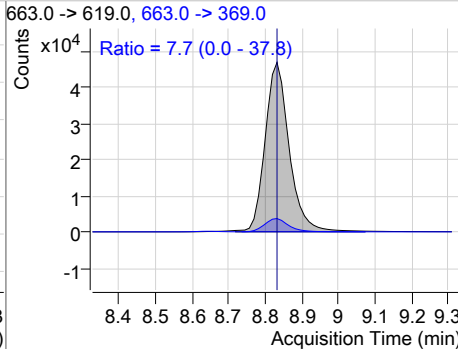
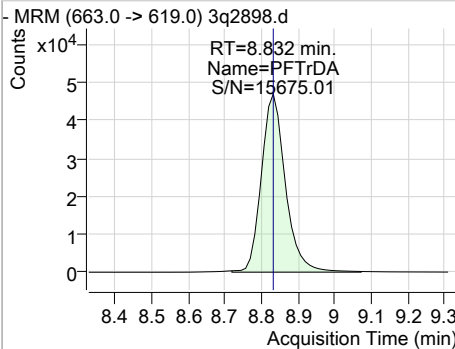
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	17.56	8.15	0.00	167850	563.0 -> 269.0	18.7	0.0	48.9



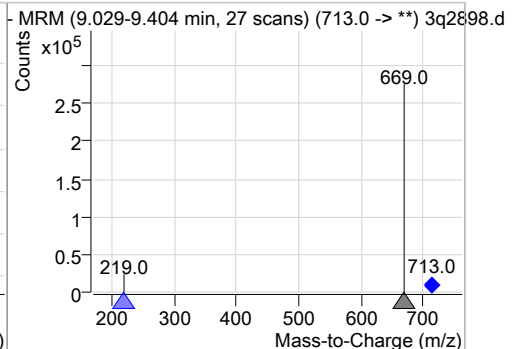
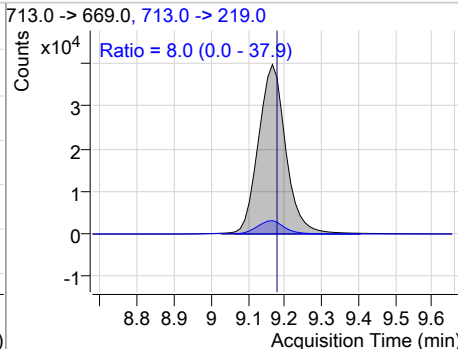
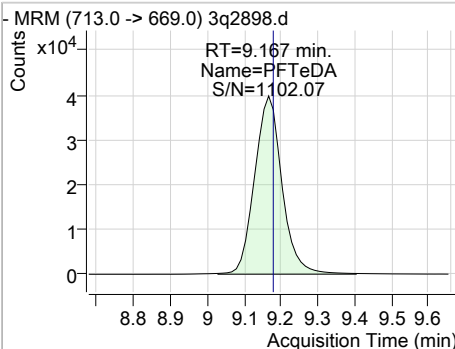
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	17.17	8.50	0.00	185342	613.0 -> 319.0	15.0	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	17.03	8.83	0.00	213756	663.0 -> 369.0	7.7	0.0	37.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	17.16	9.17	-0.01	205078	713.0 -> 219.0	8.0	0.0	37.9



Manual Integration Approval Summary

Sample Number: OP74558-BS **Method:** EPA 537 MOD
Lab FileID: 3Q2898.D **Analyst approved:** 04/15/19 09:03 Nancy Saunders
Injection Time: 04/12/19 13:35 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.3.1.1
7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2901.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 2:21:14 PM
 Sample Name : op74558-ms
 Vial : P2-C4
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	62263	20.00 µg/L	0.013
13C2-PFDoDA	8.494	615.0 -> 570.0	229440	20.00 µg/L	0.000
13C2-PFOA	6.691	415.0 -> 370.0	228506	20.00 µg/L	0.013
13C3-PFPeA	3.634	266.0 -> 222.0	142842	20.00 µg/L	0.013
13C4-PFOS	7.268	503.0 -> 80.0	53030	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	27050	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	246998	21.53 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 107.6%	
13C2-PFHxA	5.024	315.0 -> 270.0	225841	21.66 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 108.3%	
d5-EtFOSAA	7.903	589.0 -> 419.0	30192	19.24 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 96.2%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.933	327.0 -> 307.0	63146	18.73 µg/L	QValue
6:2FTS	6.676	427.0 -> 407.0	64146	21.47 µg/L	100
8:2FTS	7.784	527.0 -> 507.0	36785	18.00 µg/L	100
EtFOSAA	7.916	584.0 -> 419.0	24105	19.08 µg/L	98
FOSA	7.346	498.0 -> 78.0	92095	20.38 µg/L	99
MeFOSAA	7.779	570.0 -> 419.0	27685	18.89 µg/L	99
PFBA	1.739	213.0 -> 169.0	1446	0.47 µg/L	100
PFBS	3.941	299.0 -> 80.0	54681	19.43 µg/L	99
PFDA	7.759	513.0 -> 469.0	178128	20.12 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	187852	18.69 µg/L	99
PFDS	8.117	599.0 -> 80.0	8554	18.58 µg/L	98
PFHpA	5.975	363.0 -> 319.0	306030	19.67 µg/L	100
PFHpS	6.696	449.0 -> 80.0	43418	20.93 µg/L	100
PFHxA	5.037	313.0 -> 269.0	101676	18.99 µg/L	99
PFHxS	6.020	399.0 -> 80.0	45852	20.03 µg/L	m 100
PFNA	7.284	463.0 -> 419.0	222947	21.44 µg/L	100
PFNS	7.730	549.0 -> 80.0	36111	19.82 µg/L	99
PFOA	6.693	413.0 -> 369.0	196235	21.27 µg/L	100
PFOS	7.269	499.0 -> 80.0	56648	19.48 µg/L	m 99
PFPeA	3.637	263.0 -> 219.0	169242	18.39 µg/L	100
PFPeS	5.168	349.0 -> 80.0	34454	20.18 µg/L	99
PFTeDA	9.167	713.0 -> 669.0	182851	16.43 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	204059	17.46 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	179530	20.18 µg/L	100
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.4.1
7

Perfluorinated Compounds by LC/MS/MS

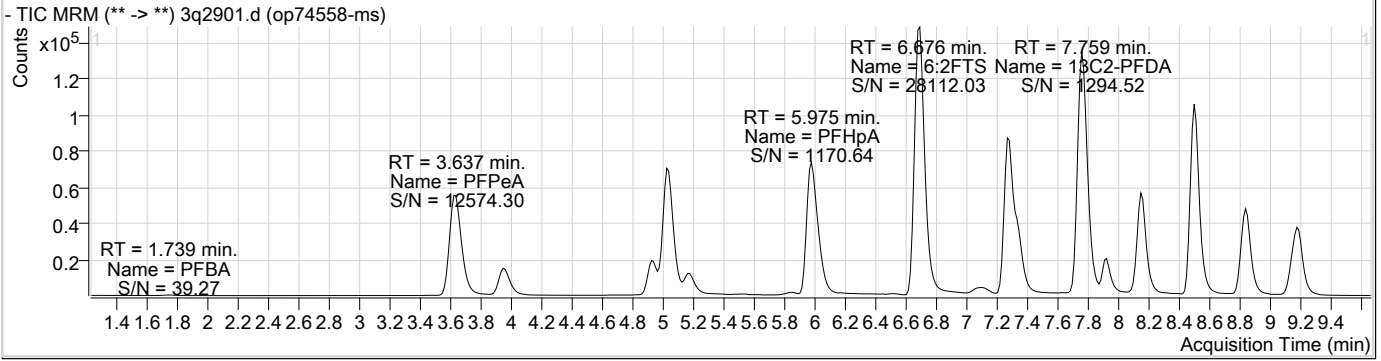
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

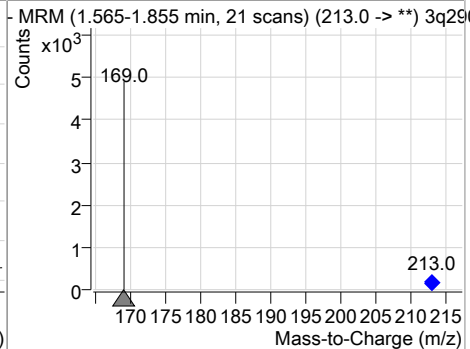
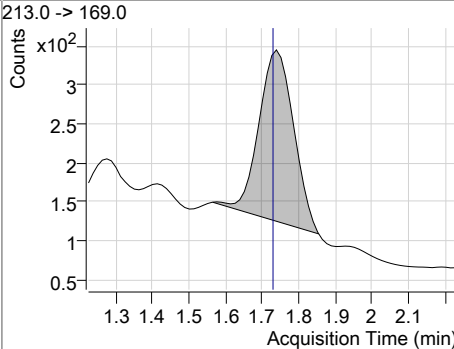
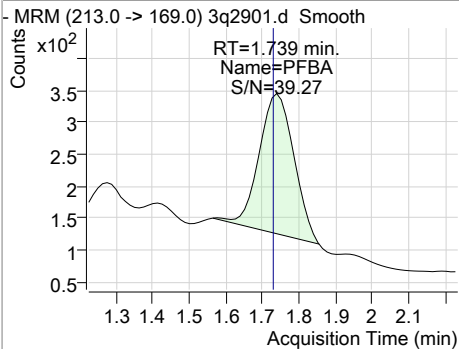
7.4.1

7

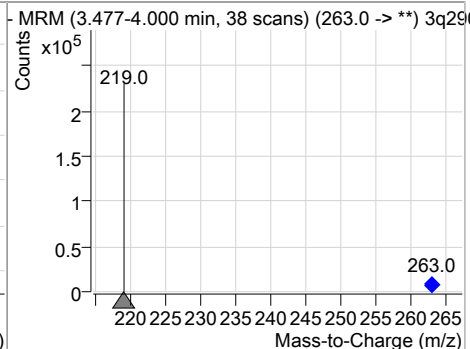
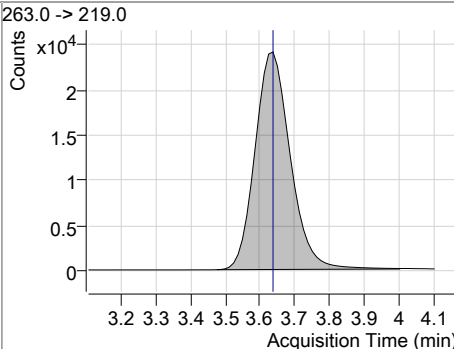
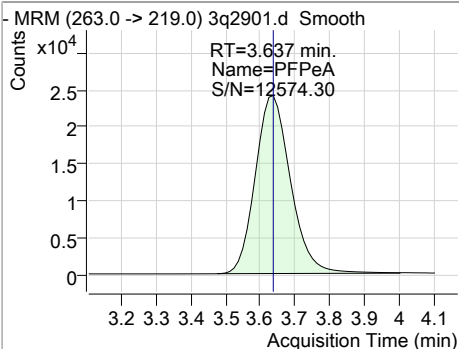
Perfluorinated Compounds by LC/MS/MS



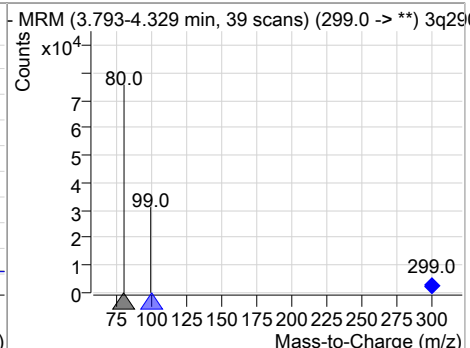
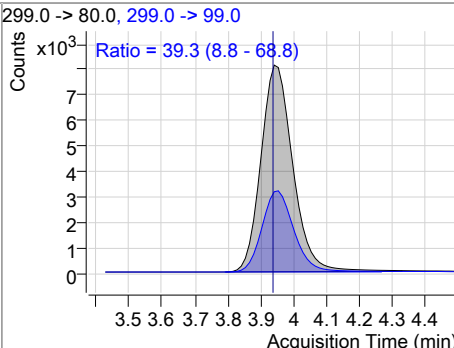
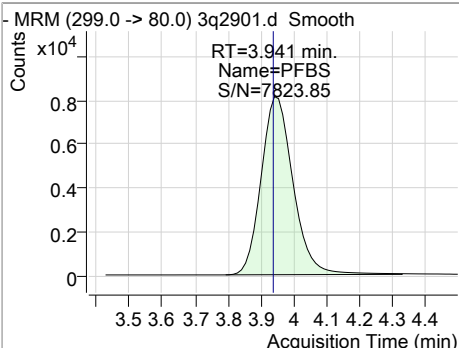
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.47	1.74	0.01	1446				



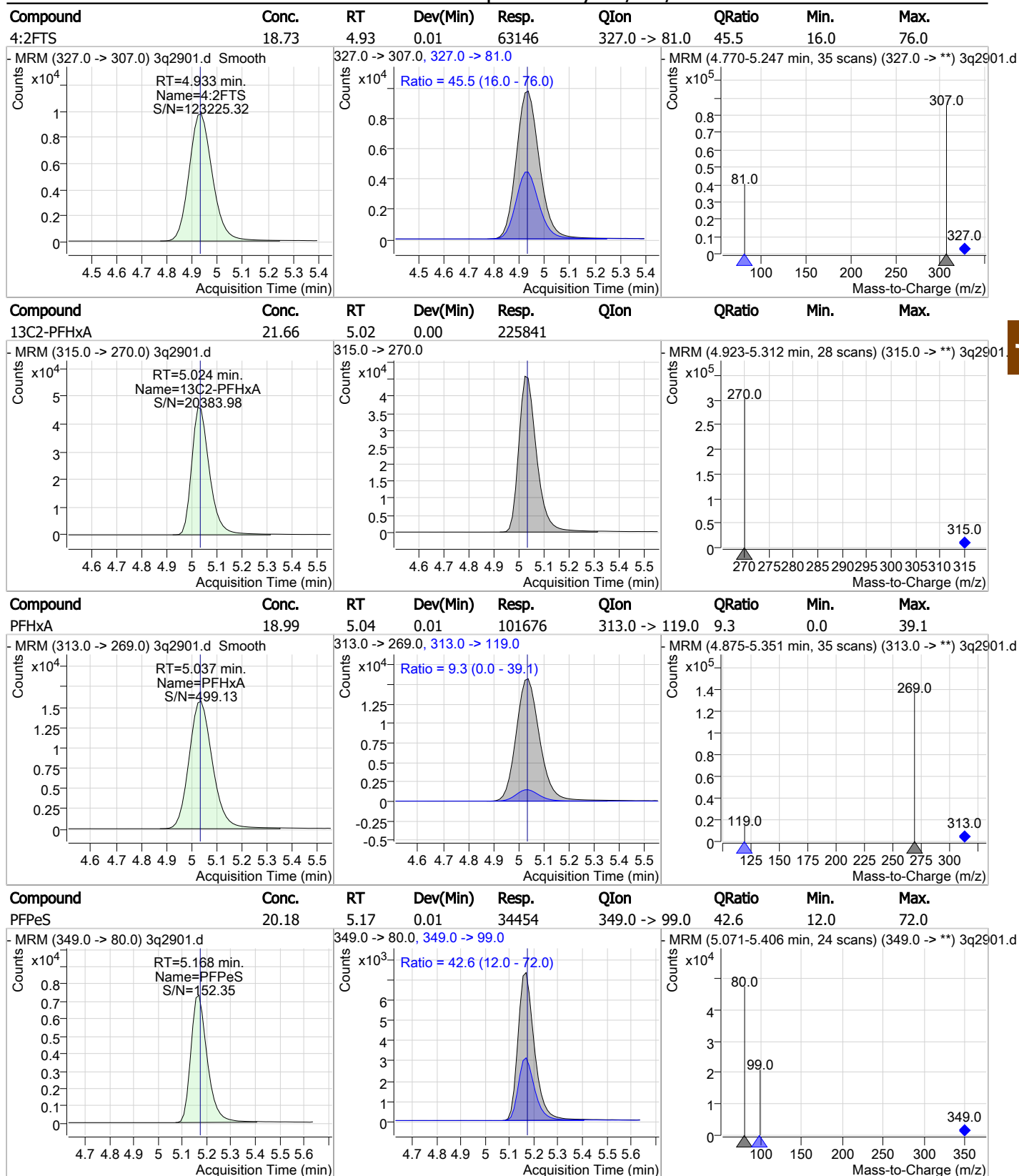
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	18.39	3.64	0.01	169242				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	19.43	3.94	0.01	54681	299.0 -> 99.0	39.3	8.8	68.8

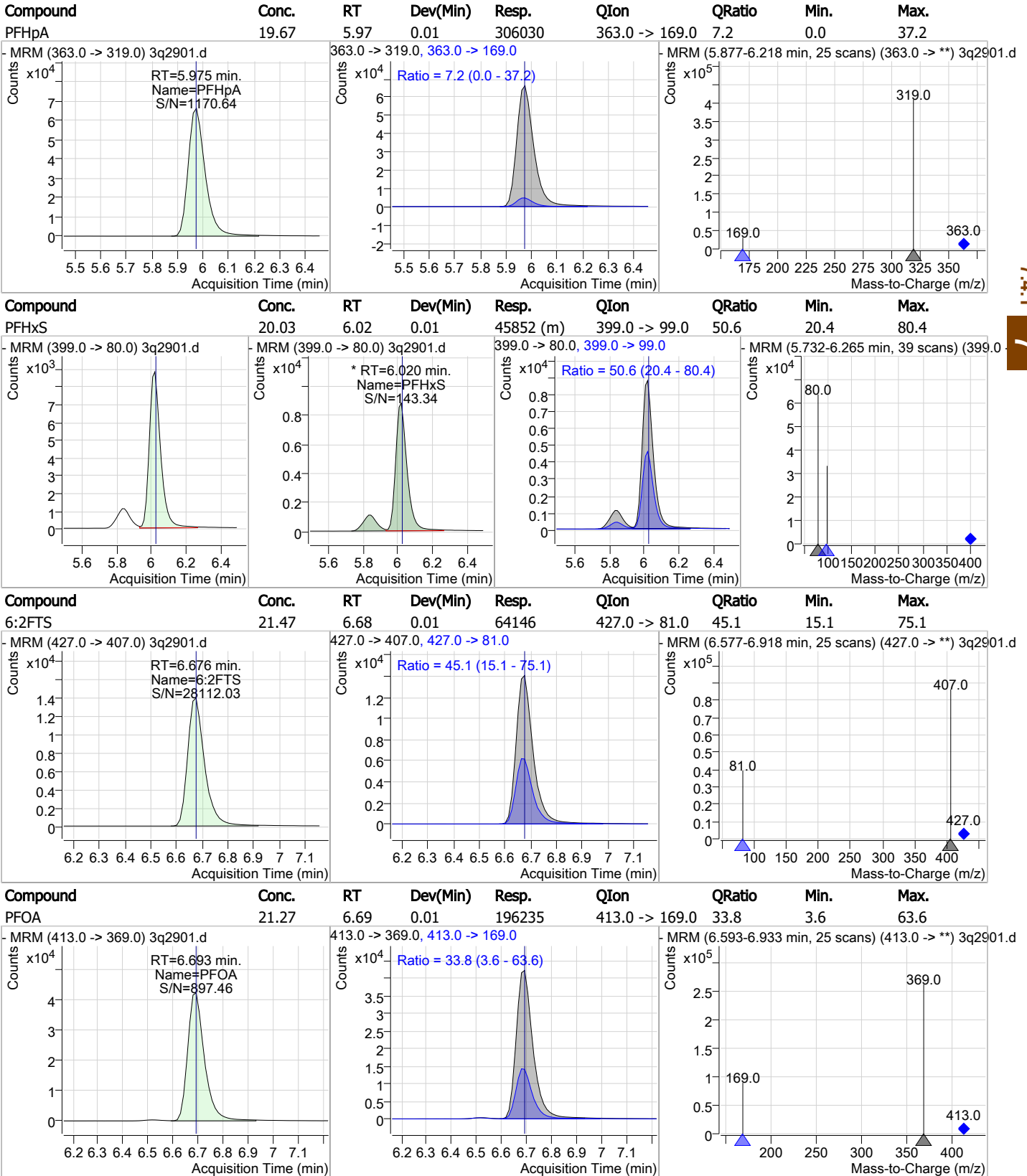


Perfluorinated Compounds by LC/MS/MS



7.4.1
7

Perfluorinated Compounds by LC/MS/MS

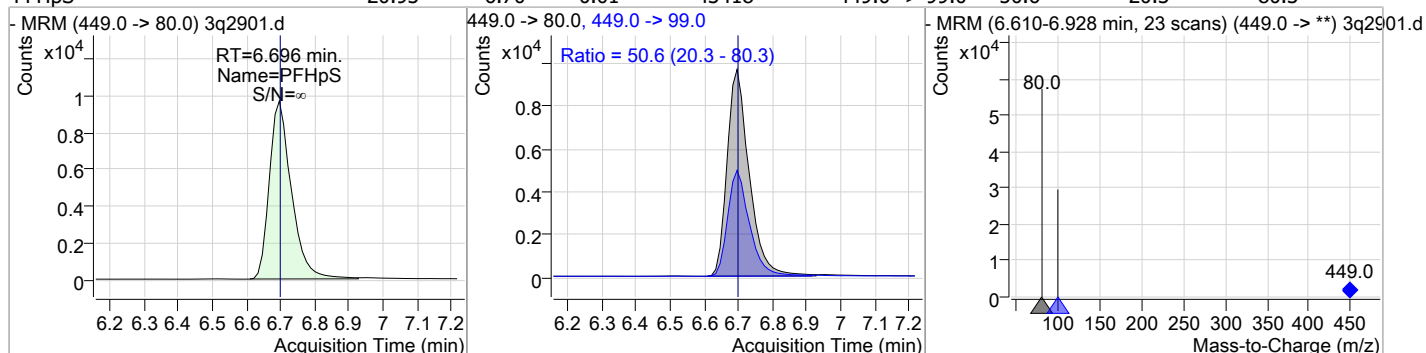


7.4.1

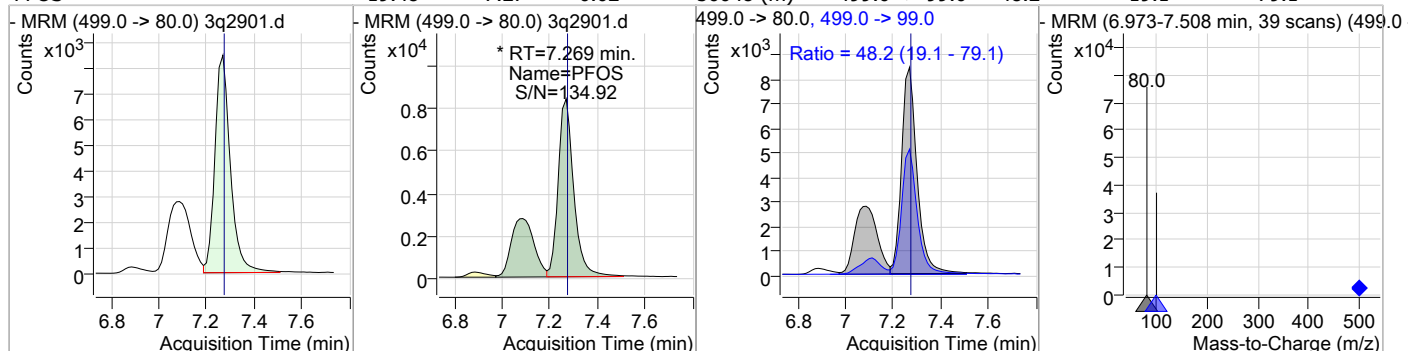
7

Perfluorinated Compounds by LC/MS/MS

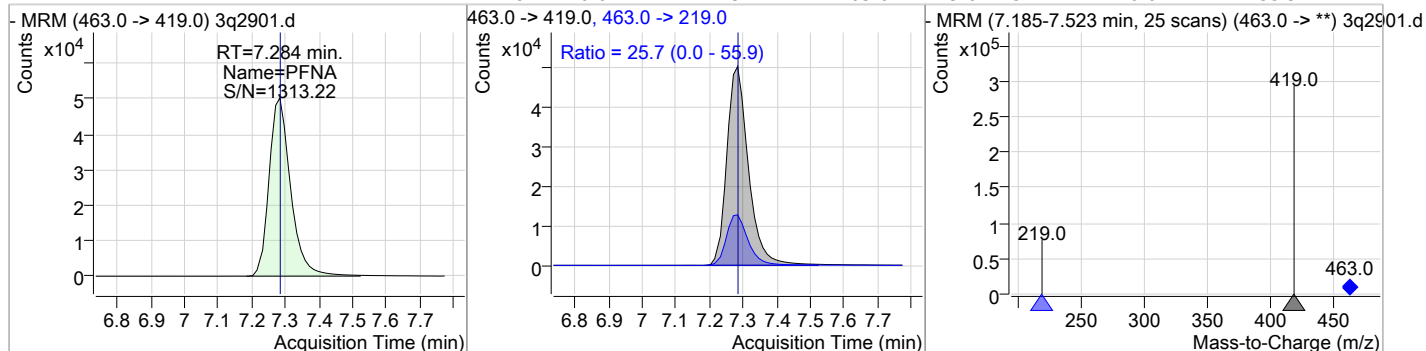
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	20.93	6.70	0.01	43418	449.0 -> 99.0	50.6	20.3	80.3



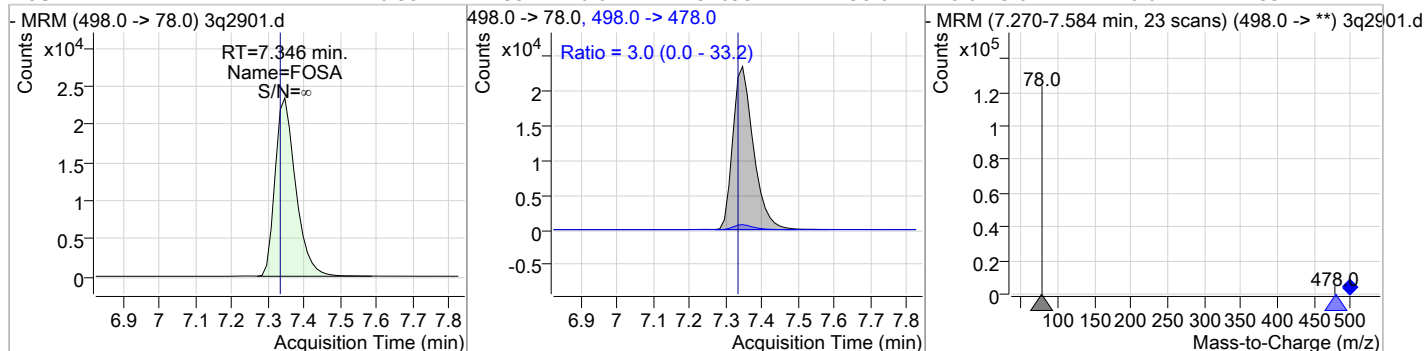
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	19.48	7.27	0.02	56648 (m)	499.0 -> 99.0	48.2	19.1	79.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	21.44	7.28	0.01	222947	463.0 -> 219.0	25.7	0.0	55.9

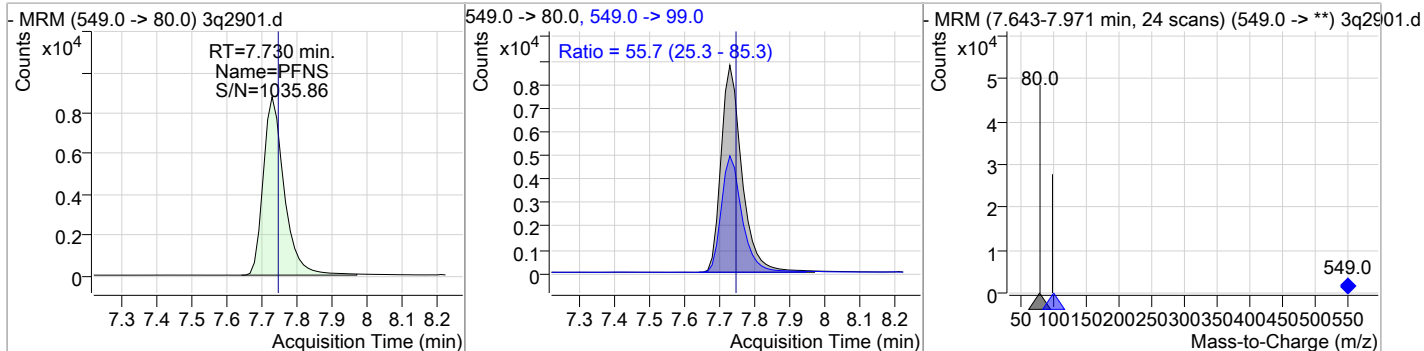


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
FOSA	20.38	7.35	0.01	92095	498.0 -> 478.0	3.0	0.0	33.2

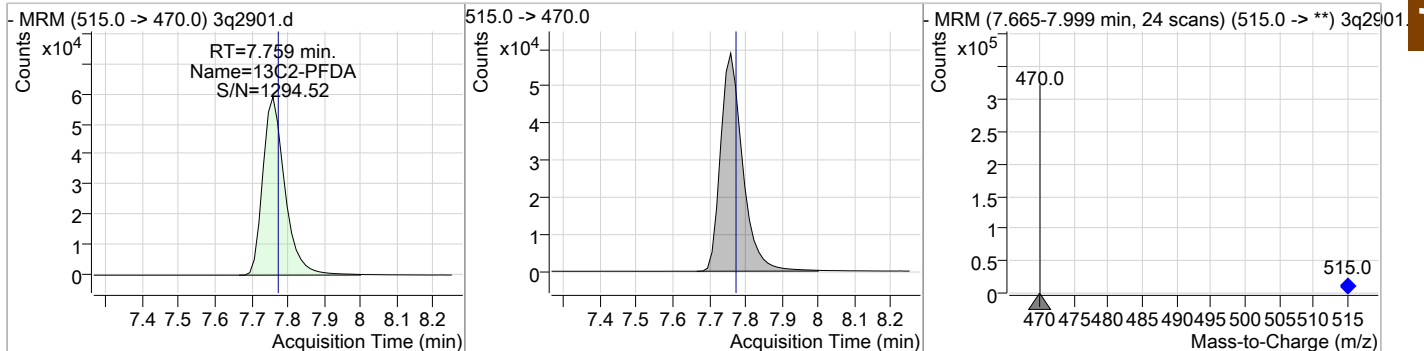


Perfluorinated Compounds by LC/MS/MS

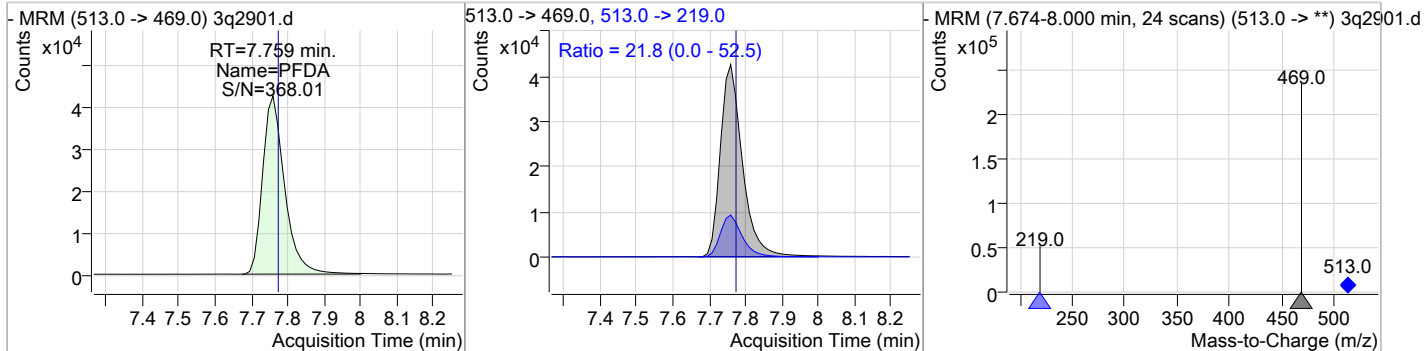
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	19.82	7.73	0.00	36111	549.0 -> 99.0	55.7	25.3	85.3



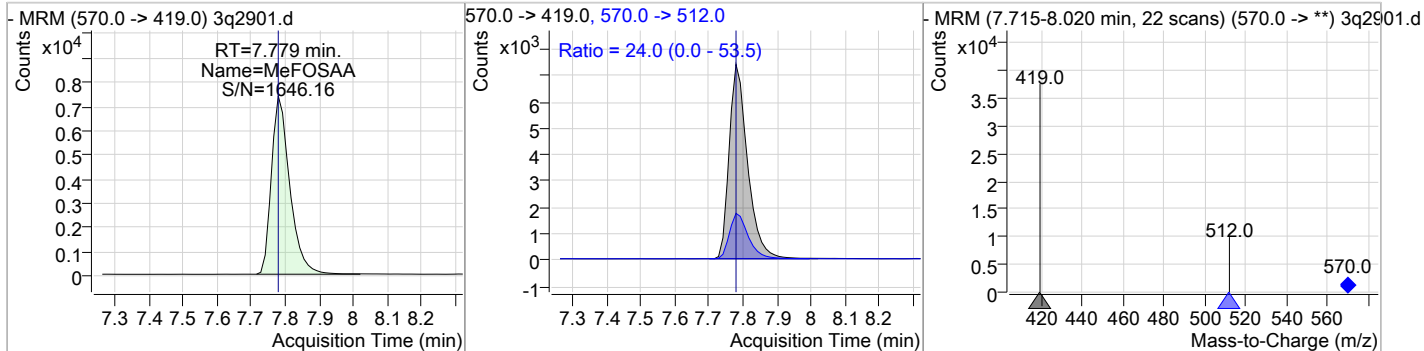
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	21.53	7.76	0.00	246998				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.12	7.76	0.00	178128	513.0 -> 219.0	21.8	0.0	52.5

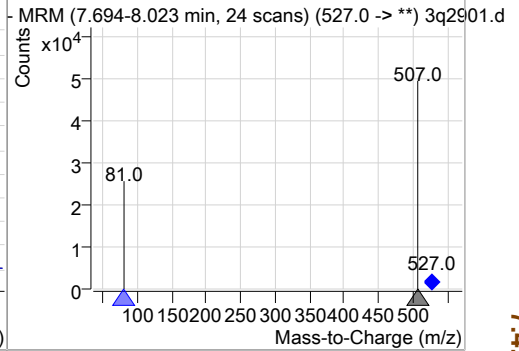
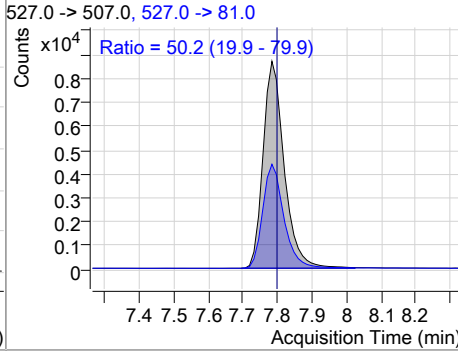
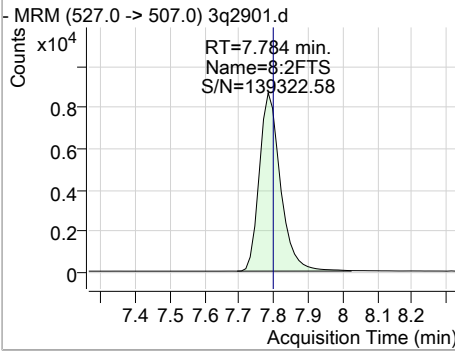


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	18.89	7.78	0.00	27685	570.0 -> 512.0	24.0	0.0	53.5

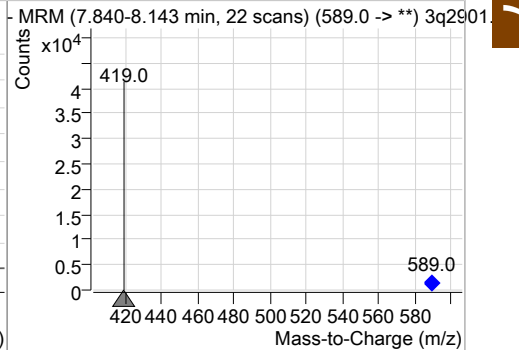
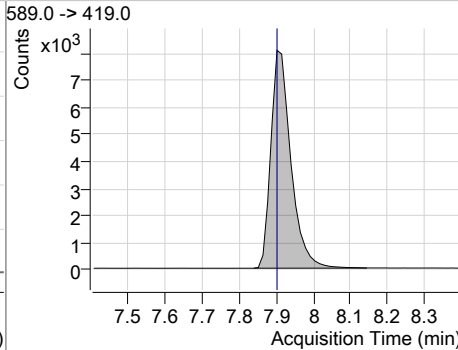
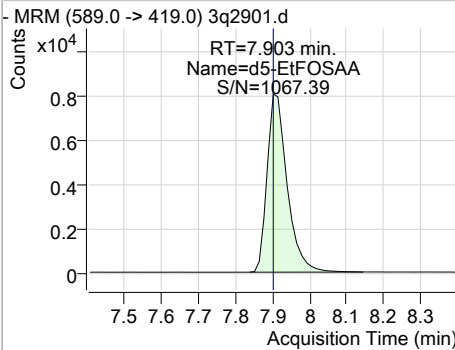


Perfluorinated Compounds by LC/MS/MS

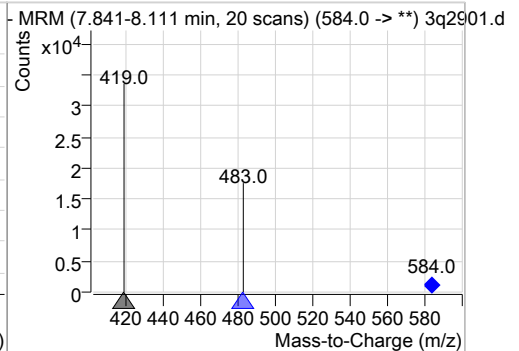
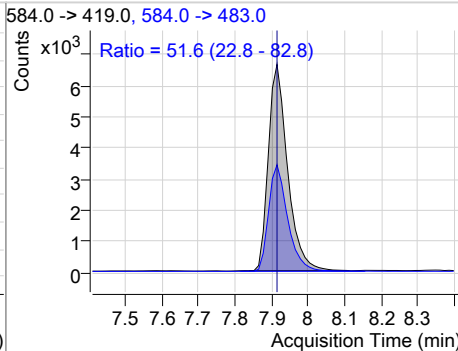
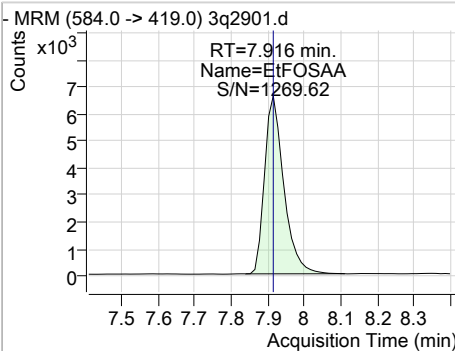
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	18.00	7.78	0.00	36785	527.0 -> 81.0	50.2	19.9	79.9



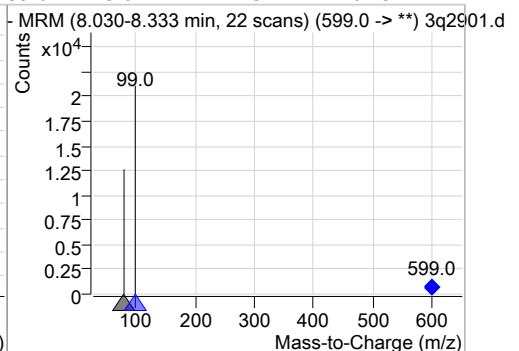
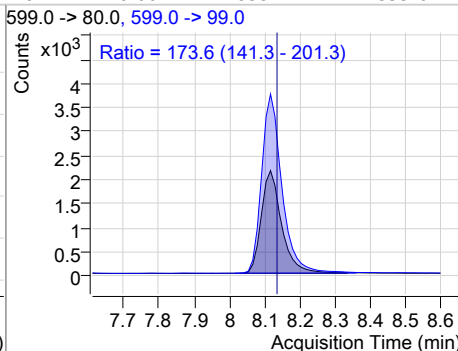
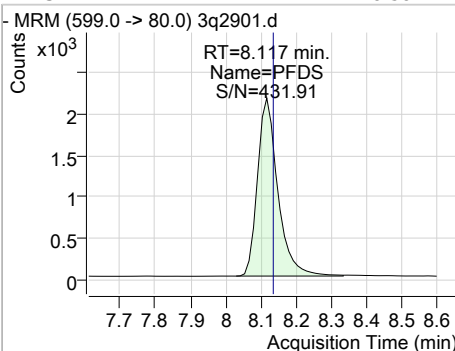
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	19.24	7.90	0.00	30192	589.0 -> 419.0	51.6	22.8	82.8



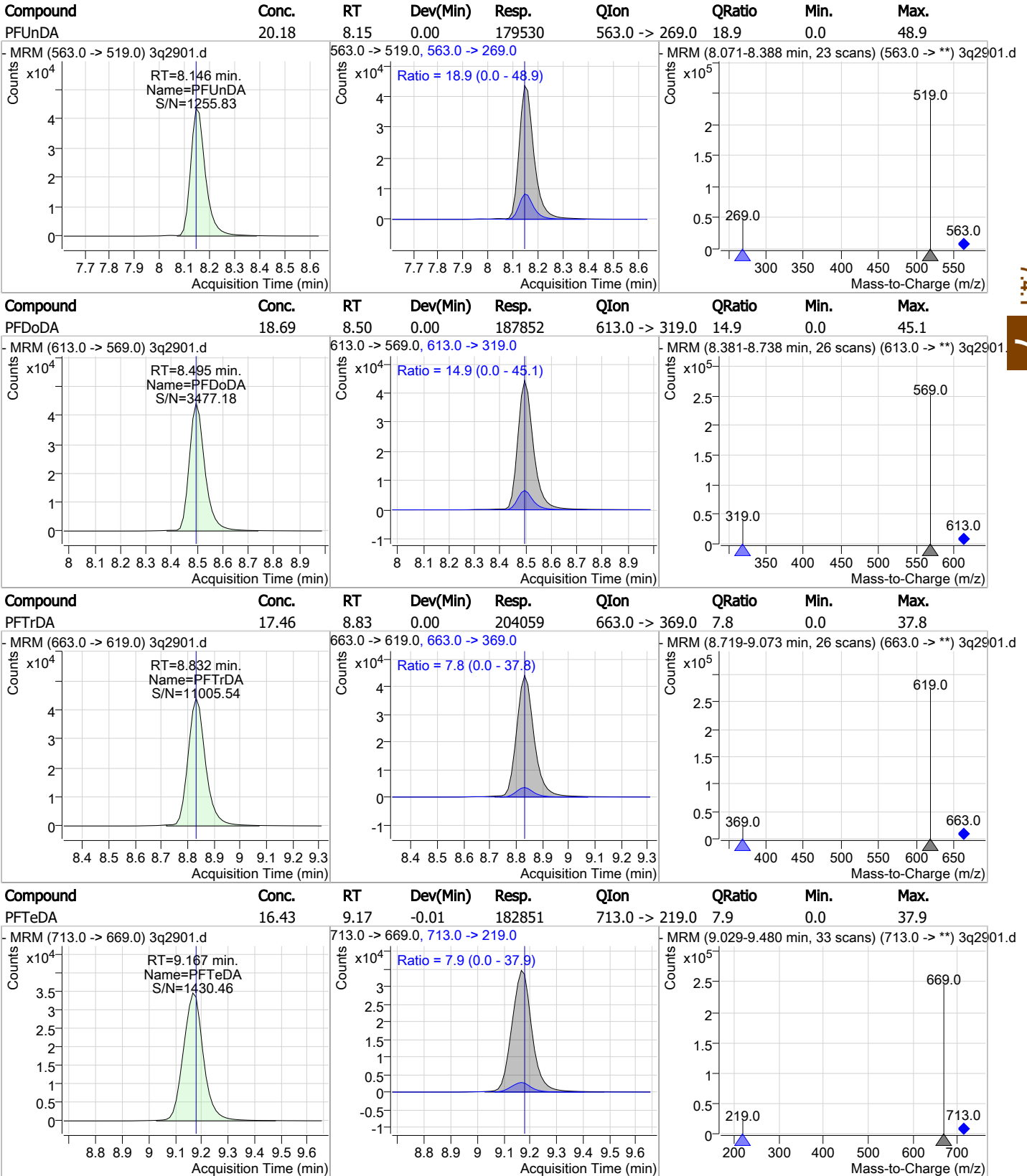
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	19.08	7.92	0.00	24105	584.0 -> 483.0	51.6	22.8	82.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	18.58	8.12	0.00	8554	599.0 -> 99.0	173.6	141.3	201.3



Perfluorinated Compounds by LC/MS/MS



7.4.1
7



Manual Integration Approval Summary

Sample Number: OP74558-MS **Method:** EPA 537 MOD
Lab FileID: 3Q2901.D **Analyst approved:** 04/15/19 09:06 Nancy Saunders
Injection Time: 04/12/19 14:21 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.02	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.27	Split peak

7.4.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2903.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 2:51:55 PM
 Sample Name : op74558-dup
 Vial : P2-C6
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74558,S3Q72,125,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	60081	20.00 µg/L	0.013
13C2-PFDoDA	8.494	615.0 -> 570.0	231992	20.00 µg/L	0.000
13C2-PFOA	6.691	415.0 -> 370.0	230962	20.00 µg/L	0.013
13C3-PFPeA	3.634	266.0 -> 222.0	137889	20.00 µg/L	0.013
13C4-PFOS	7.268	503.0 -> 80.0	50593	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	26663	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	227730	19.62 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 98.1%	
13C2-PFHxA	5.036	315.0 -> 270.0	215684	20.48 µg/L	0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 102.4%	
d5-EtFOSAA	7.903	589.0 -> 419.0	28810	18.62 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 93.1%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
					QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.	
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	-	584.0 -> 419.0	-	N.D.	
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	-	570.0 -> 419.0	-	N.D.	
PFBA	1.739	213.0 -> 169.0	794	0.25 µg/L	100
PFBS	-	299.0 -> 80.0	-	N.D.	
PFDA	-	513.0 -> 469.0	-	N.D.	
PFDoDA	-	613.0 -> 569.0	-	N.D.	
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	-	363.0 -> 319.0	-	N.D.	
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	-	313.0 -> 269.0	-	N.D.	
PFHxS	-	399.0 -> 80.0	-	N.D.	
PFNA	-	463.0 -> 419.0	-	N.D.	
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	-	413.0 -> 369.0	-	N.D.	
PFOS	-	499.0 -> 80.0	-	N.D.	
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	-	713.0 -> 669.0	-	N.D.	
PFTrDA	-	663.0 -> 619.0	-	N.D.	
PFUnDA	-	563.0 -> 519.0	-	N.D.	
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.5.1
7



Perfluorinated Compounds by LC/MS/MS

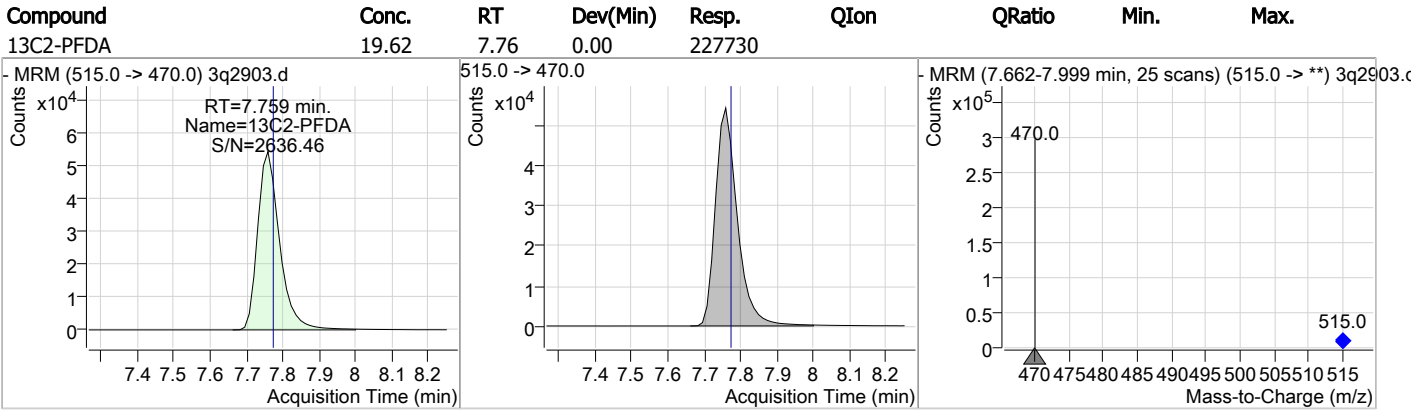
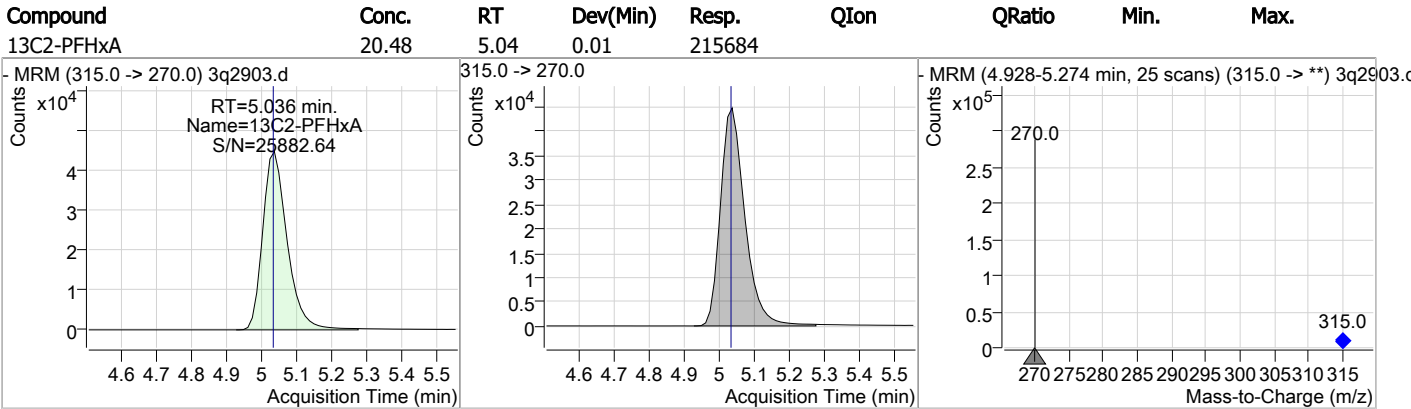
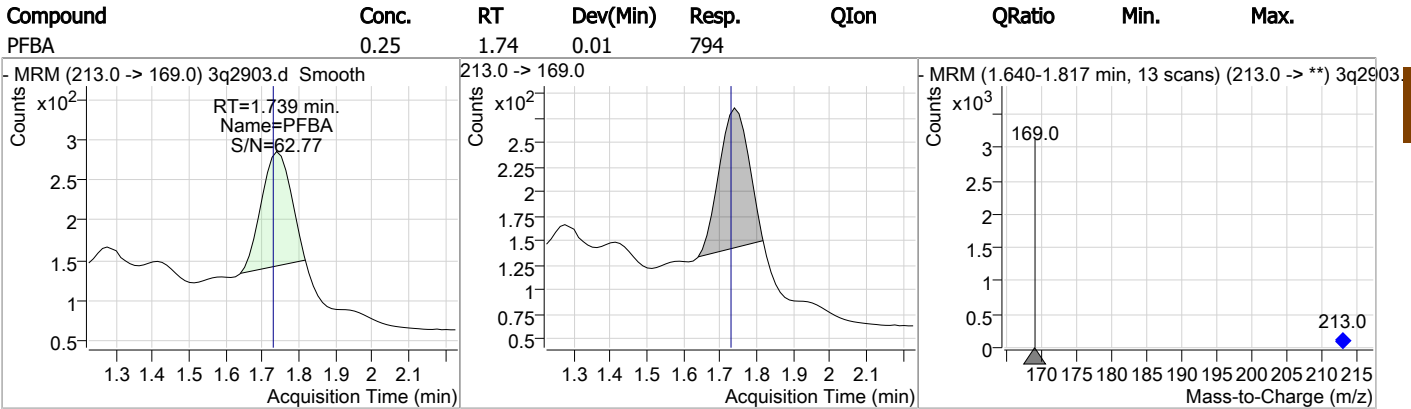
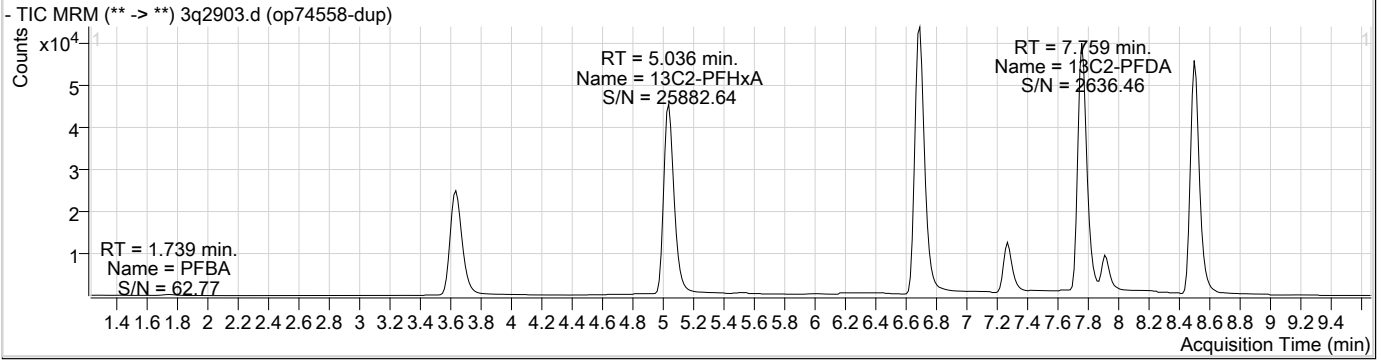
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.5.1

7

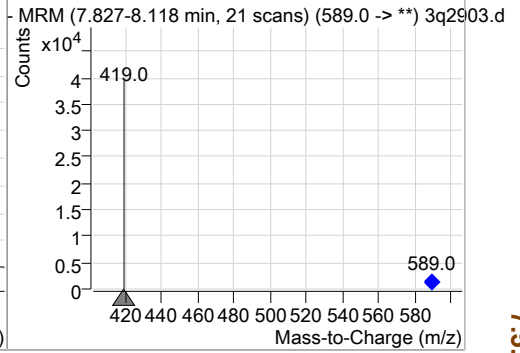
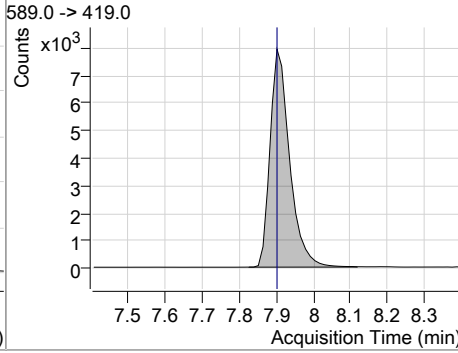
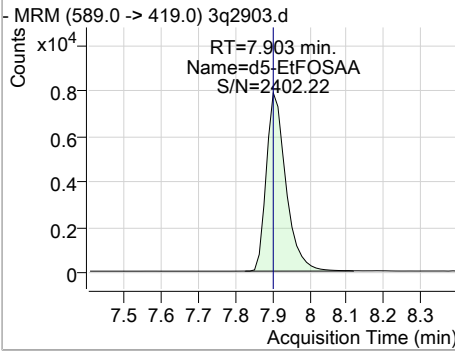
Perfluorinated Compounds by LC/MS/MS



7.5.1
7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	18.62	7.90	0.00	28810				



7.5.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2810.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 2:54:53 PM
 Sample Name : ic72-0.5
 Vial : P1-A2
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	53299	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	238635	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	229724	20.00 µg/L	0.000
13C3-PFPeA	3.596	266.0 -> 222.0	157112	20.00 µg/L	-0.025
13C4-PFOS	7.252	503.0 -> 80.0	58375	20.00 µg/L	0.000
d3-MeFOSAA	7.765	573.0 -> 419.0	29129	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	7357	0.63 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 3.2%		
13C2-PFHxA	5.011	315.0 -> 270.0	6208	0.60 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 3.0%		
d5-EtFOSAA	7.903	589.0 -> 419.0	981	0.58 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 2.9%		
13C3-HFPO-DA	5.316	287.0 -> 169.0	2154	3.01 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = 3.0%		
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	1789	0.62 µg/L	QValue 96
6:2FTS	6.663	427.0 -> 407.0	1625	0.64 µg/L	96
8:2FTS	7.770	527.0 -> 507.0	1176	0.67 µg/L	93
EtFOSAA	7.903	584.0 -> 419.0	869	0.65 µg/L	89
FOSA	7.333	498.0 -> 78.0	2978	0.62 µg/L	98
MeFOSAA	7.766	570.0 -> 419.0	940	0.60 µg/L	99
PFBA	1.726	213.0 -> 169.0	1708	0.55 µg/L	100
PFBS	3.916	299.0 -> 80.0	1764	0.57 µg/L	100
PFDA	7.747	513.0 -> 469.0	5713	0.64 µg/L	98
PFDoDA	8.495	613.0 -> 569.0	6051	0.58 µg/L	99
PFDS	8.117	599.0 -> 80.0	316	0.62 µg/L	88
PFHpA	5.950	363.0 -> 319.0	8676	0.55 µg/L	98
PFHpS	6.684	449.0 -> 80.0	1334	0.58 µg/L	96
PFHxA	5.012	313.0 -> 269.0	3164	0.59 µg/L	100
PFHxS	6.007	399.0 -> 80.0	1417	0.56 µg/L	m 95
PFNA	7.272	463.0 -> 419.0	6507	0.62 µg/L	97
PFNS	7.717	549.0 -> 80.0	1262	0.63 µg/L	94
PFOA	6.668	413.0 -> 369.0	5588	0.60 µg/L	96
PFOS	7.253	499.0 -> 80.0	1897	0.59 µg/L	m 97
PFPeA	3.600	263.0 -> 219.0	5943	0.59 µg/L	100
PFPeS	5.143	349.0 -> 80.0	1159	0.62 µg/L	91
PFTeDA	9.167	713.0 -> 669.0	6293	0.54 µg/L	99
PFTrDA	8.832	663.0 -> 619.0	6714	0.55 µg/L	99
PFUnDA	8.146	563.0 -> 519.0	6077	0.66 µg/L	97
ADONA	6.061	377.0 -> 251.0	11559	0.56 µg/L	100
9Cl-PF3ONS	7.504	531.0 -> 351.0	1055	0.53 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	4606	0.56 µg/L	100
HFPO-DA	5.308	329.0 -> 169.0	7600	3.14 µg/L	100

7.6.1
7

Perfluorinated Compounds by LC/MS/MS

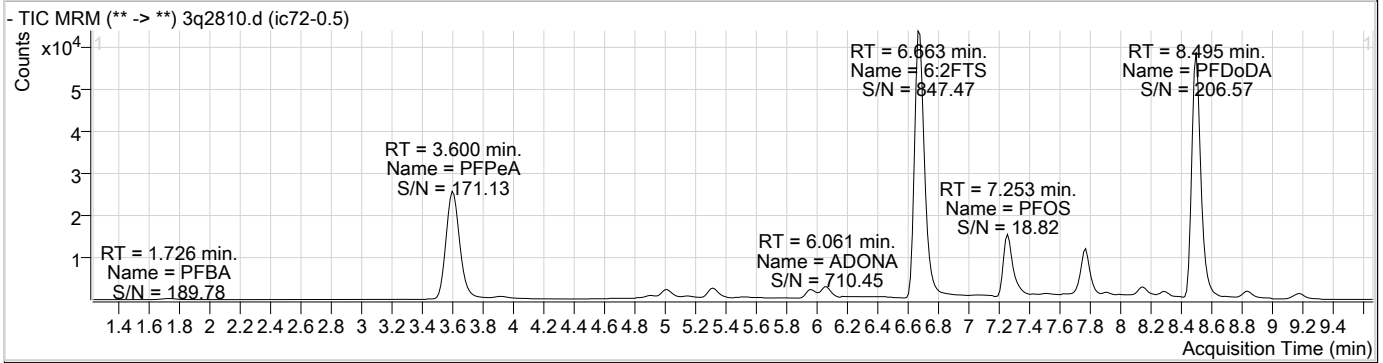
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

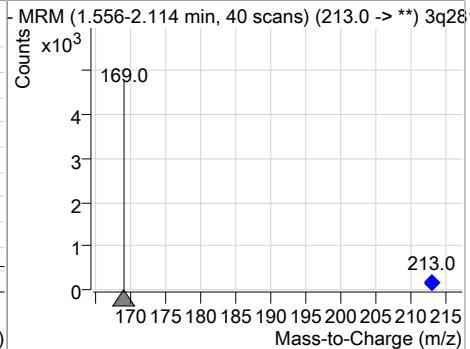
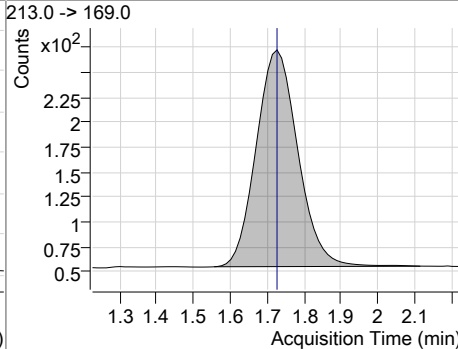
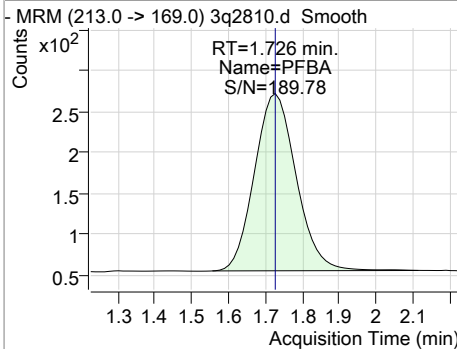
7.6.1

7

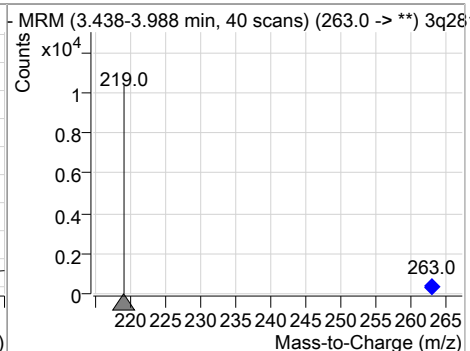
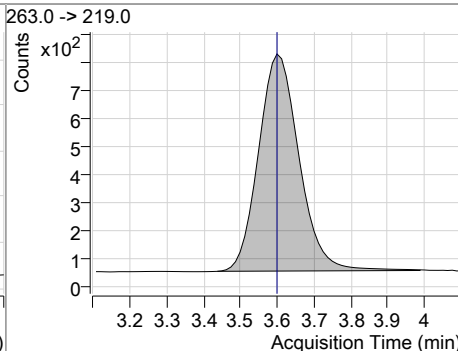
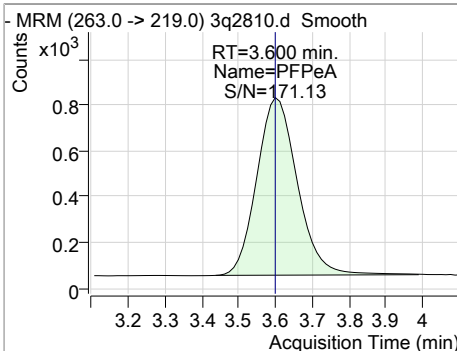
Perfluorinated Compounds by LC/MS/MS



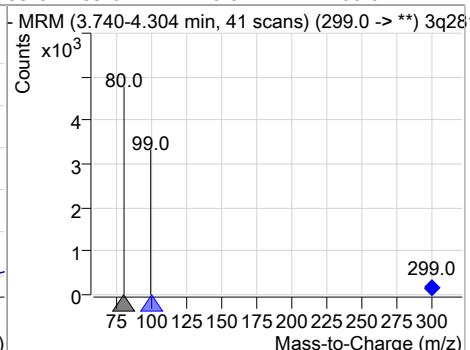
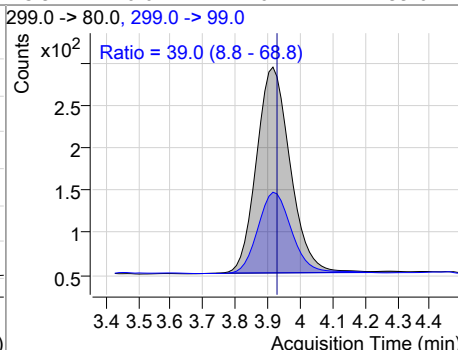
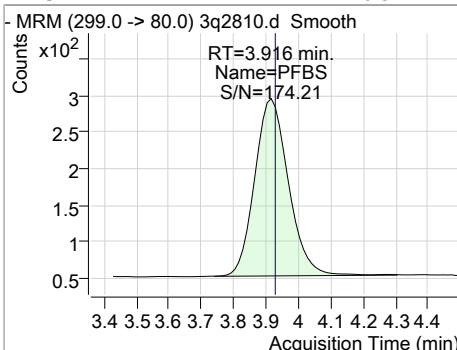
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.55	1.73	0.00	1708				



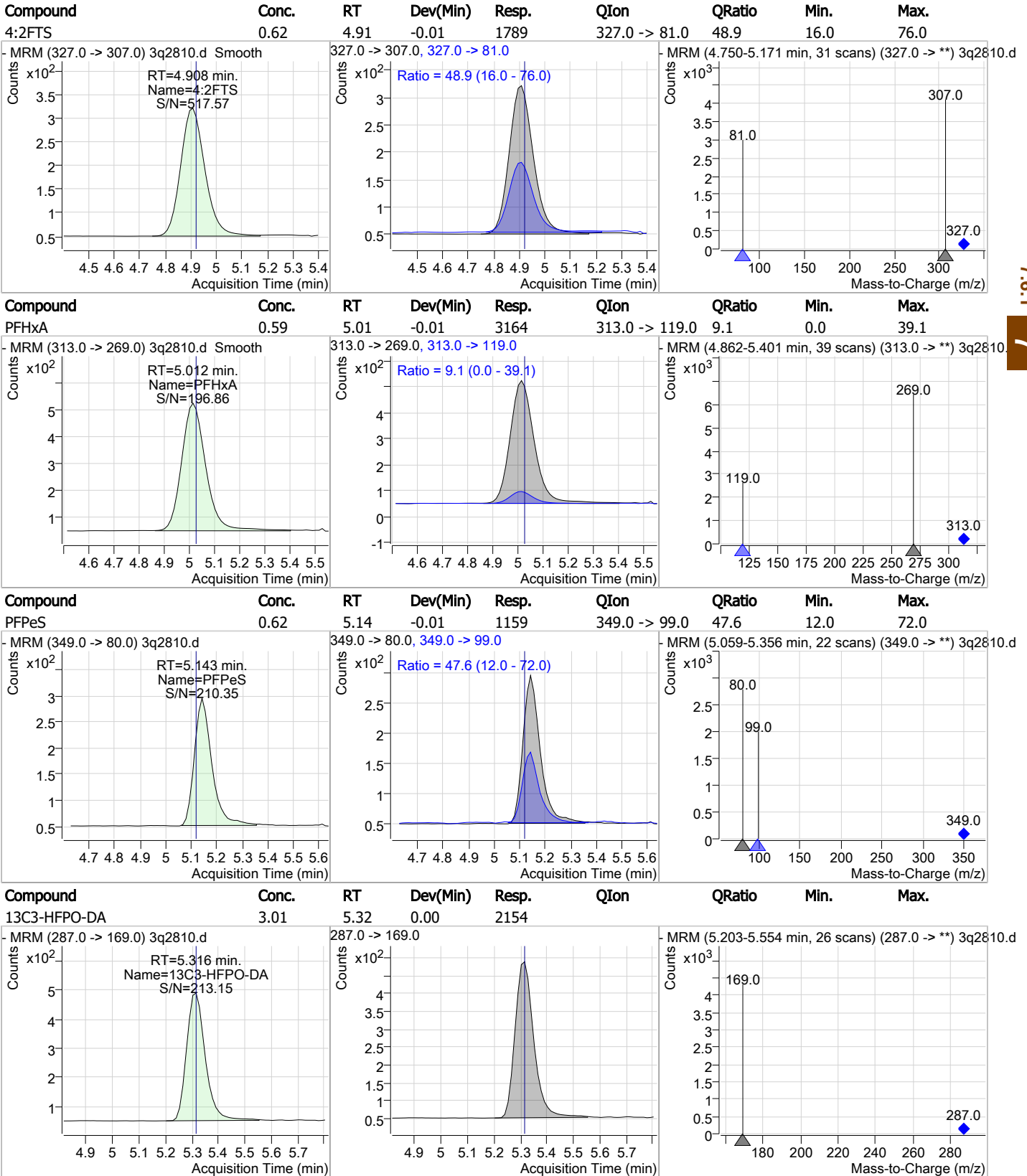
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	0.59	3.60	-0.03	5943				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	0.57	3.92	-0.01	1764	299.0 -> 99.0	39.0	8.8	68.8



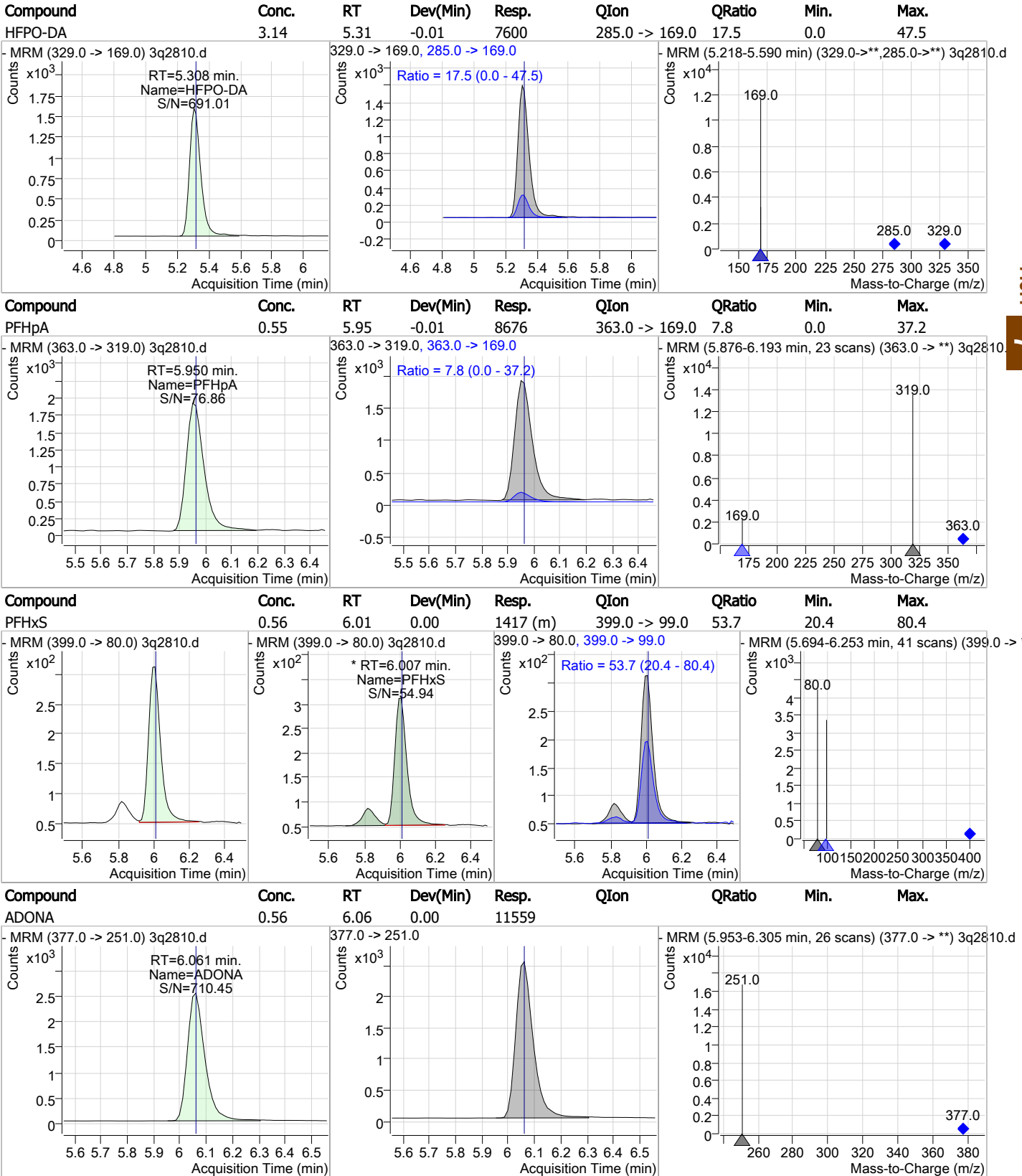
Perfluorinated Compounds by LC/MS/MS



7.6.1

7

Perfluorinated Compounds by LC/MS/MS



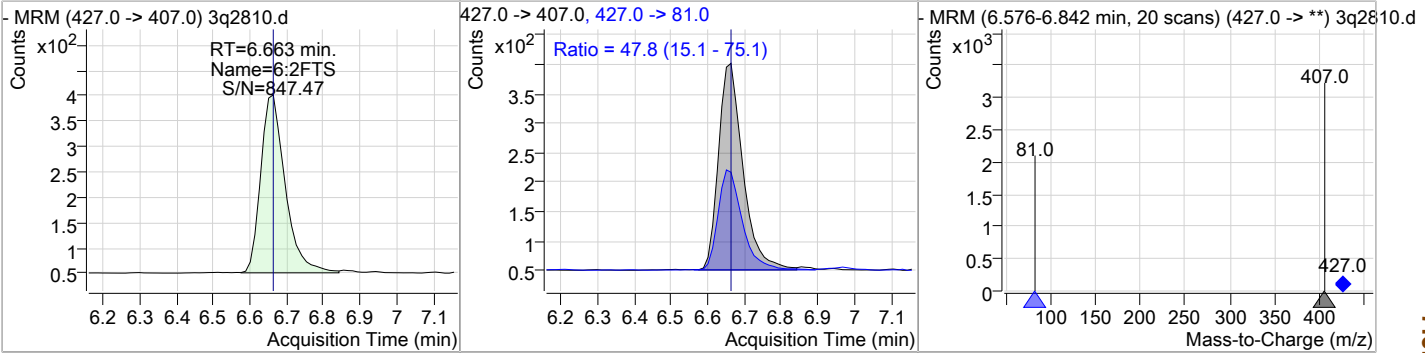
7.6.1

7

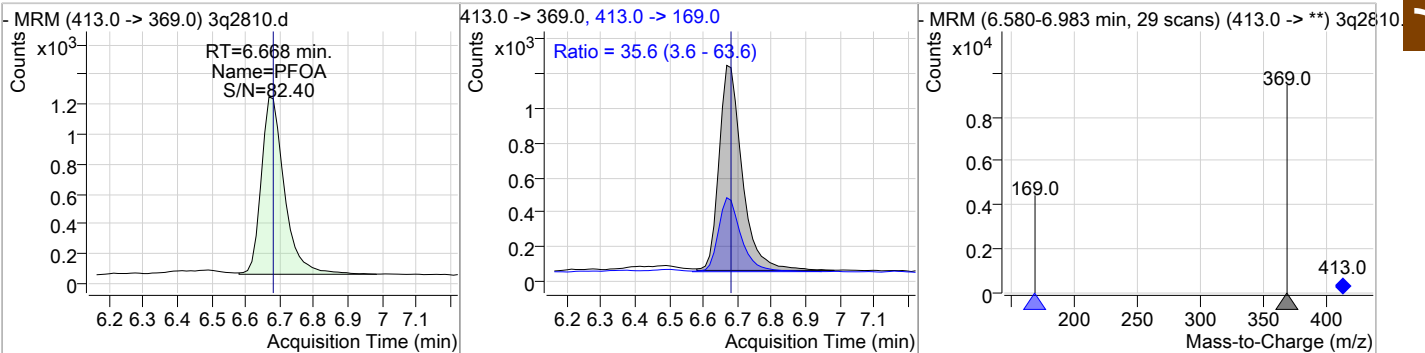


Perfluorinated Compounds by LC/MS/MS

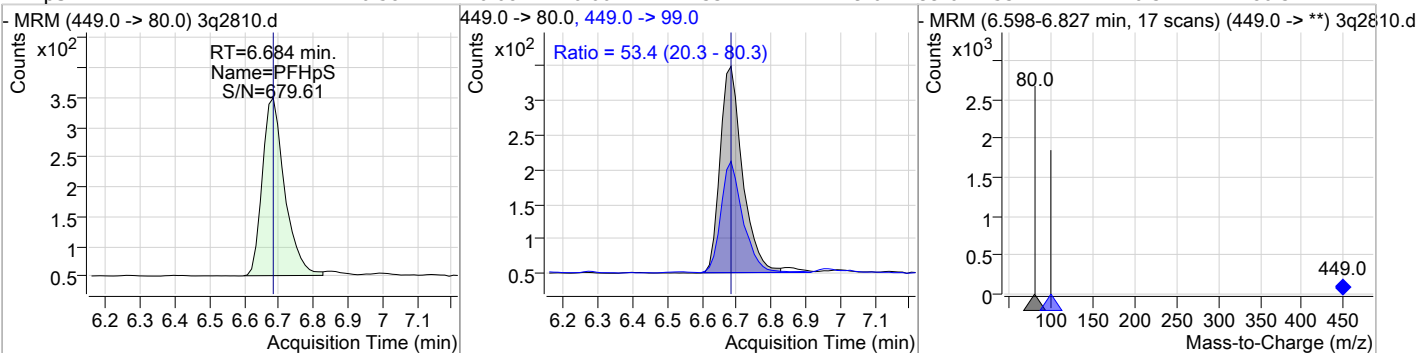
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
6:2FTS	0.64	6.66	0.00	1625	427.0 -> 81.0	47.8	15.1	75.1



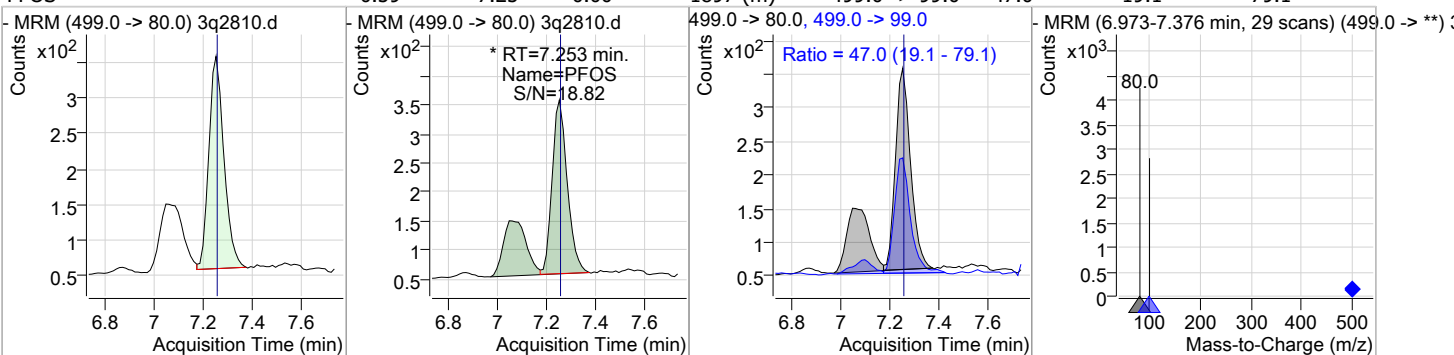
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	0.60	6.67	-0.01	5588	413.0 -> 169.0	35.6	3.6	63.6



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpS	0.58	6.68	0.00	1334	449.0 -> 99.0	53.4	20.3	80.3

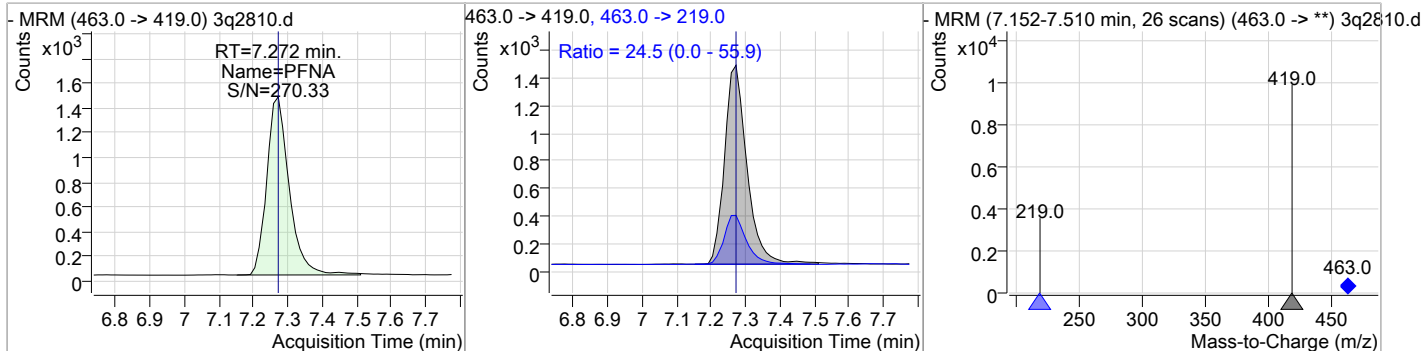


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	0.59	7.25	0.00	1897 (m)	499.0 -> 99.0	47.0	19.1	79.1

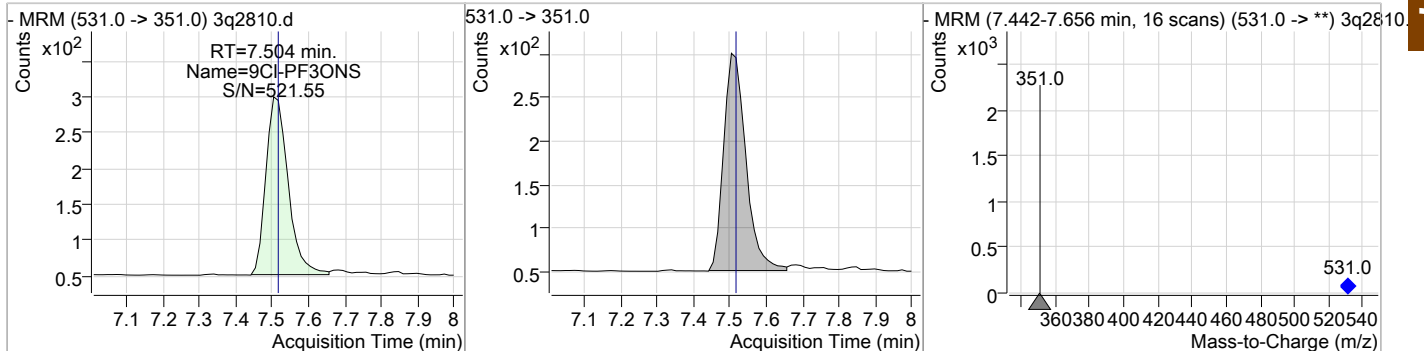


Perfluorinated Compounds by LC/MS/MS

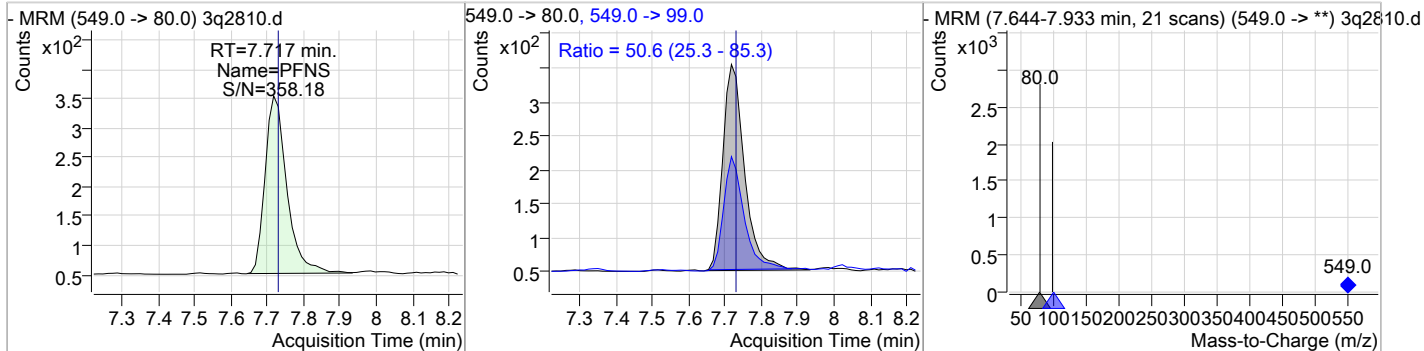
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	0.62	7.27	0.00	6507	463.0 -> 219.0	24.5	0.0	55.9



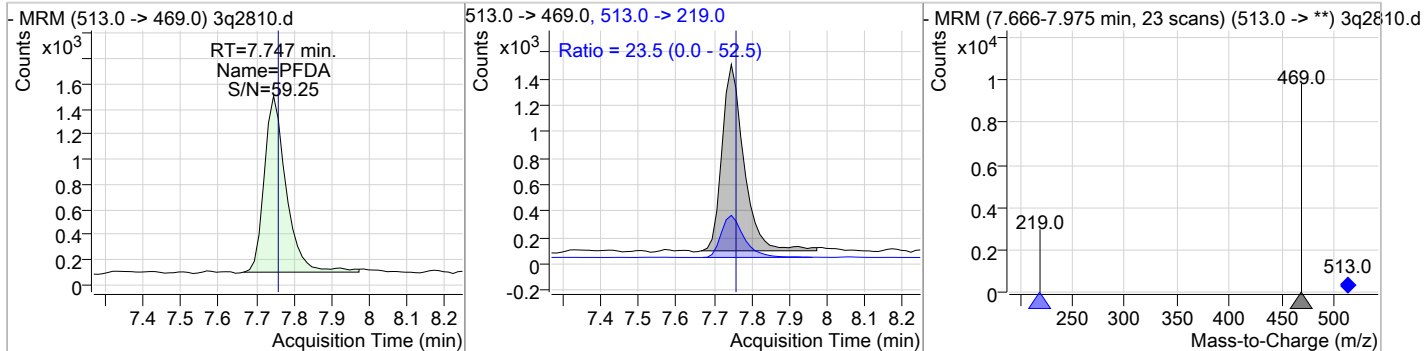
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9Cl-PF3ONS	0.53	7.50	-0.01	1055				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	0.63	7.72	-0.01	1262	549.0 -> 99.0	50.6	25.3	85.3



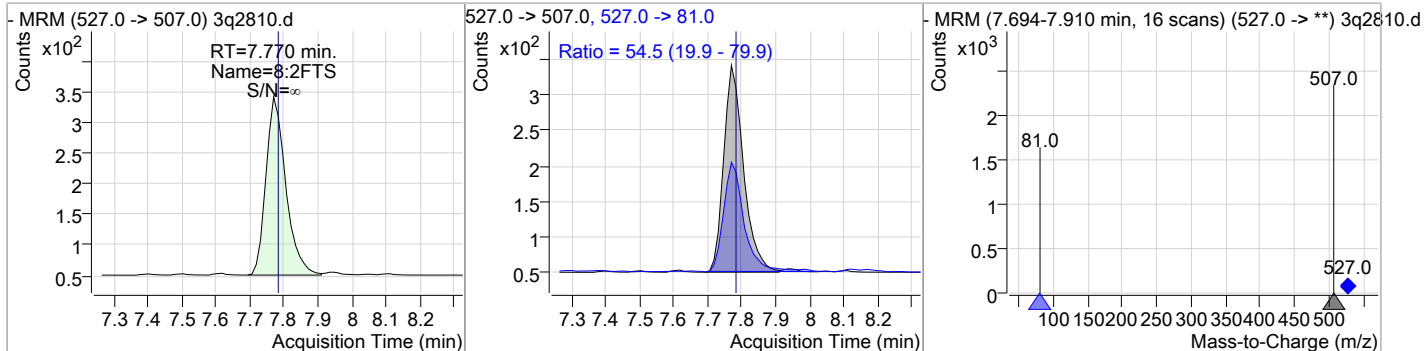
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	0.64	7.75	-0.01	5713	513.0 -> 219.0	23.5	0.0	52.5



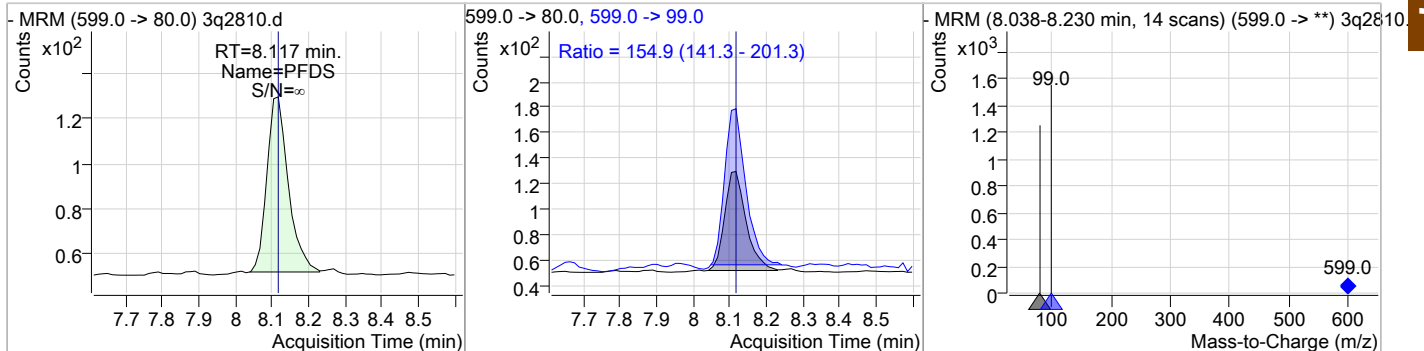
7.6.1

Perfluorinated Compounds by LC/MS/MS

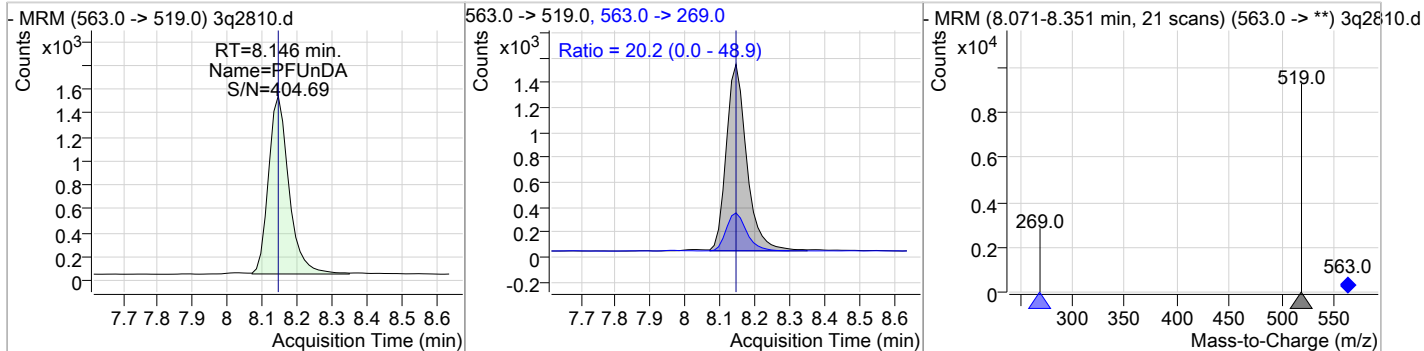
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	0.67	7.77	-0.01	1176	527.0 -> 81.0	54.5	19.9	79.9



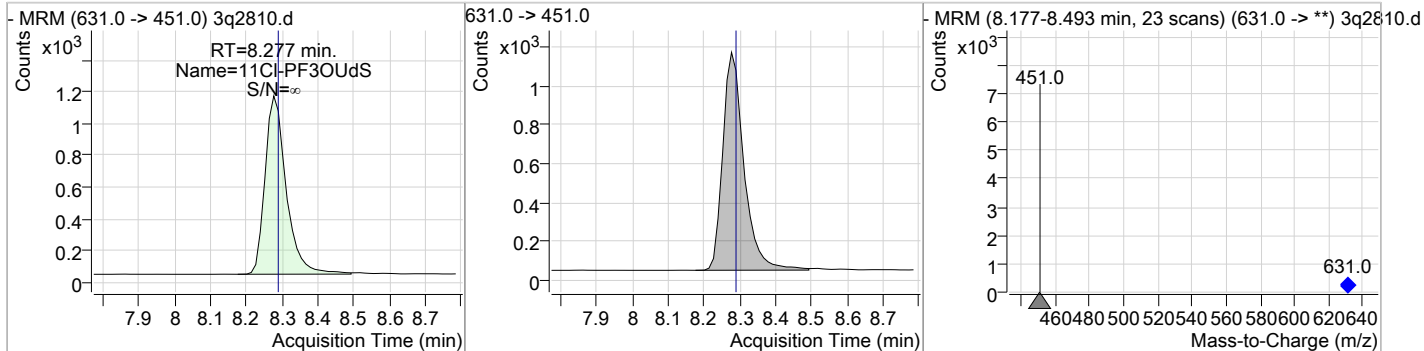
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	0.62	8.12	0.00	316	599.0 -> 99.0	154.9	141.3	201.3



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	0.66	8.15	0.00	6077	563.0 -> 269.0	20.2	0.0	48.9

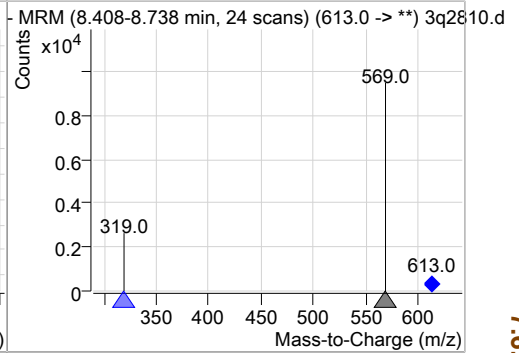
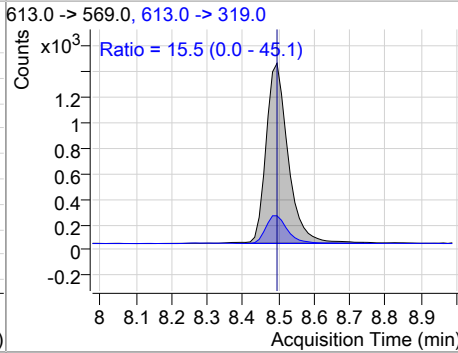
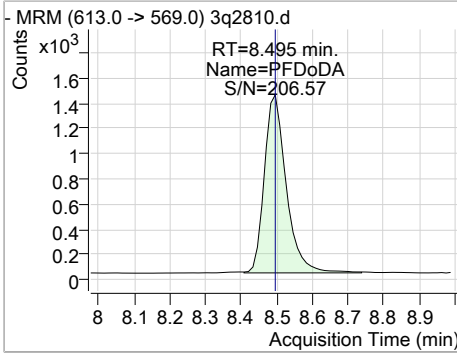


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	0.56	8.28	-0.01	4606	631.0 -> 451.0			

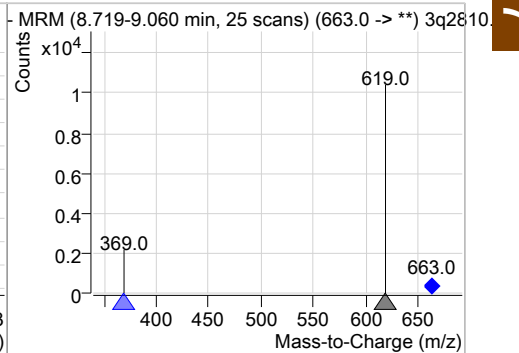
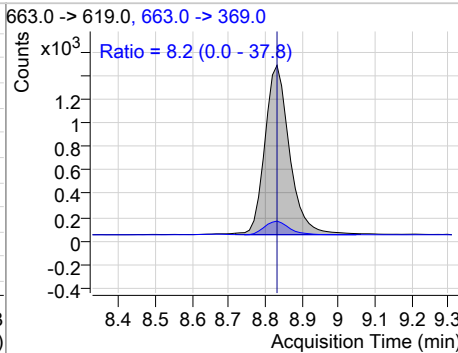
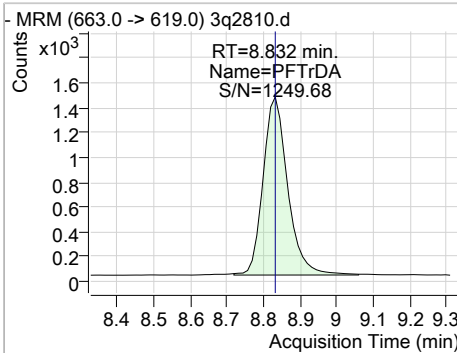


Perfluorinated Compounds by LC/MS/MS

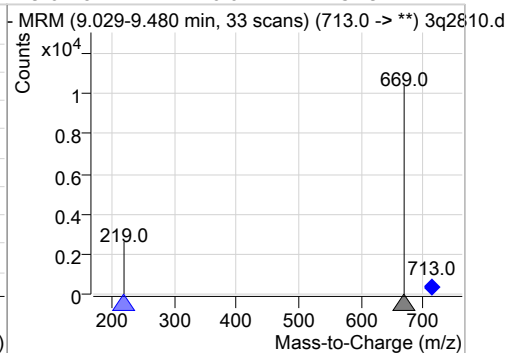
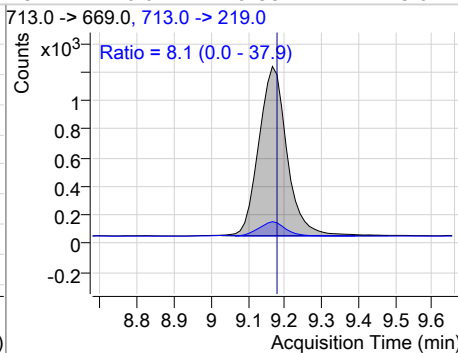
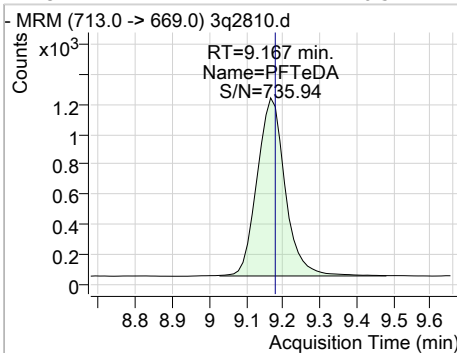
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	0.58	8.50	0.00	6051	613.0 -> 319.0	15.5	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	0.55	8.83	0.00	6714	663.0 -> 369.0	8.2	0.0	37.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	0.54	9.17	-0.01	6293	713.0 -> 219.0	8.1	0.0	37.9



7.6.1

7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2810.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 14:54 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.1.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2811.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 3:10:13 PM
 Sample Name : ic72-1.0
 Vial : P1-A3
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	51931	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	247576	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	222936	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	151765	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	56249	20.00 µg/L	0.000
d3-MeFOSAA	7.765	573.0 -> 419.0	27797	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	12099	1.07 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 5.4%		
13C2-PFHxA	5.011	315.0 -> 270.0	10321	1.03 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 5.2%		
d5-EtFOSAA	7.903	589.0 -> 419.0	1623	1.01 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 5.0%		
13C3-HFPO-DA	5.303	287.0 -> 169.0	3767	5.43 µg/L	-0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = 5.4%		
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	3059	1.09 µg/L	QValue 99
6:2FTS	6.663	427.0 -> 407.0	2776	1.11 µg/L	98
8:2FTS	7.784	527.0 -> 507.0	1716	1.01 µg/L	85
EtFOSAA	7.903	584.0 -> 419.0	1340	1.05 µg/L	100
FOSA	7.333	498.0 -> 78.0	4976	1.08 µg/L	99
MeFOSAA	7.779	570.0 -> 419.0	1609	1.07 µg/L	100
PFBA	1.726	213.0 -> 169.0	2861	0.95 µg/L	100
PFBS	3.916	299.0 -> 80.0	2988	1.00 µg/L	99
PFDA	7.747	513.0 -> 469.0	9685	1.12 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	11137	1.03 µg/L	98
PFDS	8.117	599.0 -> 80.0	525	1.07 µg/L	99
PFHpA	5.950	363.0 -> 319.0	14494	0.95 µg/L	99
PFHpS	6.684	449.0 -> 80.0	2241	1.02 µg/L	97
PFHxA	5.012	313.0 -> 269.0	4911	0.94 µg/L	98
PFHxS	5.995	399.0 -> 80.0	2504	1.03 µg/L	m 100
PFNA	7.272	463.0 -> 419.0	10152	1.00 µg/L	99
PFNS	7.730	549.0 -> 80.0	1985	1.03 µg/L	93
PFOA	6.681	413.0 -> 369.0	9096	1.01 µg/L	99
PFOS	7.253	499.0 -> 80.0	3134	1.02 µg/L	m 95
PFPeA	3.612	263.0 -> 219.0	9844	1.01 µg/L	100
PFPeS	5.143	349.0 -> 80.0	1890	1.04 µg/L	98
PFTeDA	9.167	713.0 -> 669.0	12121	1.01 µg/L	99
PFTrDA	8.832	663.0 -> 619.0	12789	1.01 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	10376	1.08 µg/L	99
ADONA	6.061	377.0 -> 251.0	19217	0.96 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	1867	0.97 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	7544	0.95 µg/L	100
HFPO-DA	5.308	329.0 -> 169.0	12538	5.34 µg/L	99

7.6.2
7



Perfluorinated Compounds by LC/MS/MS

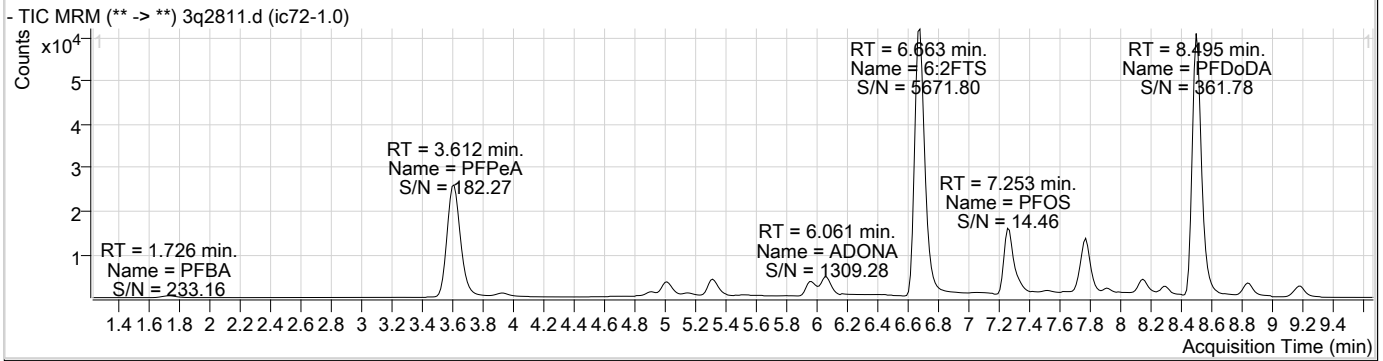
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

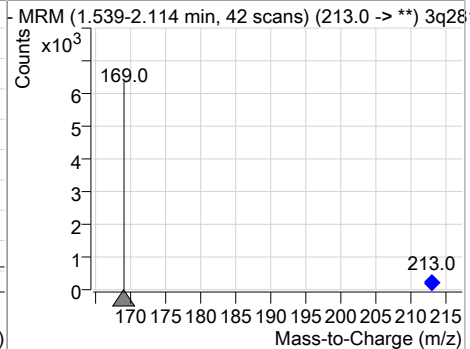
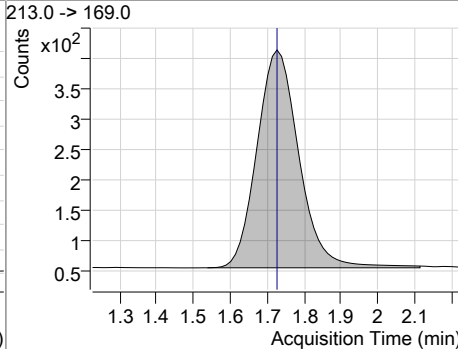
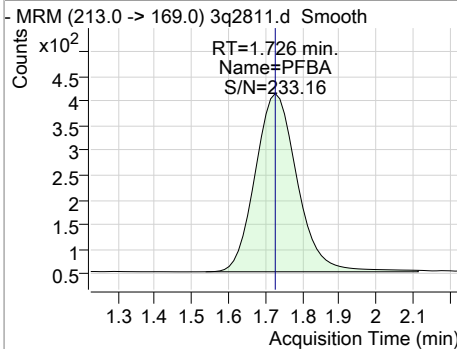
7.6.2

7

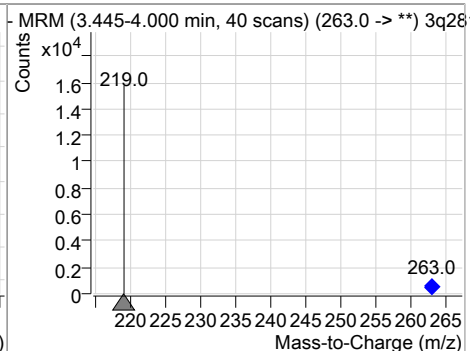
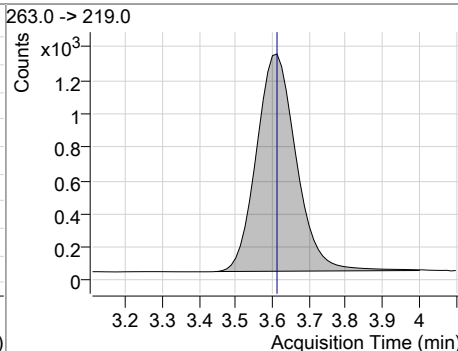
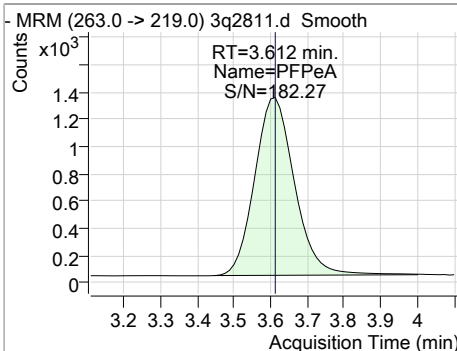
Perfluorinated Compounds by LC/MS/MS



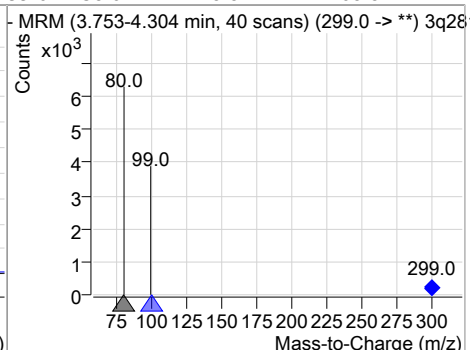
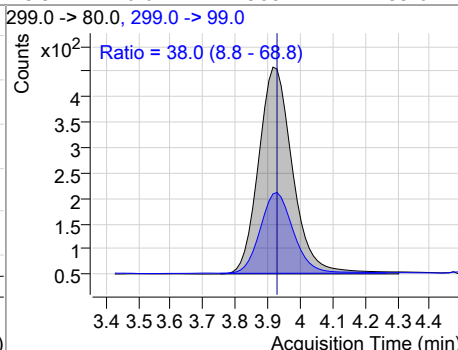
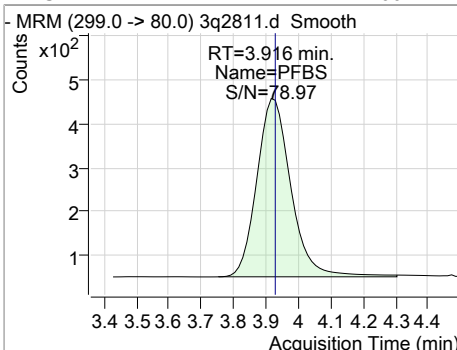
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	0.95	1.73	0.00	2861				



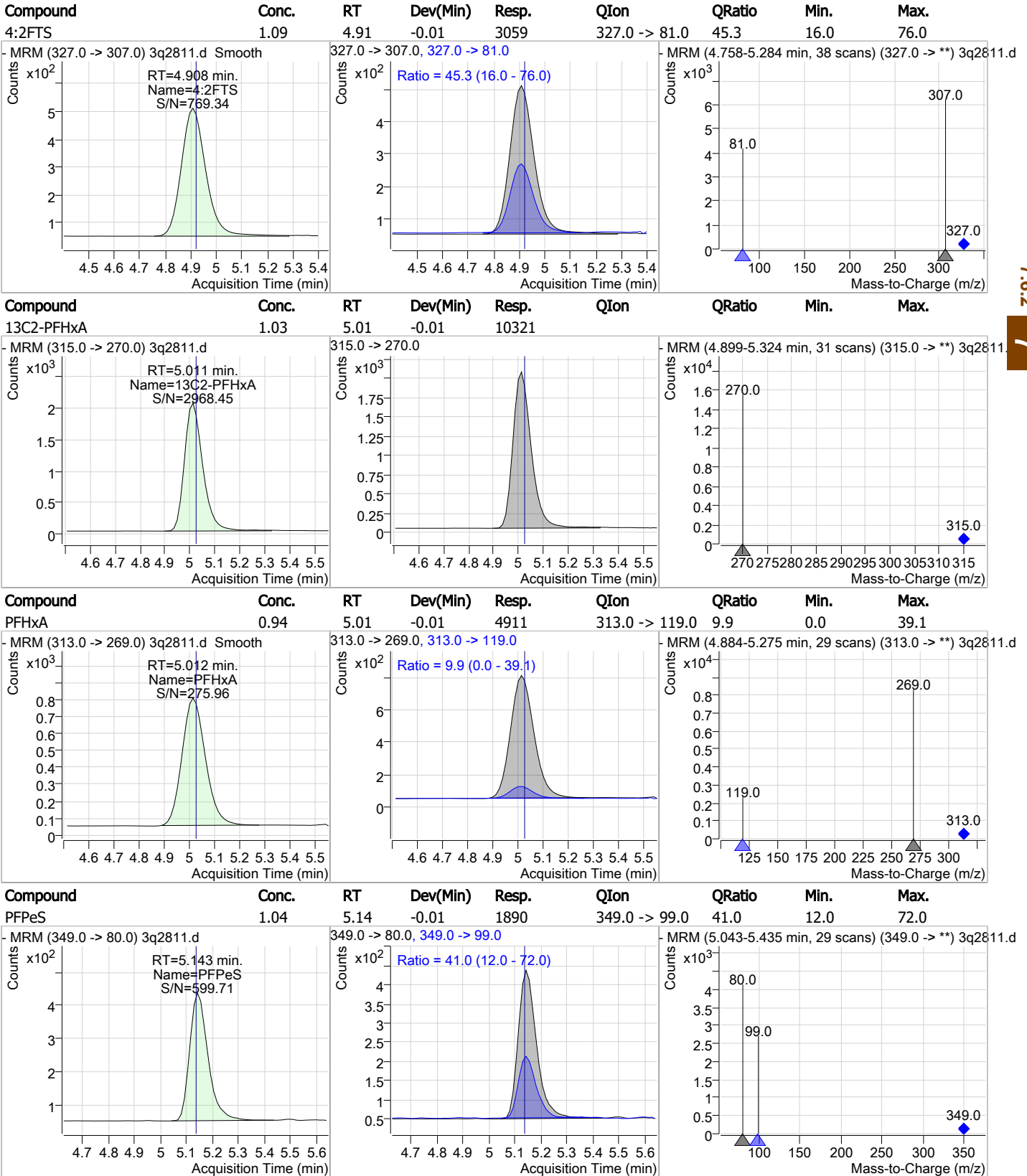
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	1.01	3.61	-0.01	9844				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	1.00	3.92	-0.01	2988	299.0 -> 99.0	38.0	8.8	68.8



Perfluorinated Compounds by LC/MS/MS

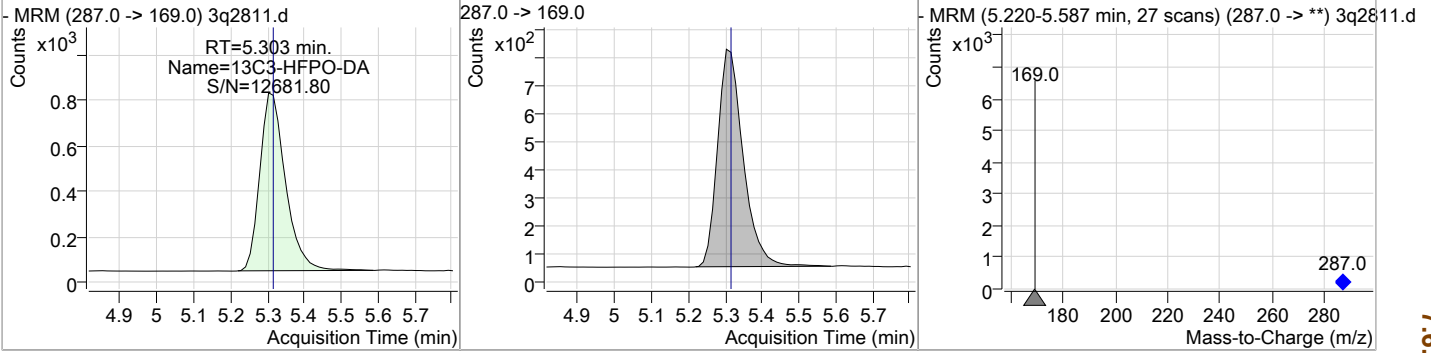


7.6.2
7

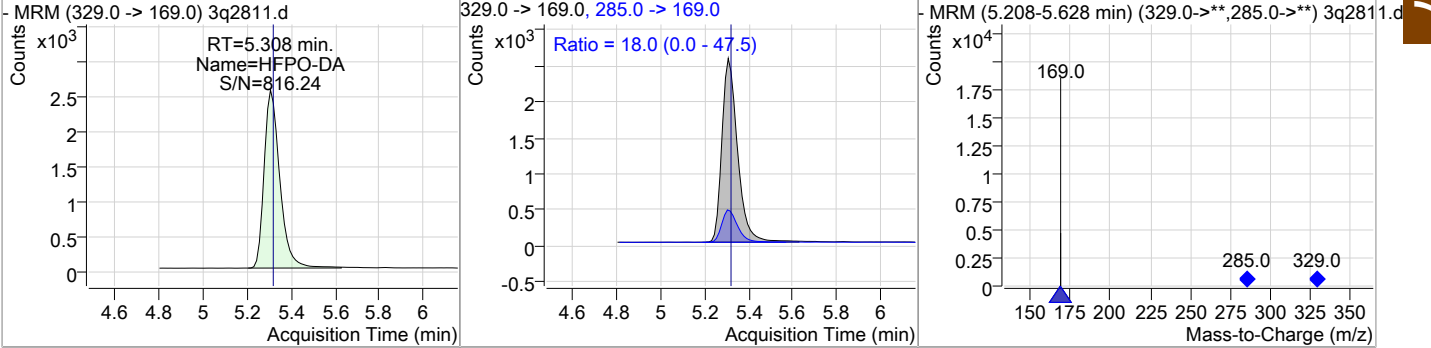


Perfluorinated Compounds by LC/MS/MS

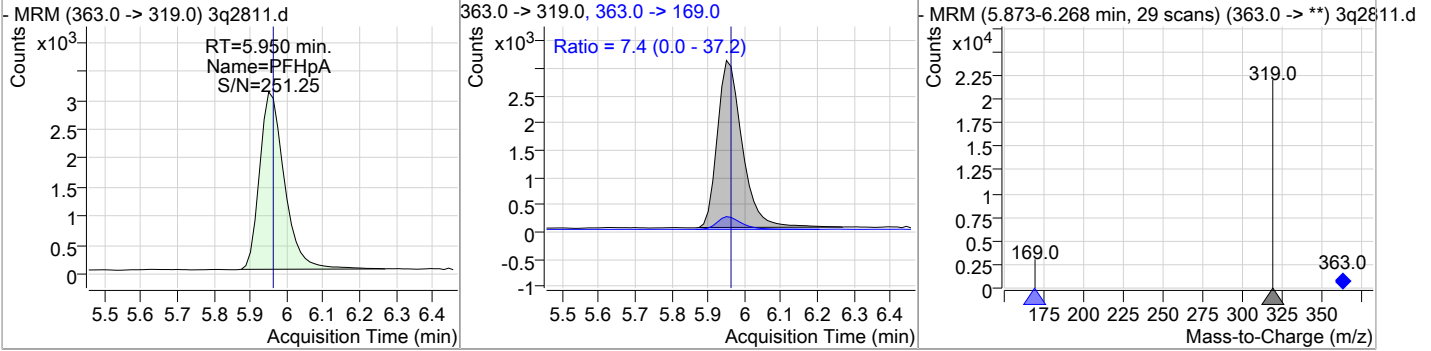
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	5.43	5.30	-0.01	3767				



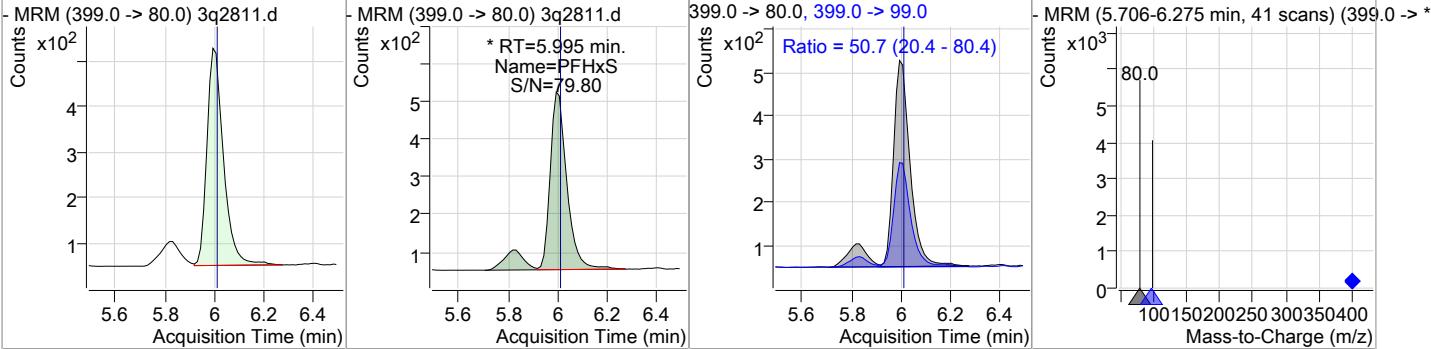
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	5.34	5.31	-0.01	12538	285.0 -> 169.0	18.0	0.0	47.5



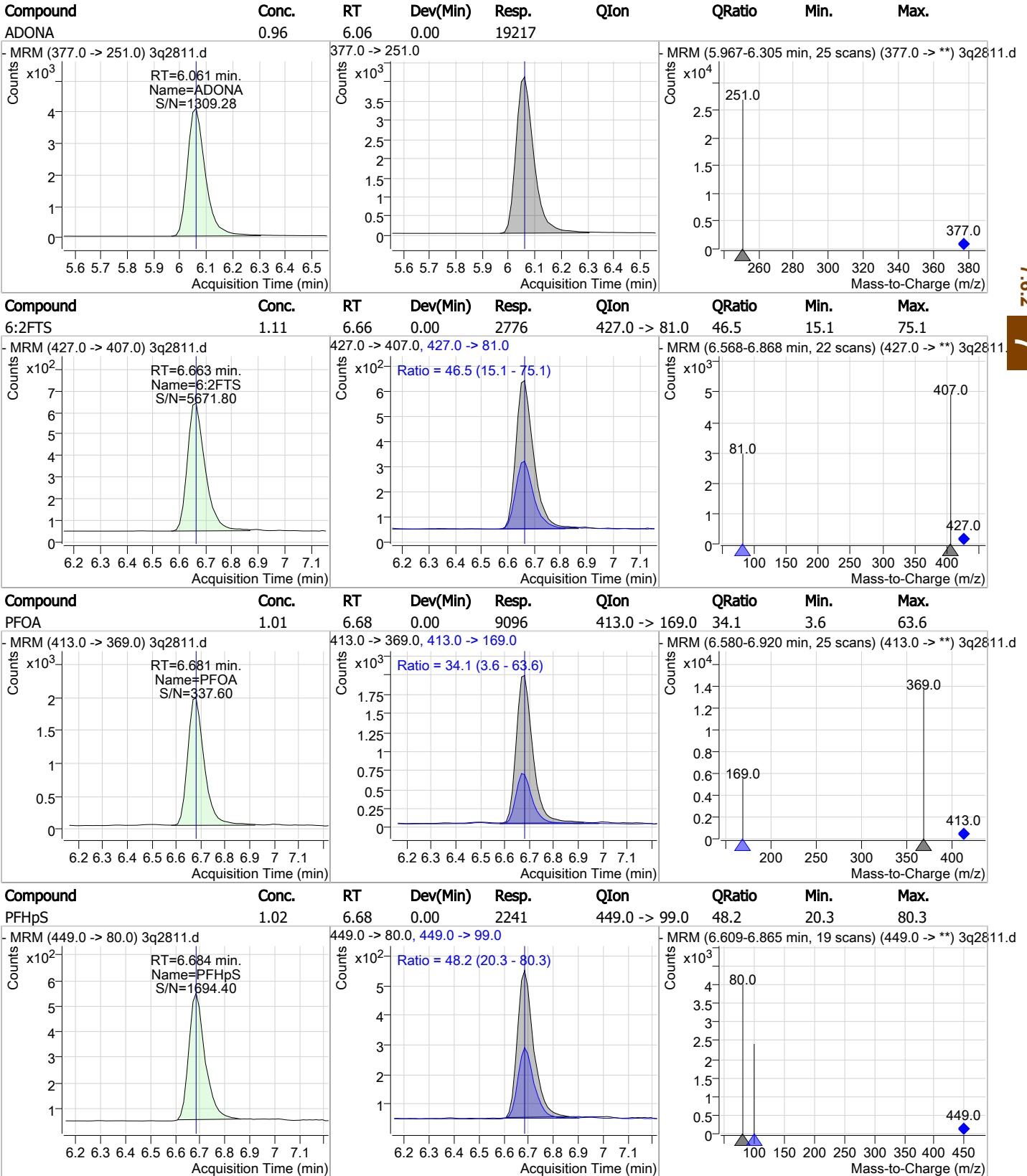
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	0.95	5.95	-0.01	14494	363.0 -> 169.0	7.4	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	1.03	5.99	-0.01	2504 (m)	399.0 -> 99.0	50.7	20.4	80.4



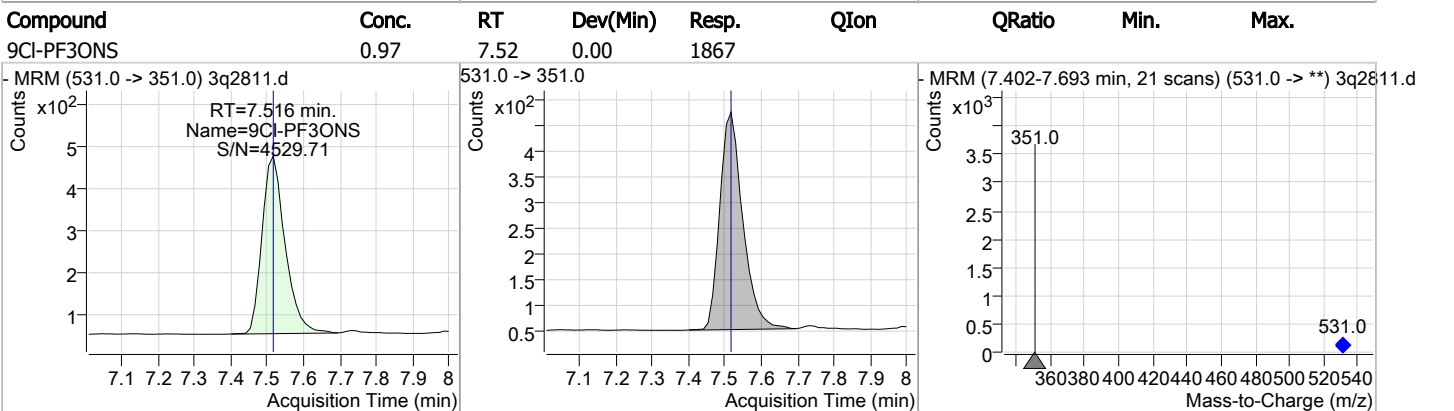
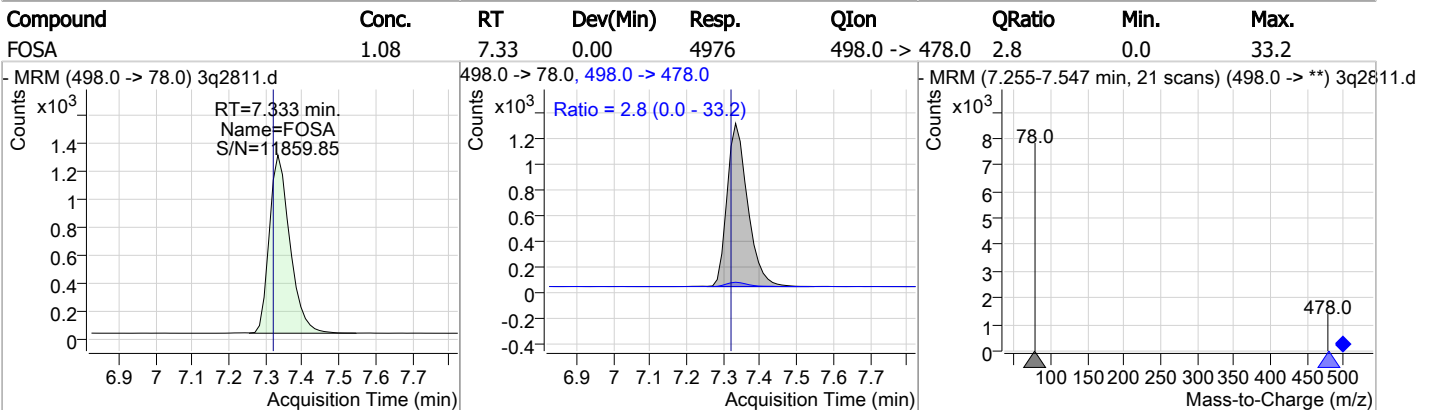
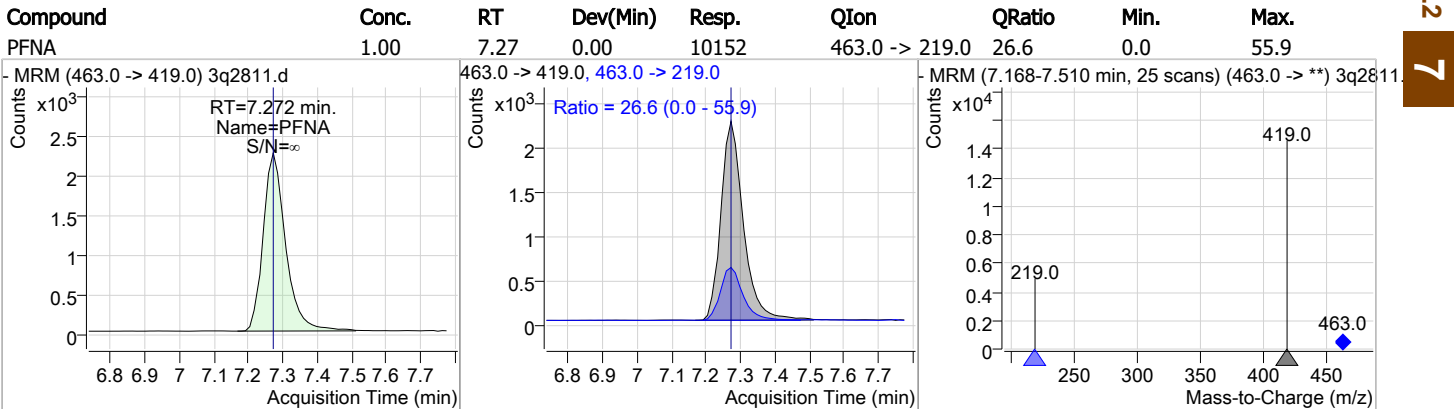
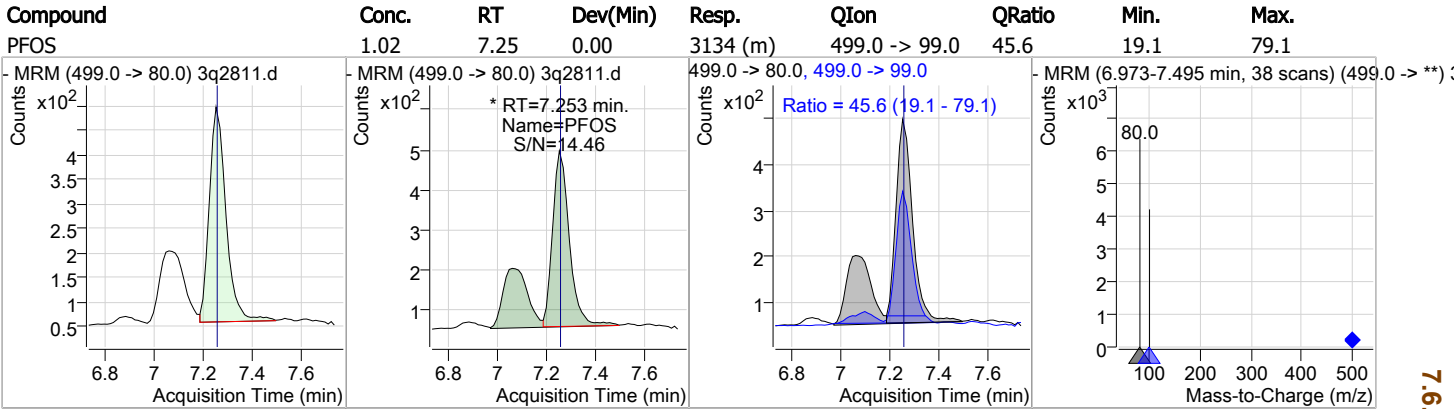
Perfluorinated Compounds by LC/MS/MS



7.6.2

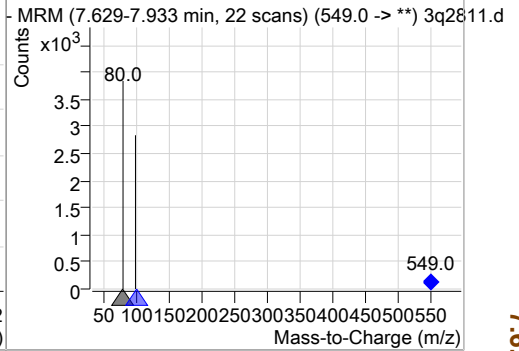
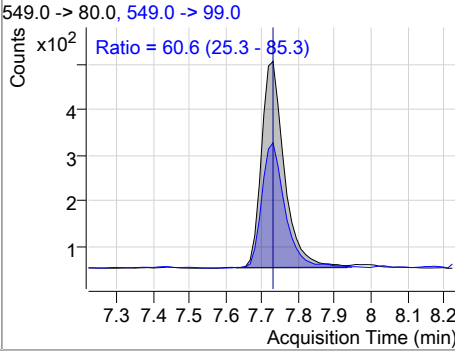
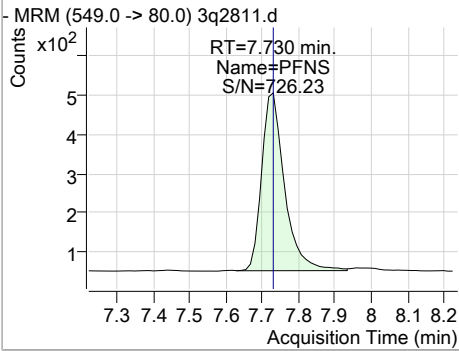
7

Perfluorinated Compounds by LC/MS/MS

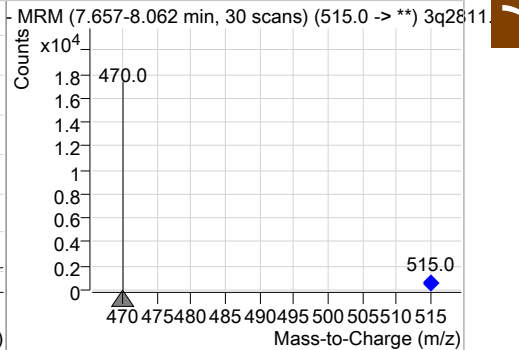
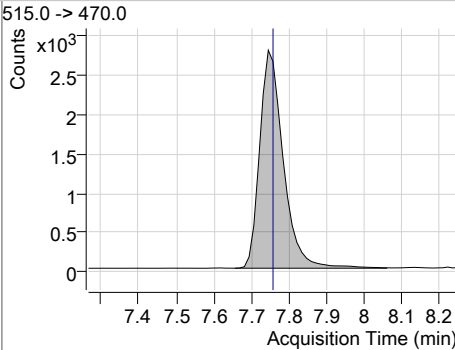
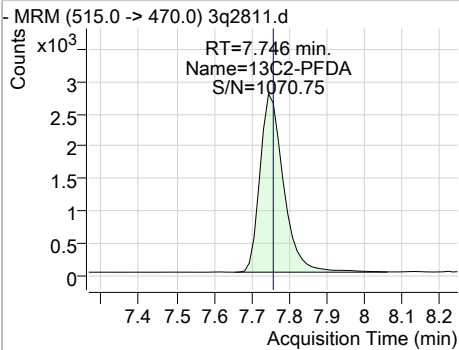


Perfluorinated Compounds by LC/MS/MS

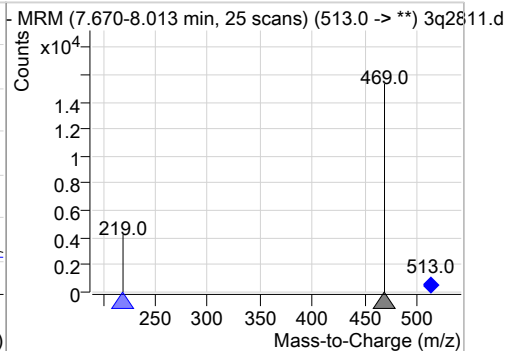
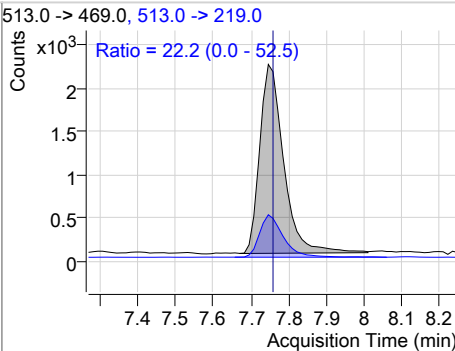
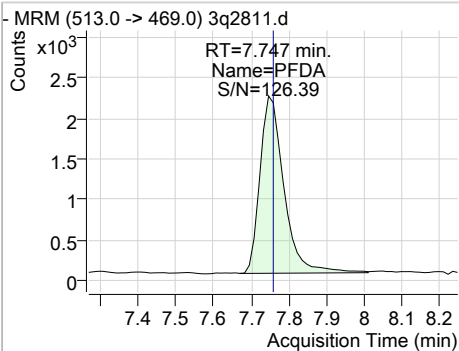
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	1.03	7.73	0.00	1985	549.0 -> 99.0	60.6	25.3	85.3



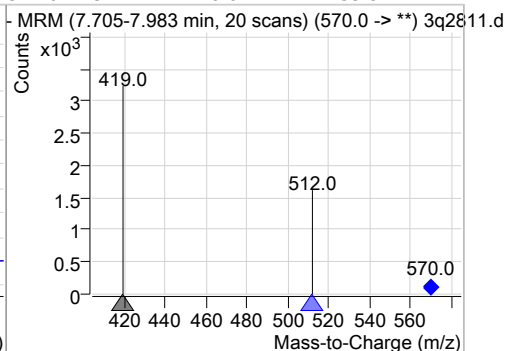
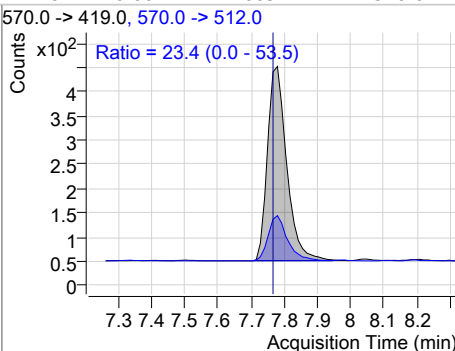
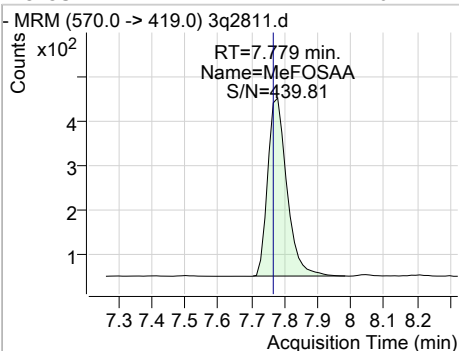
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	1.07	7.75	-0.01	12099				



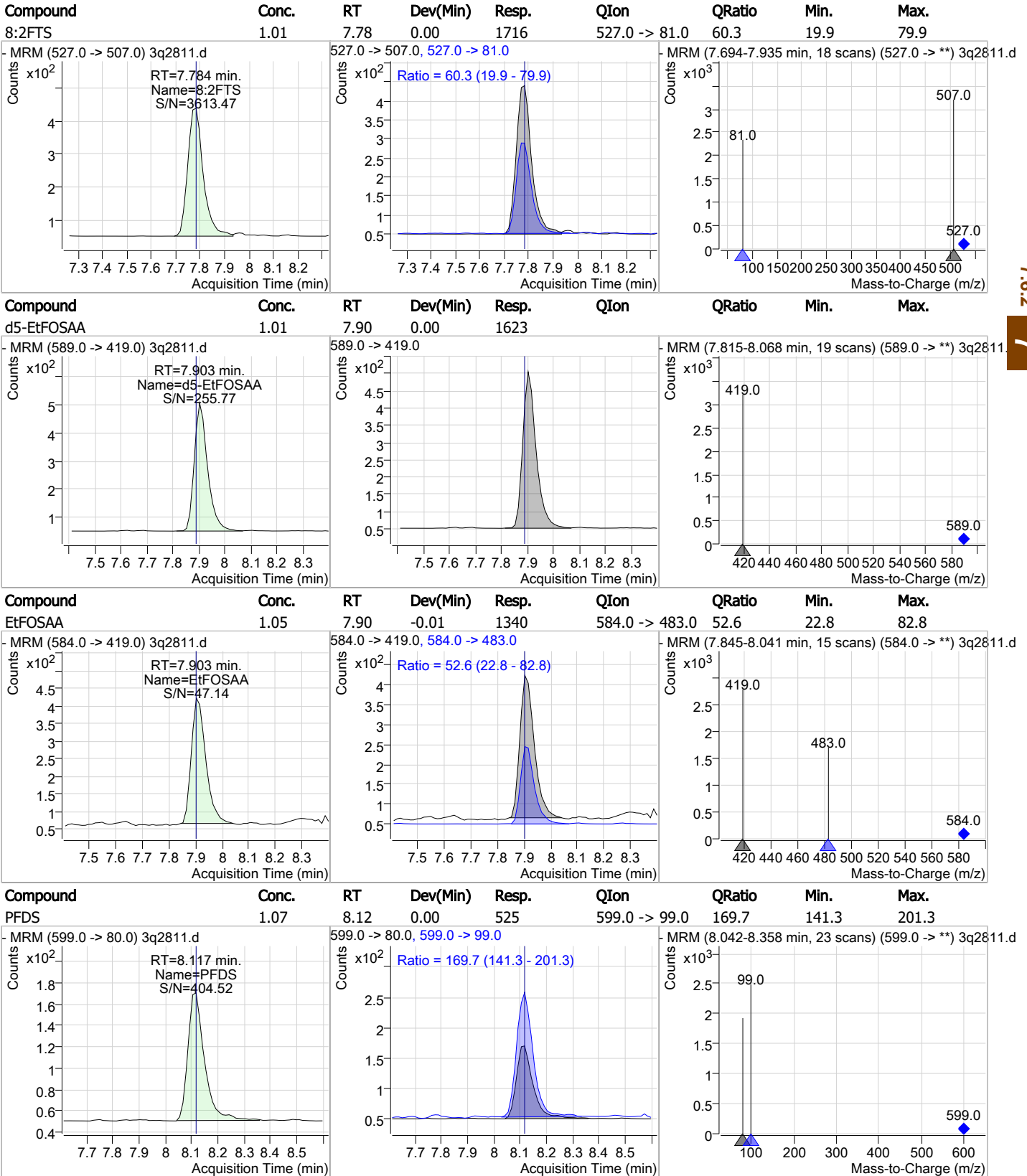
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	1.12	7.75	-0.01	9685	513.0 -> 219.0	22.2	0.0	52.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	1.07	7.78	0.00	1609	570.0 -> 512.0	23.4	0.0	53.5



Perfluorinated Compounds by LC/MS/MS

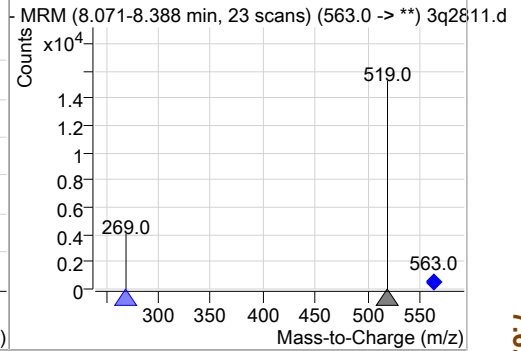
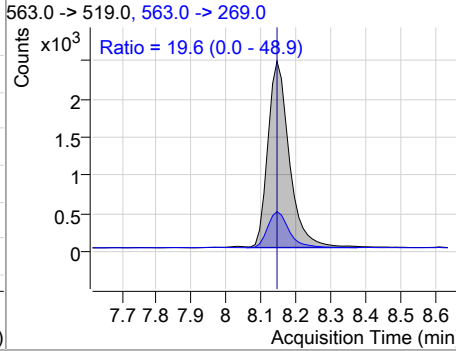
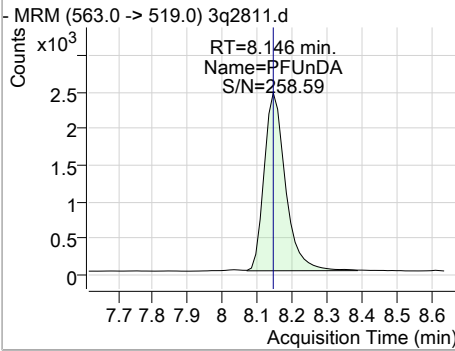


7.6.2

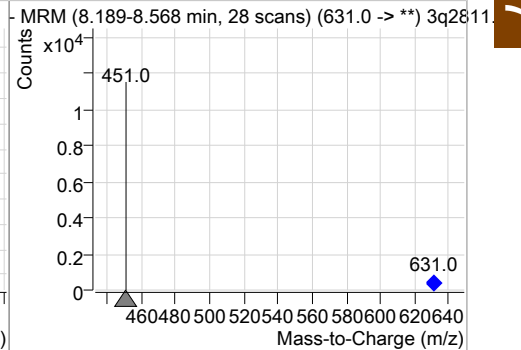
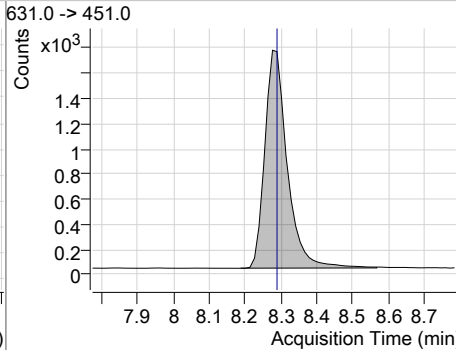
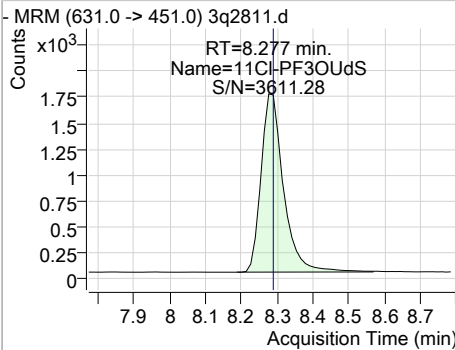
7

Perfluorinated Compounds by LC/MS/MS

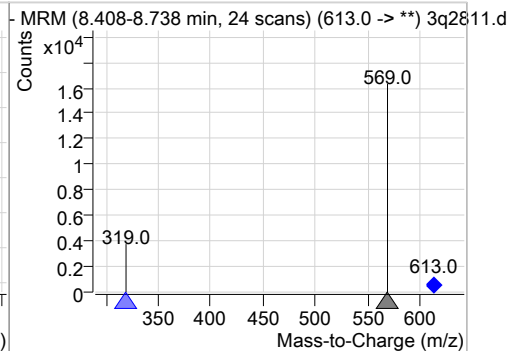
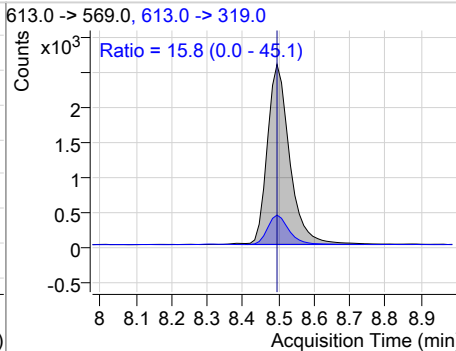
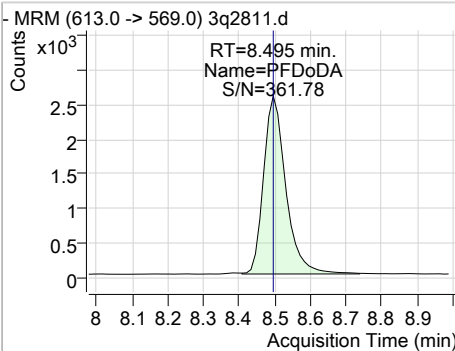
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	1.08	8.15	0.00	10376	563.0 -> 269.0	19.6	0.0	48.9



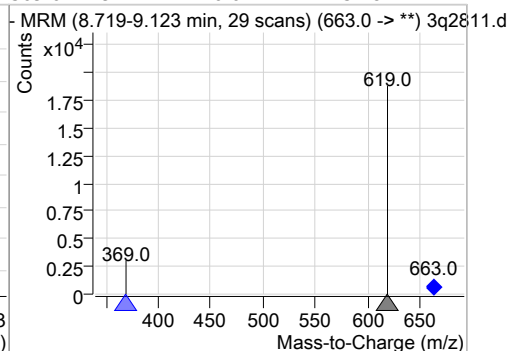
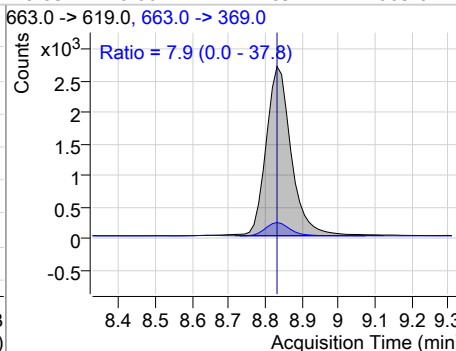
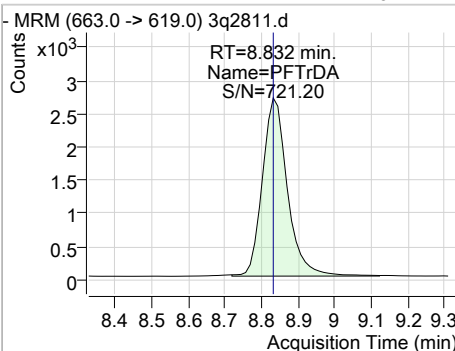
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	0.95	8.28	-0.01	7544	631.0 -> 451.0	15.8	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	1.03	8.50	0.00	11137	613.0 -> 319.0	15.8	0.0	45.1

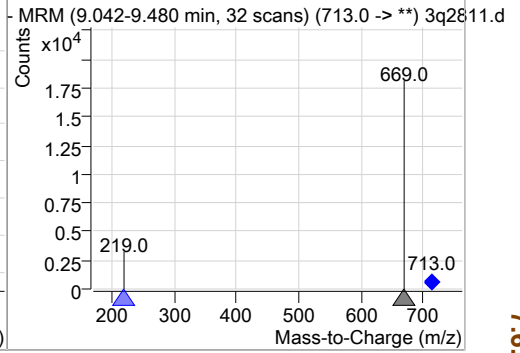
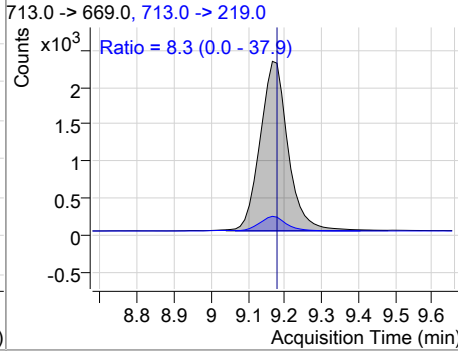
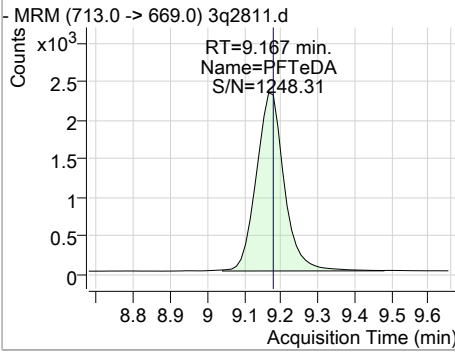


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	1.01	8.83	0.00	12789	663.0 -> 369.0	7.9	0.0	37.8



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	1.01	9.17	-0.01	12121	713.0 -> 219.0	8.3	0.0	37.9



7.6.2

7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2811.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 15:10 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.2.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2812.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 3:32:40 PM
 Sample Name : ic72-2.0
 Vial : P1-A4
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	51531	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	256319	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	221704	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	148093	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	55692	20.00 µg/L	0.000
d3-MeFOSAA	7.765	573.0 -> 419.0	28748	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	23995	2.14 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 10.7%		
13C2-PFHxA	5.011	315.0 -> 270.0	19935	2.00 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 10.0%		
d5-EtFOSAA	7.903	589.0 -> 419.0	3051	1.83 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%		Recovery = 9.1%		
13C3-HFPO-DA	5.316	287.0 -> 169.0	7418	10.77 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%		Recovery = 10.8%		
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	5972	2.14 µg/L	QValue 100
6:2FTS	6.663	427.0 -> 407.0	5341	2.16 µg/L	97
8:2FTS	7.784	527.0 -> 507.0	3819	2.26 µg/L	99
EtFOSAA	7.903	584.0 -> 419.0	2789	2.12 µg/L	99
FOSA	7.333	498.0 -> 78.0	9683	2.03 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	2905	1.87 µg/L	95
PFBA	1.726	213.0 -> 169.0	5422	1.81 µg/L	100
PFBS	3.928	299.0 -> 80.0	5862	1.98 µg/L	99
PFDA	7.747	513.0 -> 469.0	19952	2.32 µg/L	97
PFDoDA	8.495	613.0 -> 569.0	22306	1.99 µg/L	99
PFDS	8.117	599.0 -> 80.0	1017	2.10 µg/L	98
PFHpA	5.950	363.0 -> 319.0	28803	1.91 µg/L	99
PFHpS	6.684	449.0 -> 80.0	4433	2.04 µg/L	99
PFHxA	5.012	313.0 -> 269.0	9931	1.91 µg/L	99
PFHxS	5.995	399.0 -> 80.0	4646	1.93 µg/L	m 99
PFNA	7.272	463.0 -> 419.0	20816	2.06 µg/L	99
PFNS	7.730	549.0 -> 80.0	4026	2.10 µg/L	99
PFOA	6.681	413.0 -> 369.0	17985	2.01 µg/L	100
PFOS	7.253	499.0 -> 80.0	6157	2.02 µg/L	m 98
PFPeA	3.612	263.0 -> 219.0	18925	1.98 µg/L	100
PFPeS	5.143	349.0 -> 80.0	3745	2.12 µg/L	98
PFTeDA	9.167	713.0 -> 669.0	23812	1.92 µg/L	99
PFTrDA	8.832	663.0 -> 619.0	25436	1.95 µg/L	99
PFUnDA	8.146	563.0 -> 519.0	20430	2.06 µg/L	100
ADONA	6.061	377.0 -> 251.0	37845	1.90 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	3669	1.92 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	15249	1.93 µg/L	100
HFPO-DA	5.308	329.0 -> 169.0	24810	10.64 µg/L	99

7.6.3
7

Perfluorinated Compounds by LC/MS/MS

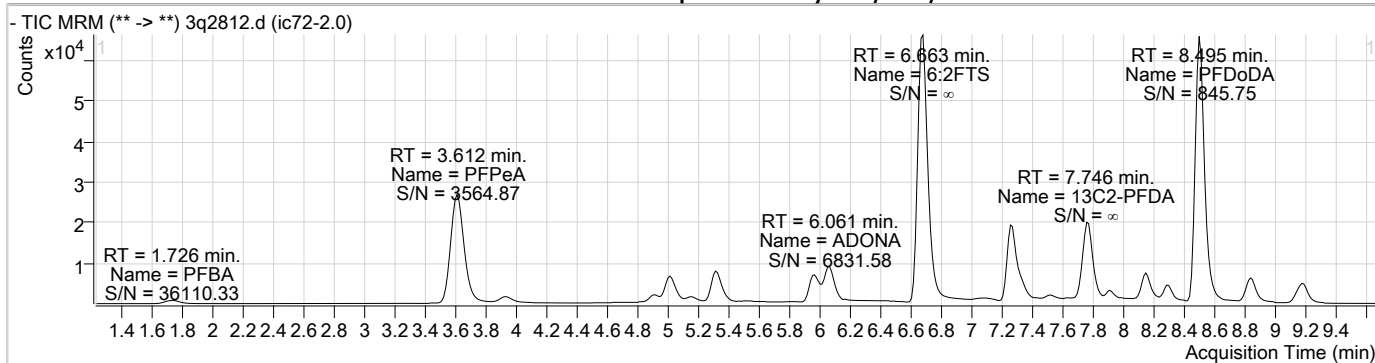
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

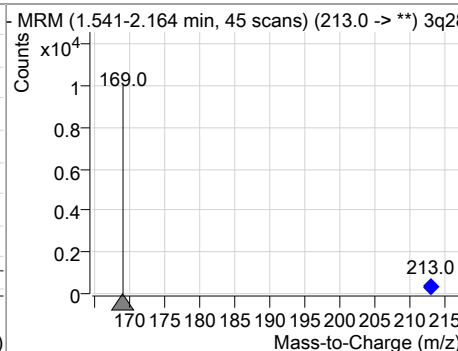
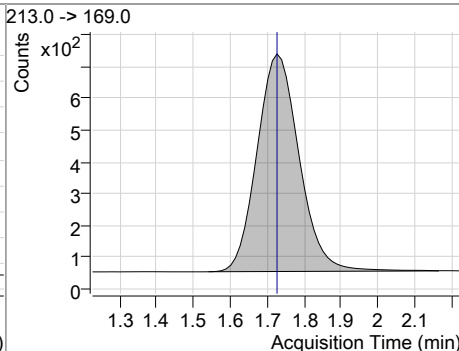
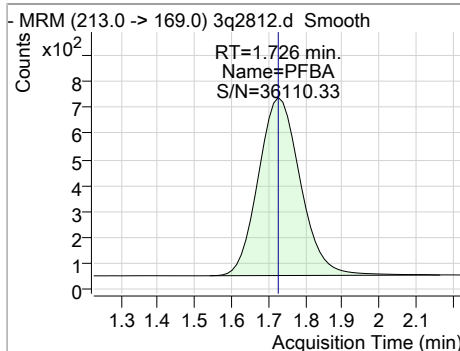
7.6.3

7

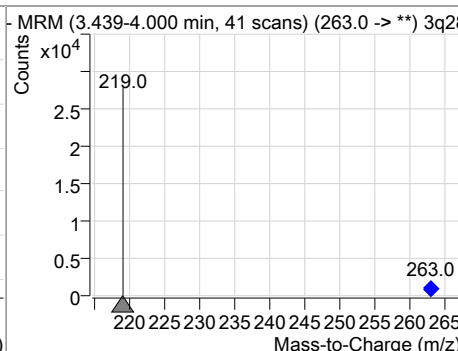
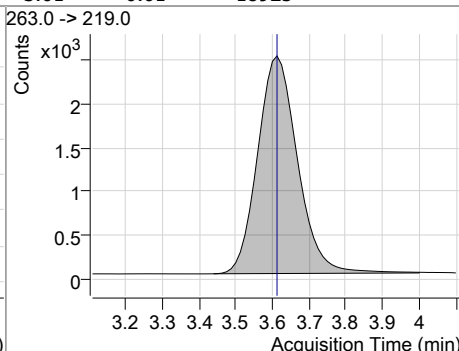
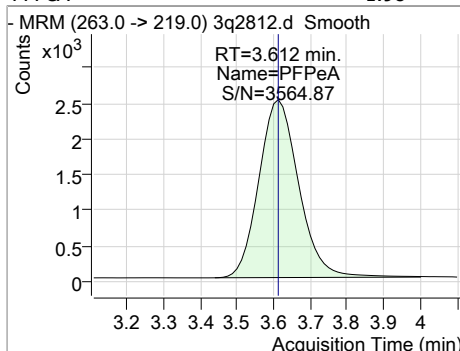
Perfluorinated Compounds by LC/MS/MS



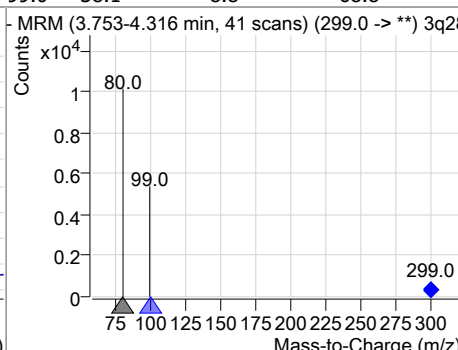
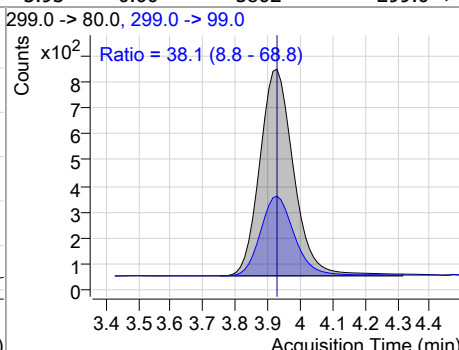
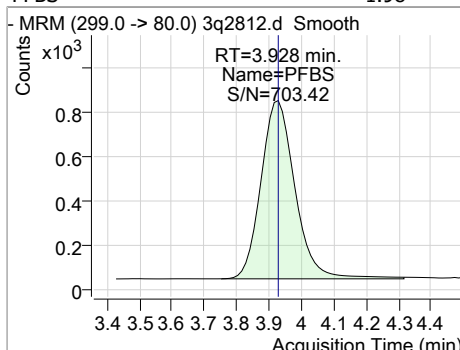
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	1.81	1.73	0.00	5422				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	1.98	3.61	-0.01	18925				

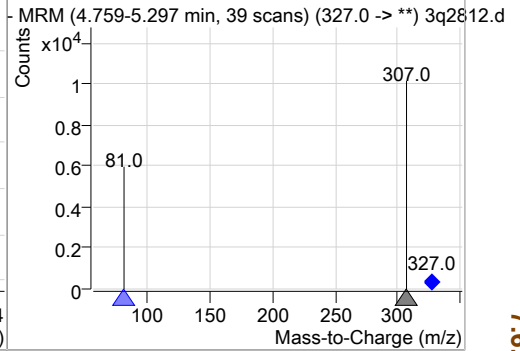
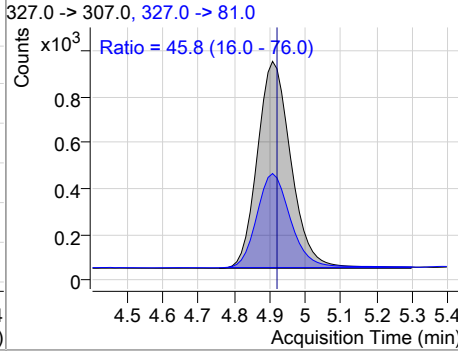
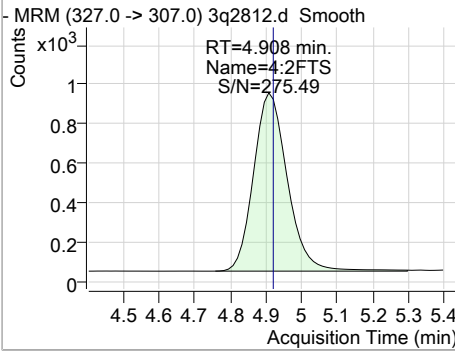


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	1.98	3.93	0.00	5862	299.0 -> 99.0	38.1	8.8	68.8

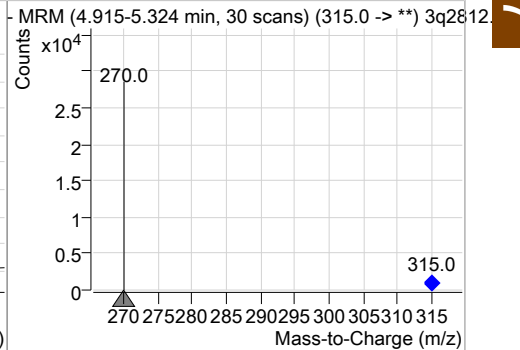
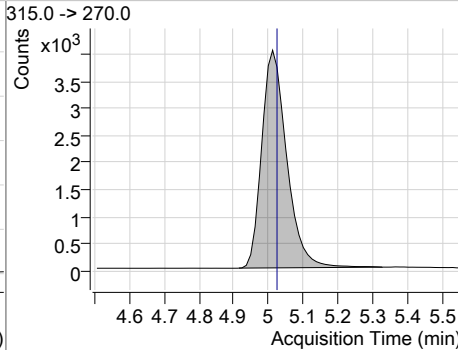
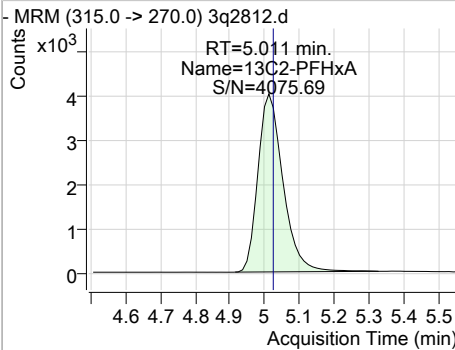


Perfluorinated Compounds by LC/MS/MS

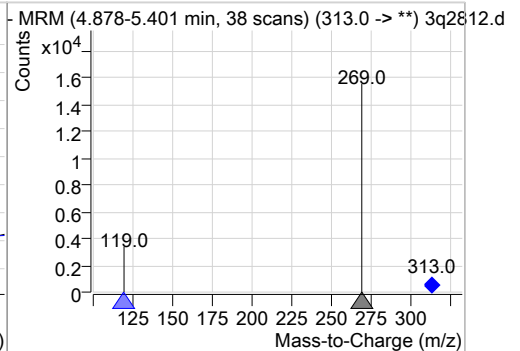
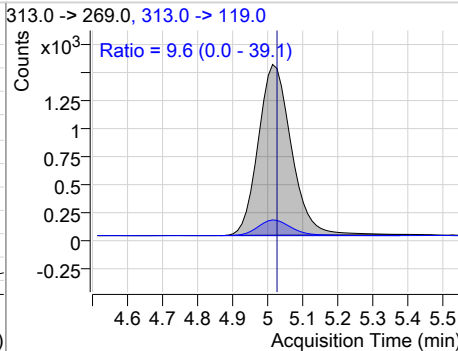
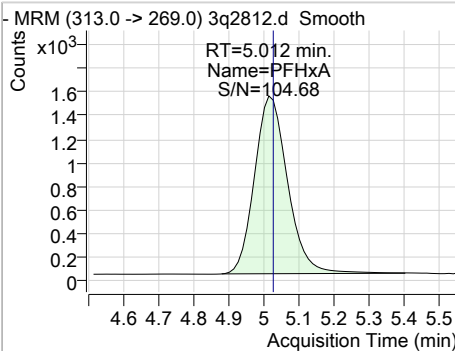
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	2.14	4.91	-0.01	5972	327.0 -> 81.0	45.8	16.0	76.0



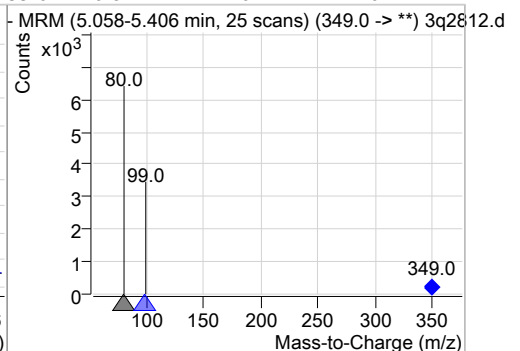
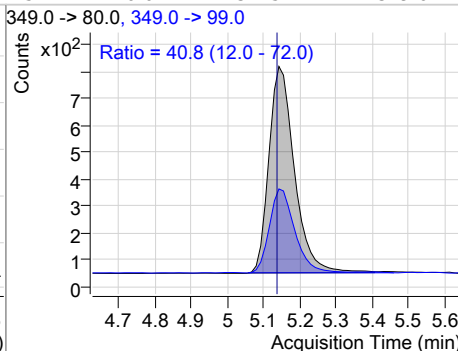
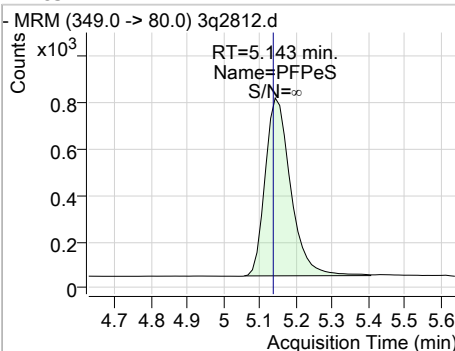
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	2.00	5.01	-0.01	19935				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	1.91	5.01	-0.01	9931	313.0 -> 119.0	9.6	0.0	39.1

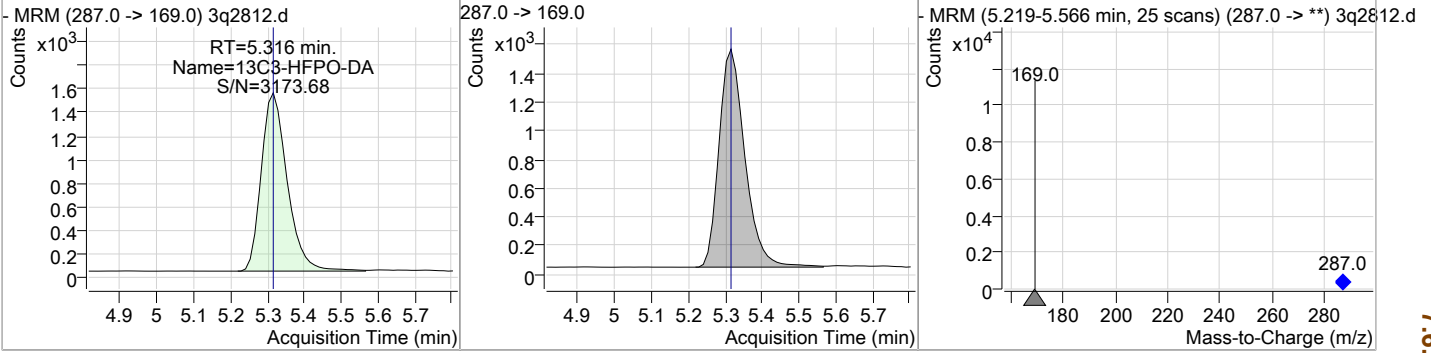


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	2.12	5.14	-0.01	3745	349.0 -> 99.0	40.8	12.0	72.0

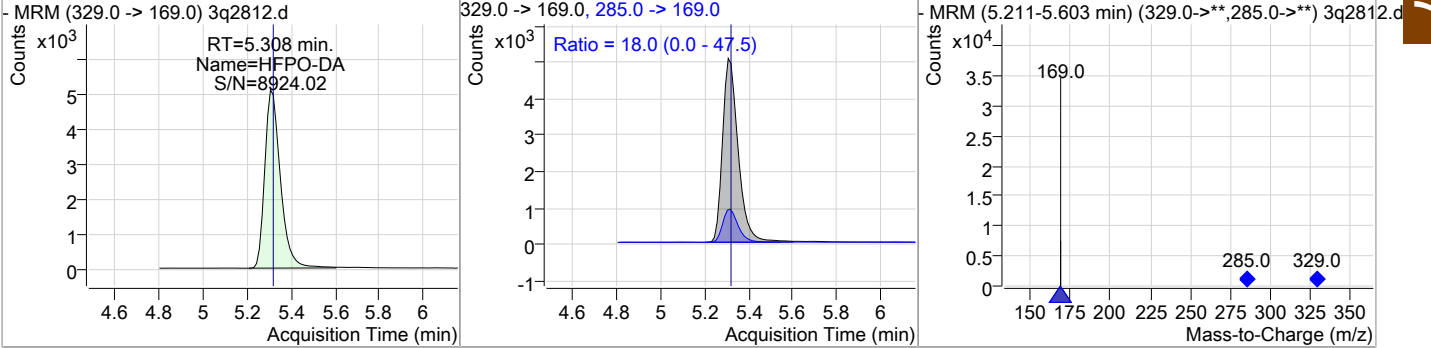


Perfluorinated Compounds by LC/MS/MS

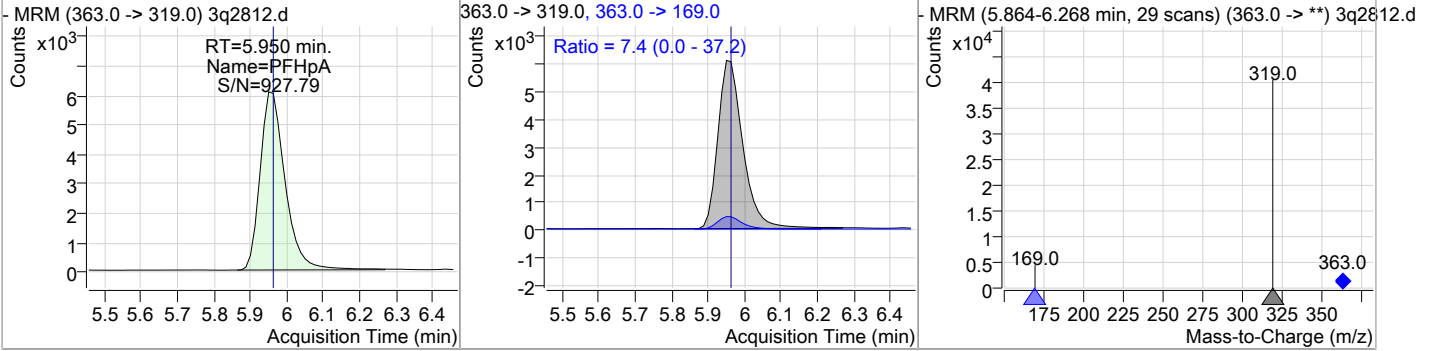
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	10.77	5.32	0.00	7418				



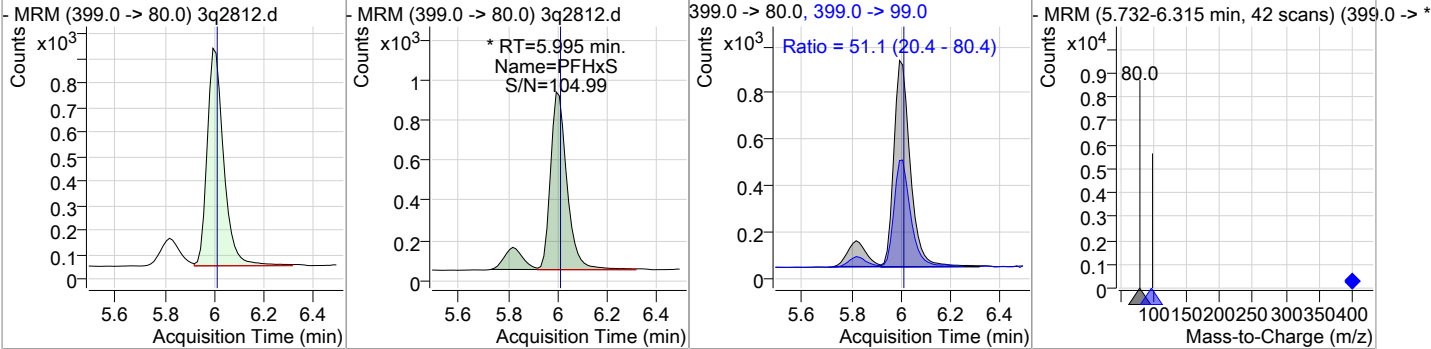
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	10.64	5.31	-0.01	24810	285.0 -> 169.0	18.0	0.0	47.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	1.91	5.95	-0.01	28803	363.0 -> 169.0	7.4	0.0	37.2

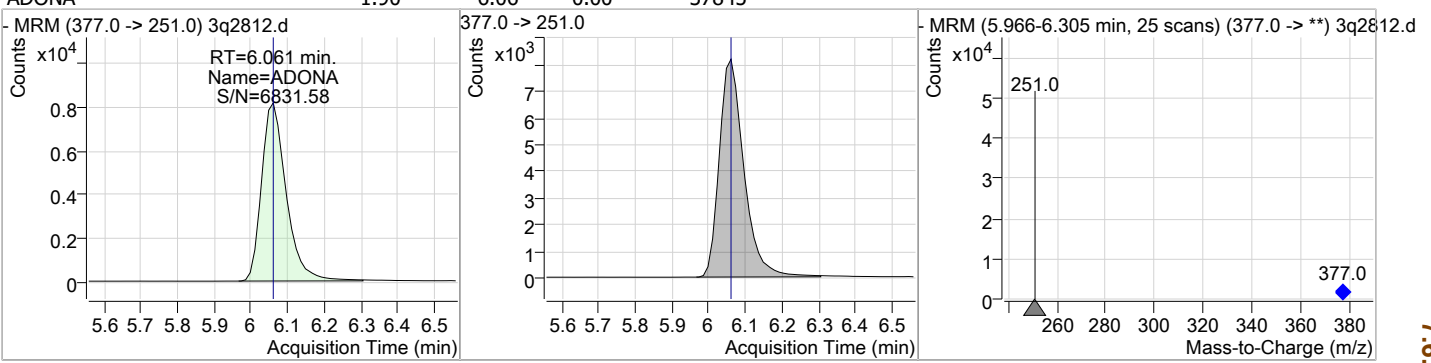


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	1.93	5.99	-0.01	4646 (m)	399.0 -> 99.0	51.1	20.4	80.4

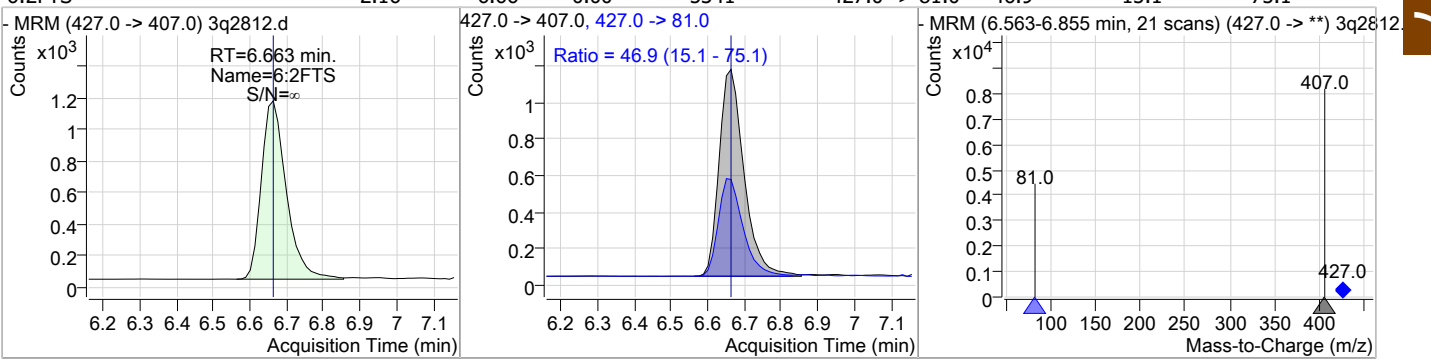


Perfluorinated Compounds by LC/MS/MS

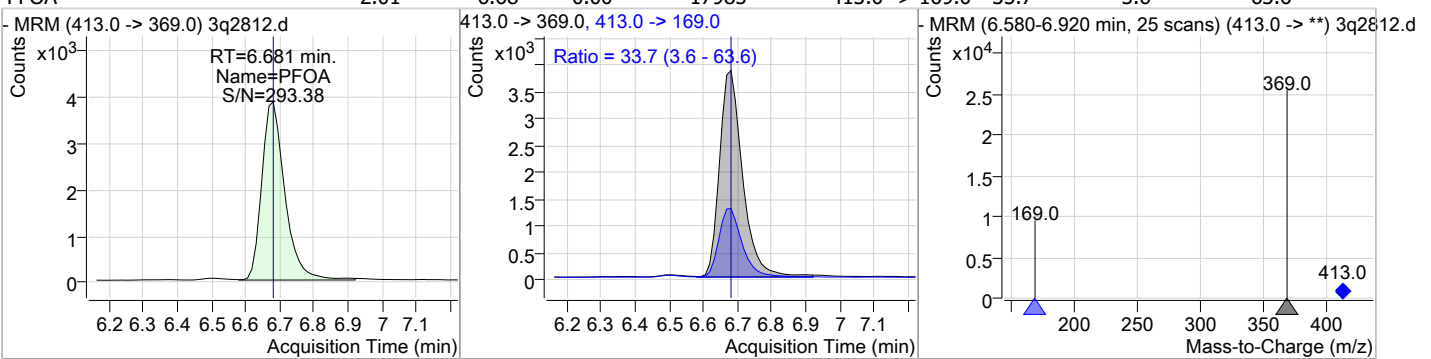
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



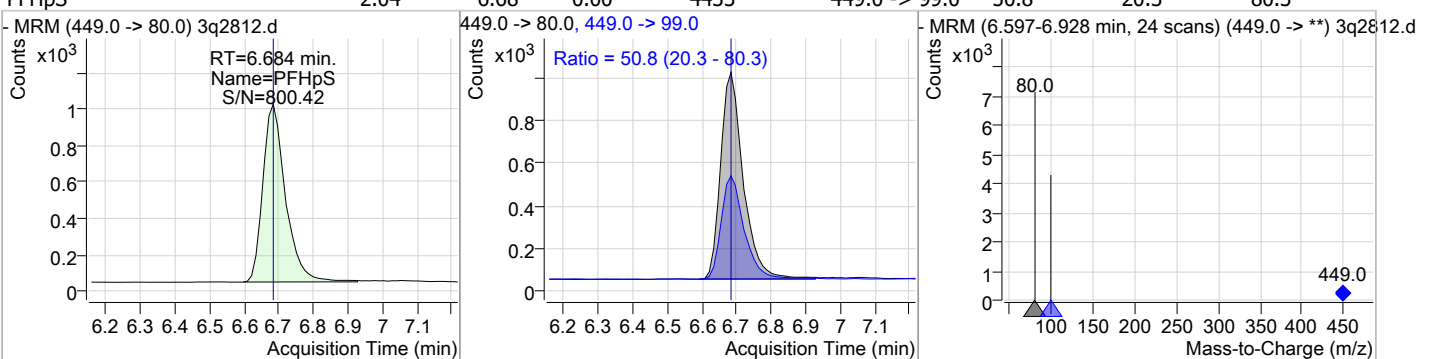
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



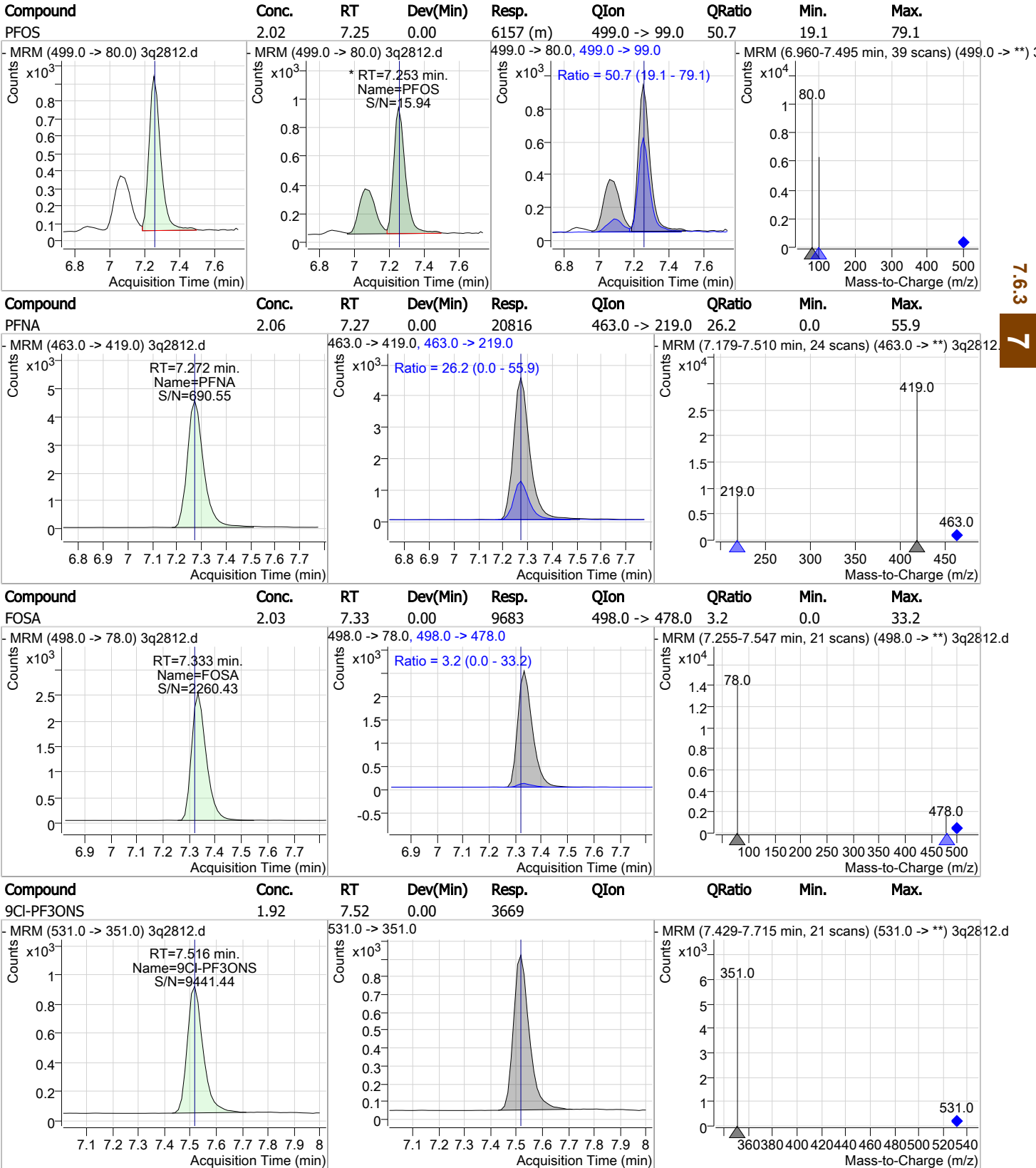
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Perfluorinated Compounds by LC/MS/MS



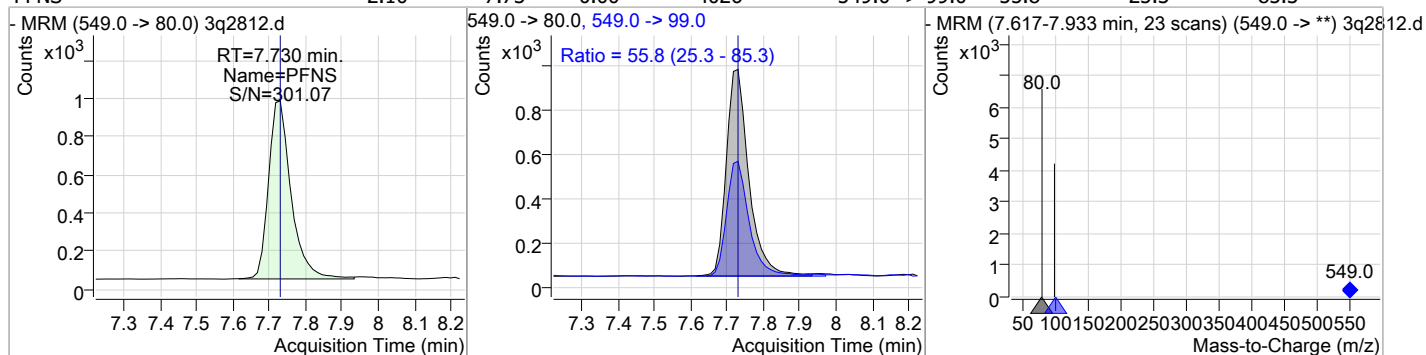
7.6.3

7

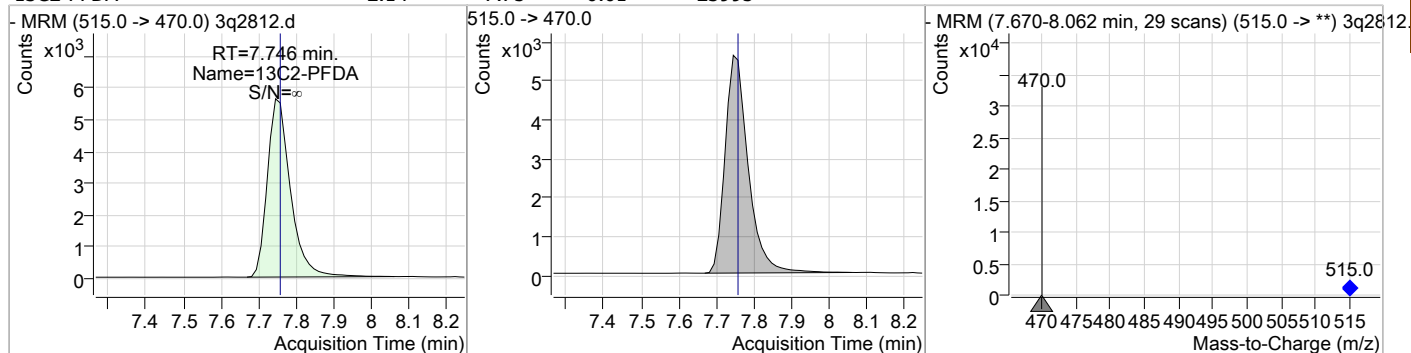


Perfluorinated Compounds by LC/MS/MS

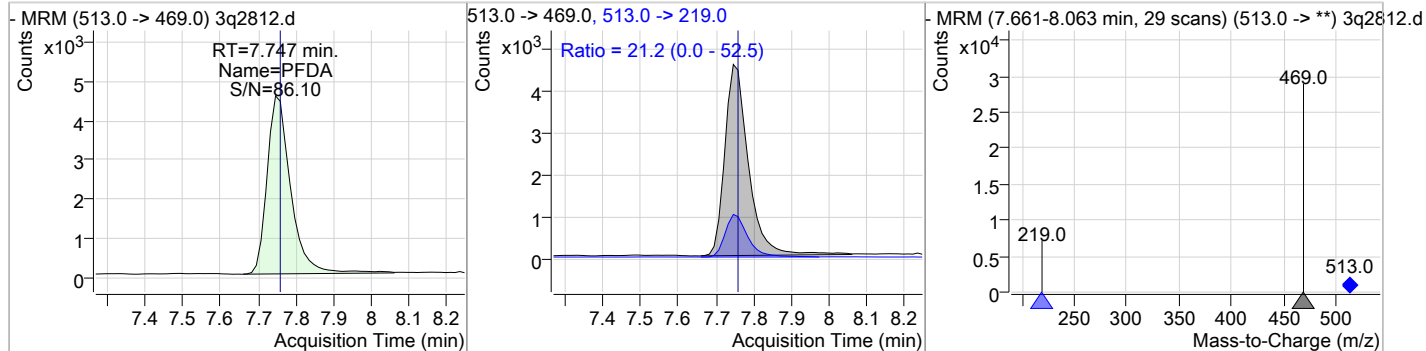
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	2.10	7.73	0.00	4026	549.0 -> 99.0	55.8	25.3	85.3



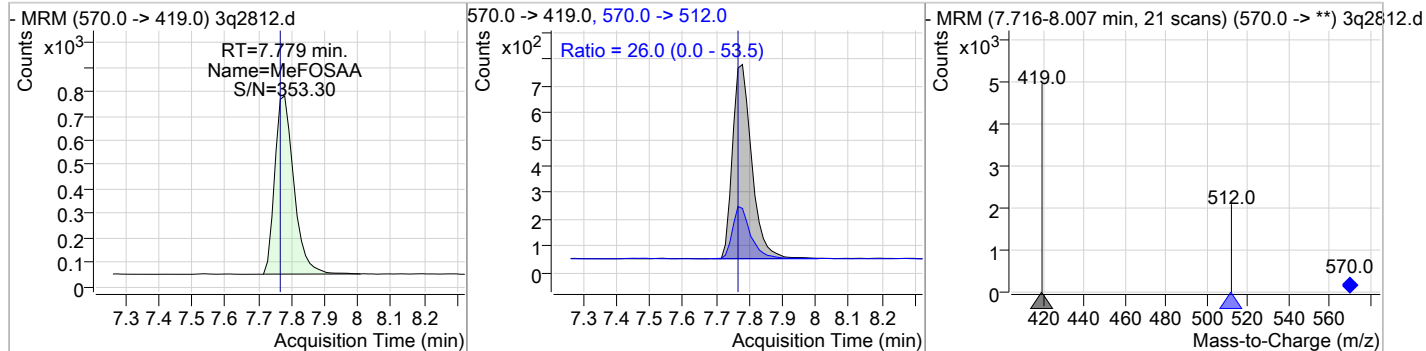
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	2.14	7.75	-0.01	23995				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	2.32	7.75	-0.01	19952	513.0 -> 219.0	21.2	0.0	52.5

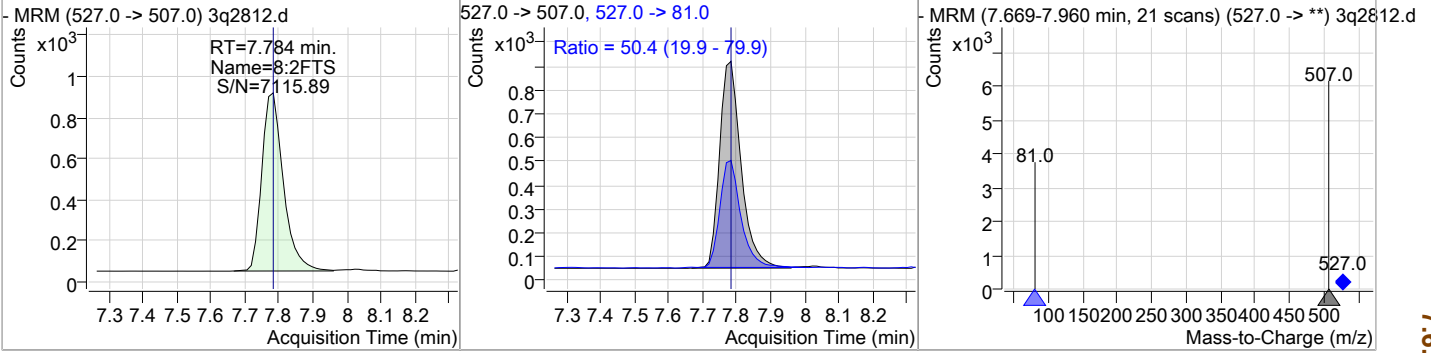


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	1.87	7.78	0.00	2905	570.0 -> 512.0	26.0	0.0	53.5

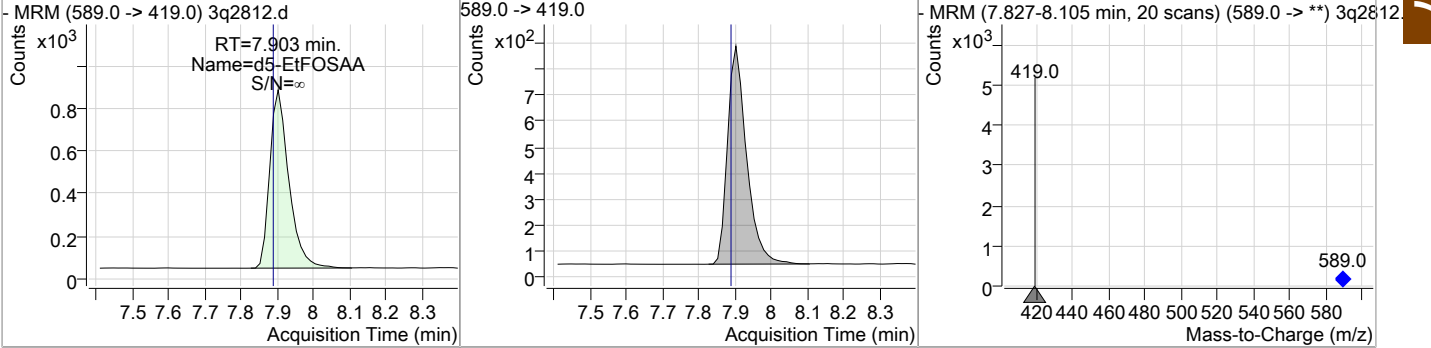


Perfluorinated Compounds by LC/MS/MS

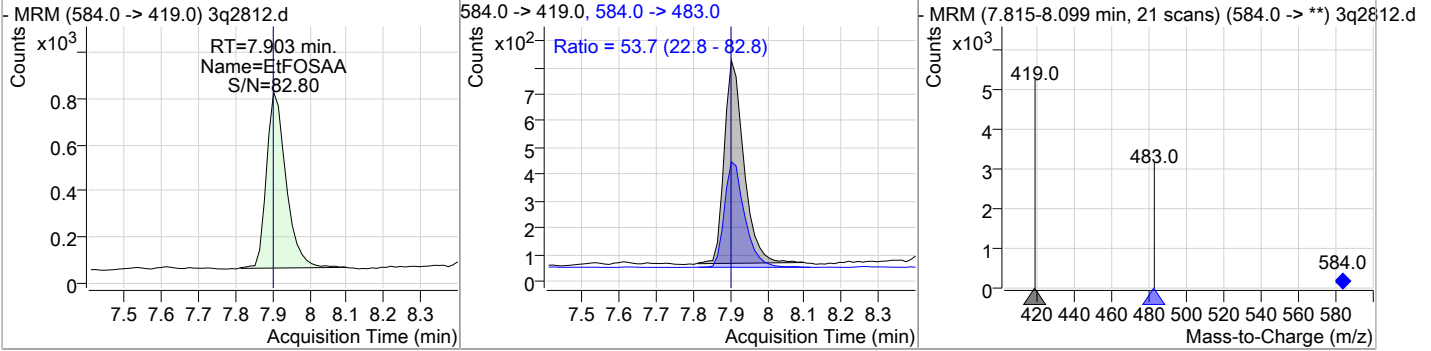
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	2.26	7.78	0.00	3819	527.0 -> 81.0	50.4	19.9	79.9



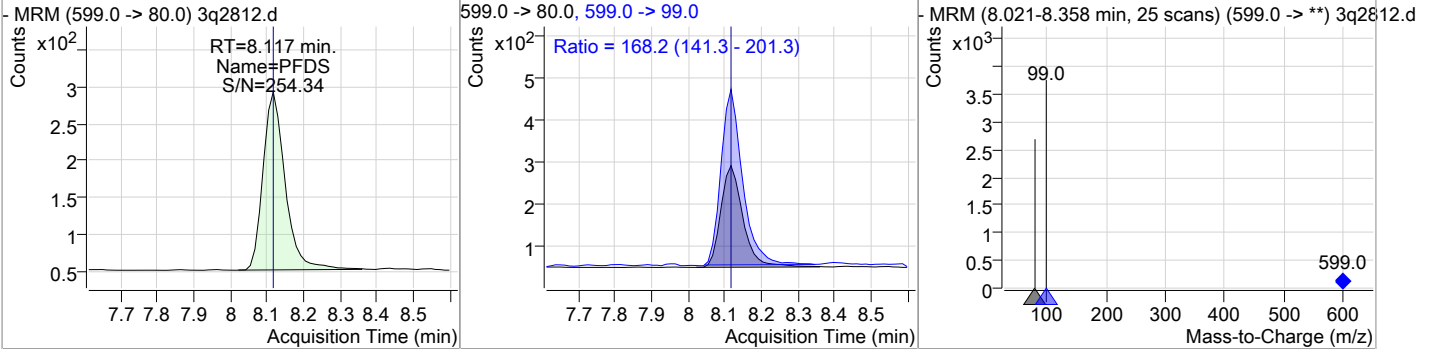
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	1.83	7.90	0.00	3051				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	2.12	7.90	-0.01	2789	584.0 -> 483.0	53.7	22.8	82.8

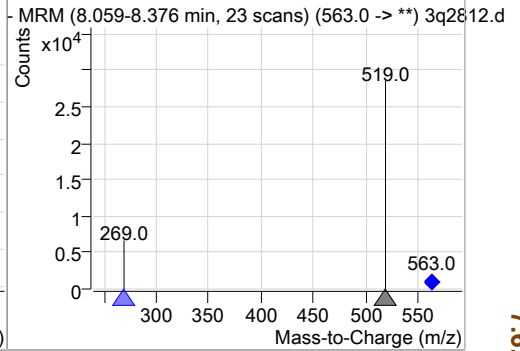
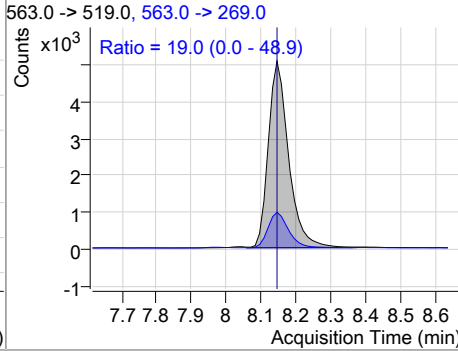
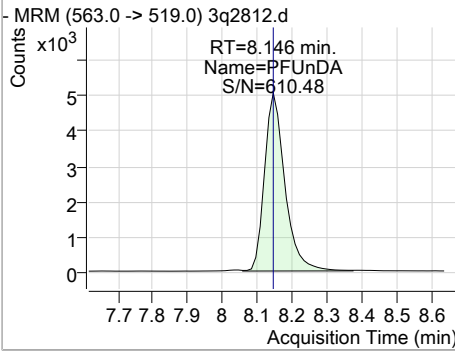


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	2.10	8.12	0.00	1017	599.0 -> 99.0	168.2	141.3	201.3

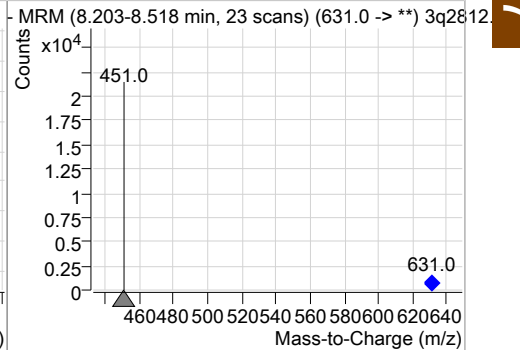
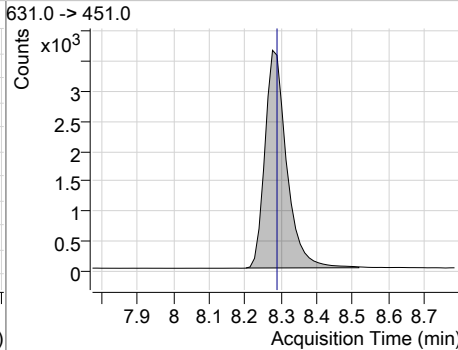
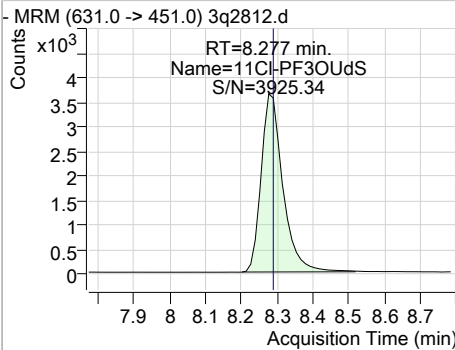


Perfluorinated Compounds by LC/MS/MS

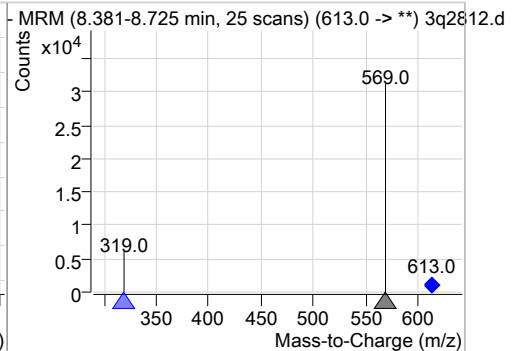
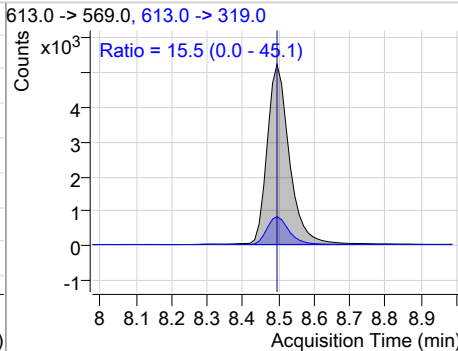
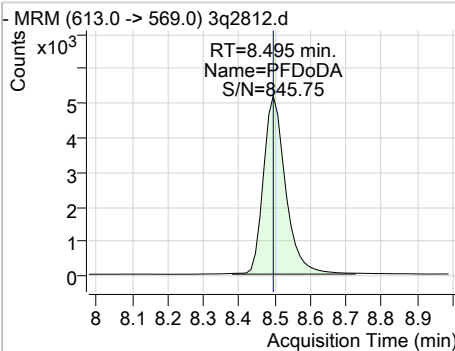
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	2.06	8.15	0.00	20430	563.0 -> 269.0	19.0	0.0	48.9



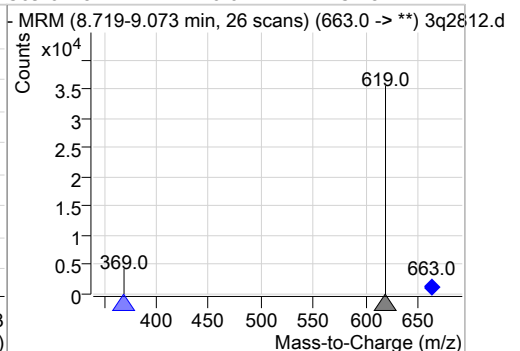
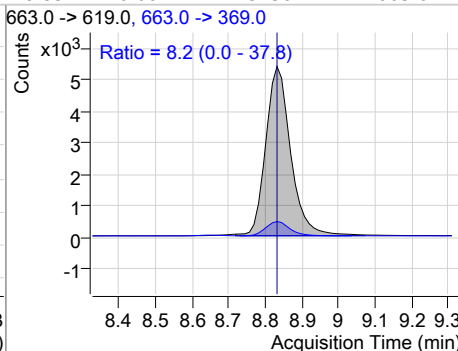
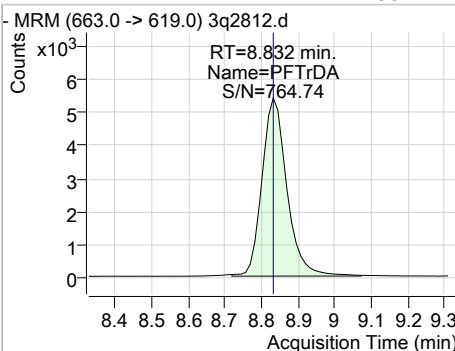
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	1.93	8.28	-0.01	15249	631.0 -> 451.0	15.5	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	1.99	8.50	0.00	22306	613.0 -> 319.0	15.5	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	1.95	8.83	0.00	25436	663.0 -> 369.0	8.2	0.0	37.8

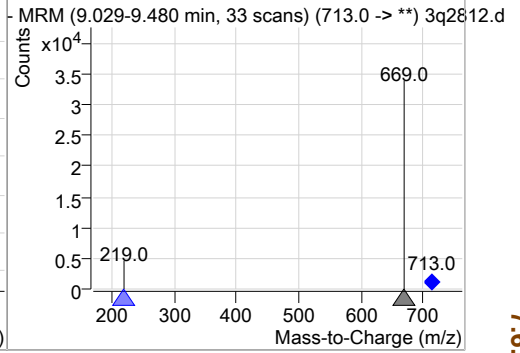
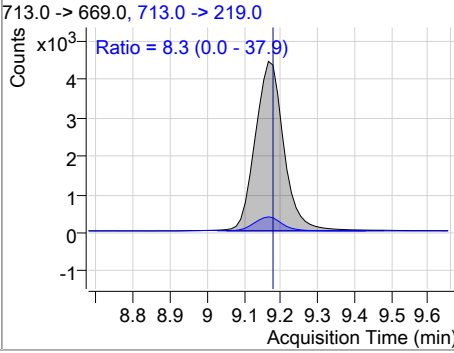
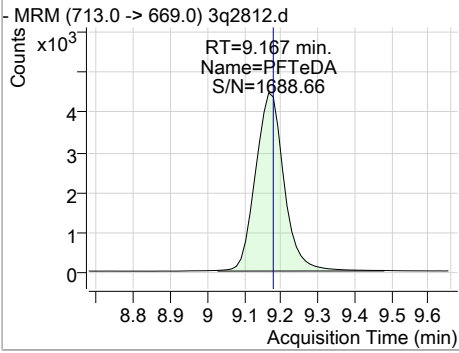


7.6.3
7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	1.92	9.17	-0.01	23812	713.0 -> 219.0	8.3	0.0	37.9



7.6.3
7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2812.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 15:32 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.3.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2813.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 3:48:00 PM
 Sample Name : ic72-5.0
 Vial : P1-A5
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	53804	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	256044	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	229685	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	156461	20.00 µg/L	0.000
13C4-PFOS	7.252	503.0 -> 80.0	58174	20.00 µg/L	0.000
d3-MeFOSAA	7.765	573.0 -> 419.0	29060	20.00 µg/L	-0.013
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	59880	5.16 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 25.8%	
13C2-PFHxA	5.024	315.0 -> 270.0	52058	5.03 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 25.1%	
d5-EtFOSAA	7.903	589.0 -> 419.0	7586	4.50 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 22.5%	
13C3-HFPO-DA	5.316	287.0 -> 169.0	18662	26.21 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 26.2%	
Target Compounds					
4:2FTS	4.921	327.0 -> 307.0	14929	5.12 µg/L	QValue 100
6:2FTS	6.663	427.0 -> 407.0	13189	5.11 µg/L	96
8:2FTS	7.784	527.0 -> 507.0	9503	5.38 µg/L	100
EtFOSAA	7.903	584.0 -> 419.0	6450	4.83 µg/L	99
FOSA	7.333	498.0 -> 78.0	24013	4.98 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	7441	4.73 µg/L	97
PFBA	1.739	213.0 -> 169.0	14084	4.54 µg/L	100
PFBS	3.928	299.0 -> 80.0	14853	4.81 µg/L	100
PFDA	7.747	513.0 -> 469.0	47568	5.35 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	54775	4.88 µg/L	100
PFDS	8.117	599.0 -> 80.0	2481	4.91 µg/L	98
PFHpA	5.962	363.0 -> 319.0	73617	4.71 µg/L	99
PFHpS	6.684	449.0 -> 80.0	10940	4.81 µg/L	97
PFHxA	5.025	313.0 -> 269.0	25771	4.79 µg/L	99
PFHxS	6.007	399.0 -> 80.0	12405	4.94 µg/L	m 98
PFNA	7.272	463.0 -> 419.0	52092	4.98 µg/L	100
PFNS	7.730	549.0 -> 80.0	10103	5.05 µg/L	99
PFOA	6.681	413.0 -> 369.0	45523	4.91 µg/L	99
PFOS	7.253	499.0 -> 80.0	15386	4.82 µg/L	m 99
PFPeA	3.612	263.0 -> 219.0	50285	4.99 µg/L	100
PFPeS	5.155	349.0 -> 80.0	9479	5.07 µg/L	100
PFTeDA	9.167	713.0 -> 669.0	61253	4.93 µg/L	99
PFTrDA	8.832	663.0 -> 619.0	63360	4.86 µg/L	99
PFUnDA	8.146	563.0 -> 519.0	51280	5.16 µg/L	99
ADONA	6.061	377.0 -> 251.0	97734	4.74 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	9497	4.79 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	38663	4.73 µg/L	100
HFPO-DA	5.321	329.0 -> 169.0	62836	26.07 µg/L	100

7.64
7

Perfluorinated Compounds by LC/MS/MS

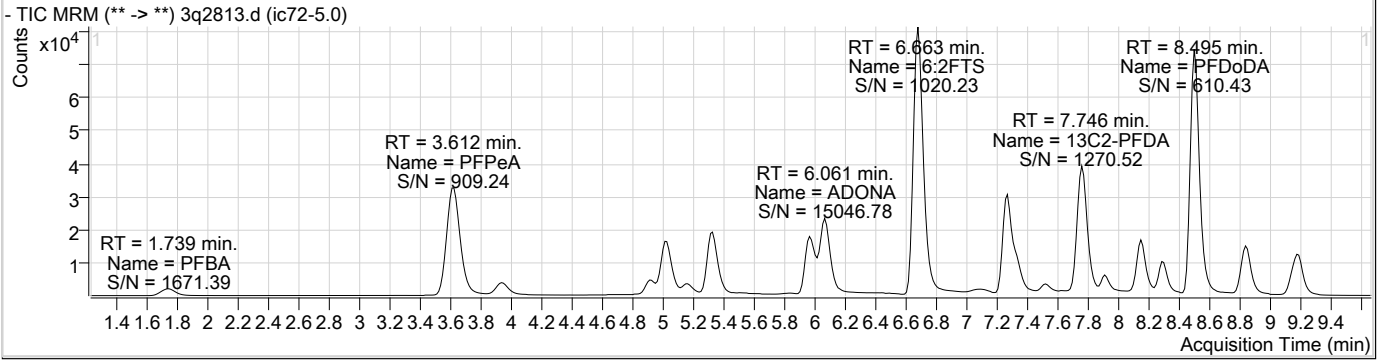
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

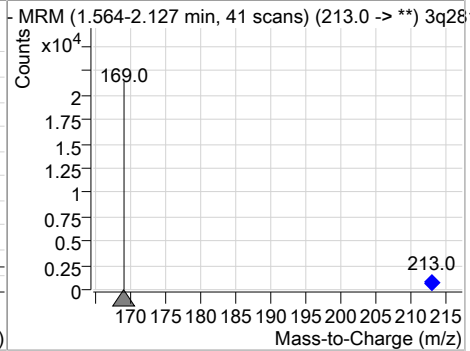
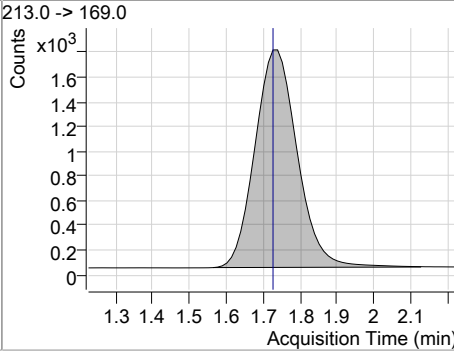
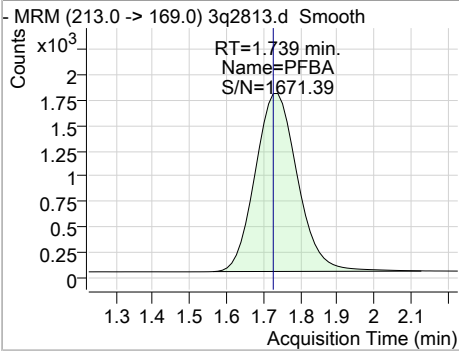
7.6.4

7

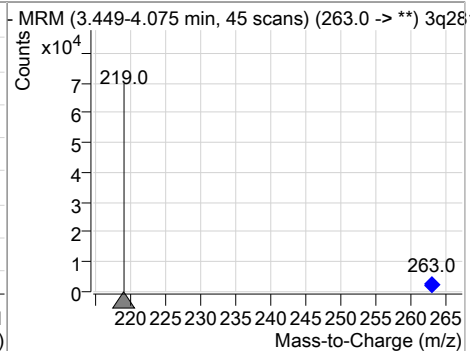
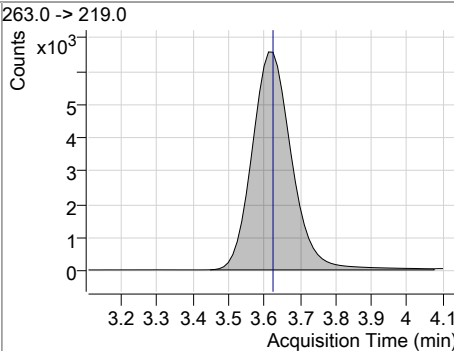
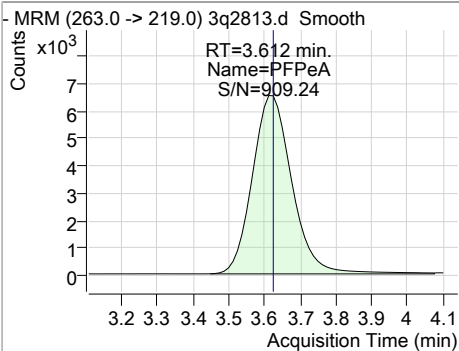
Perfluorinated Compounds by LC/MS/MS



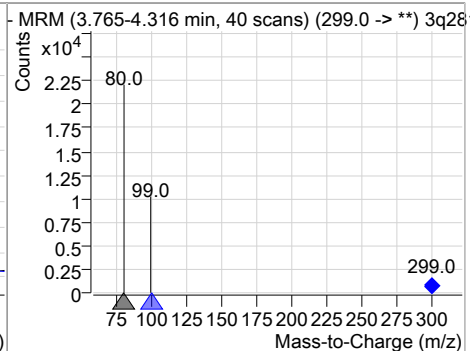
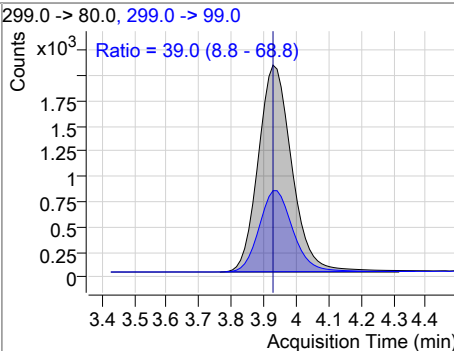
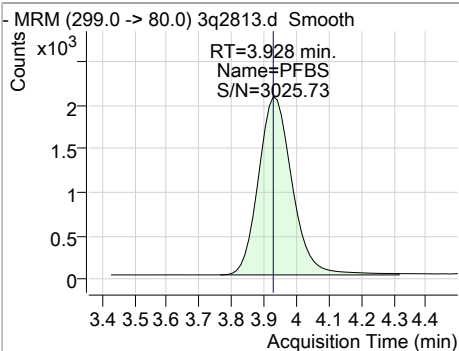
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	4.54	1.74	0.01	14084				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	4.99	3.61	-0.01	50285				



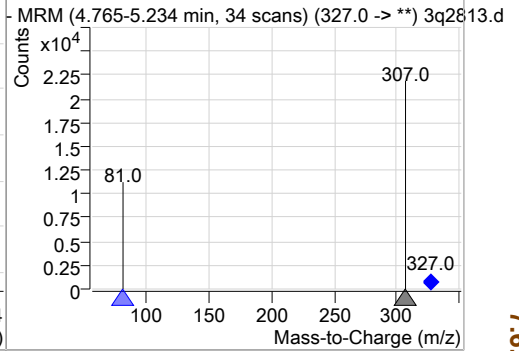
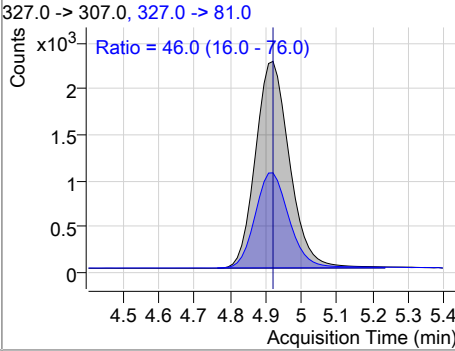
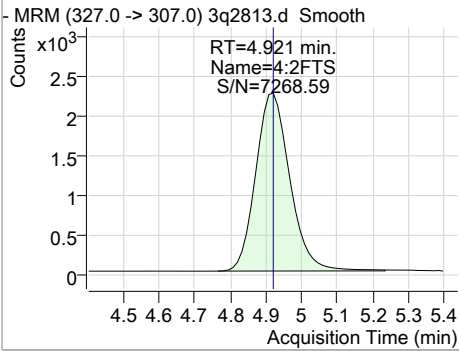
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	4.81	3.93	0.00	14853	299.0 -> 99.0	39.0	8.8	68.8



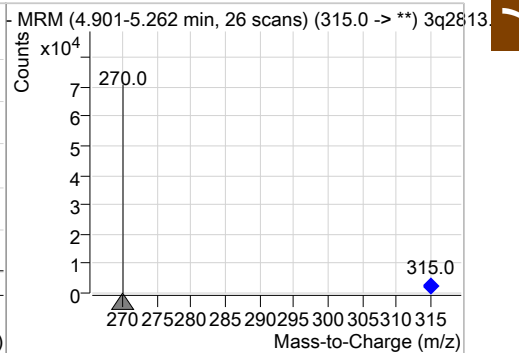
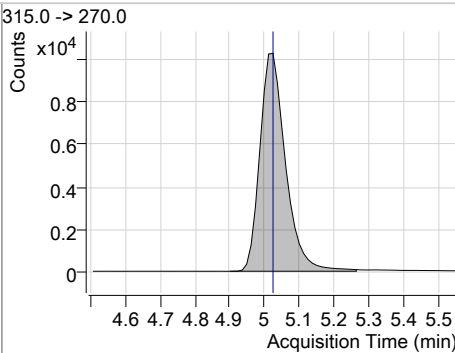
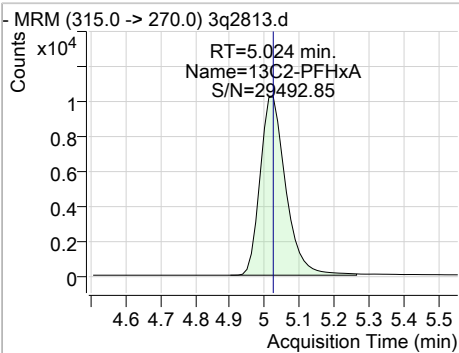
7.6.4
7

Perfluorinated Compounds by LC/MS/MS

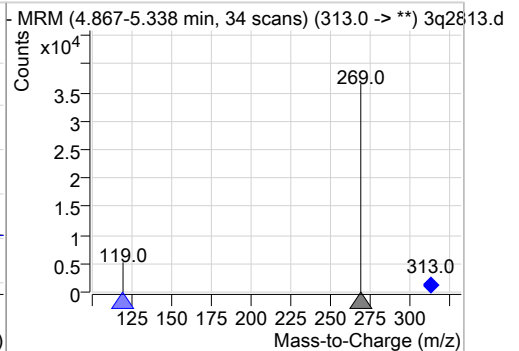
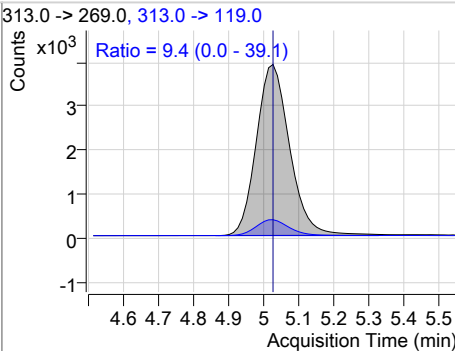
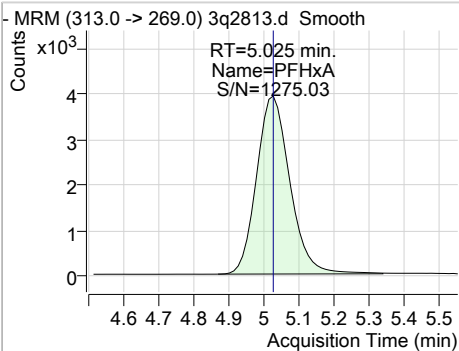
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	5.12	4.92	0.00	14929	327.0 -> 81.0	46.0	16.0	76.0



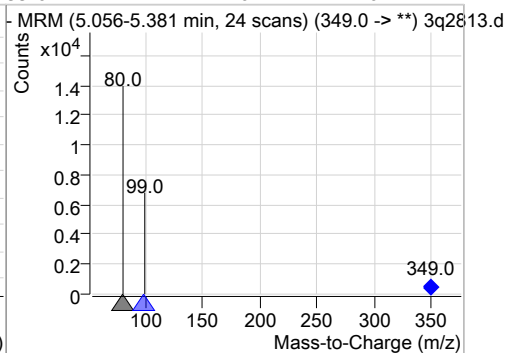
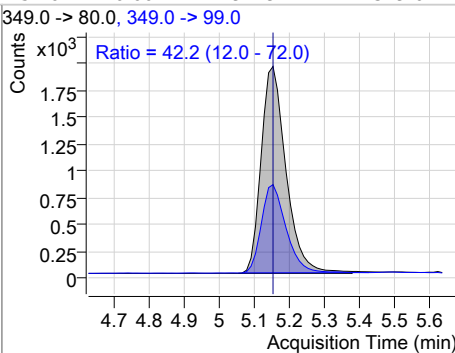
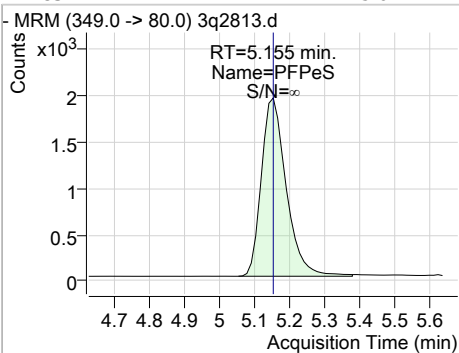
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	5.03	5.02	0.00	52058				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	4.79	5.02	0.00	25771	313.0 -> 119.0	9.4	0.0	39.1

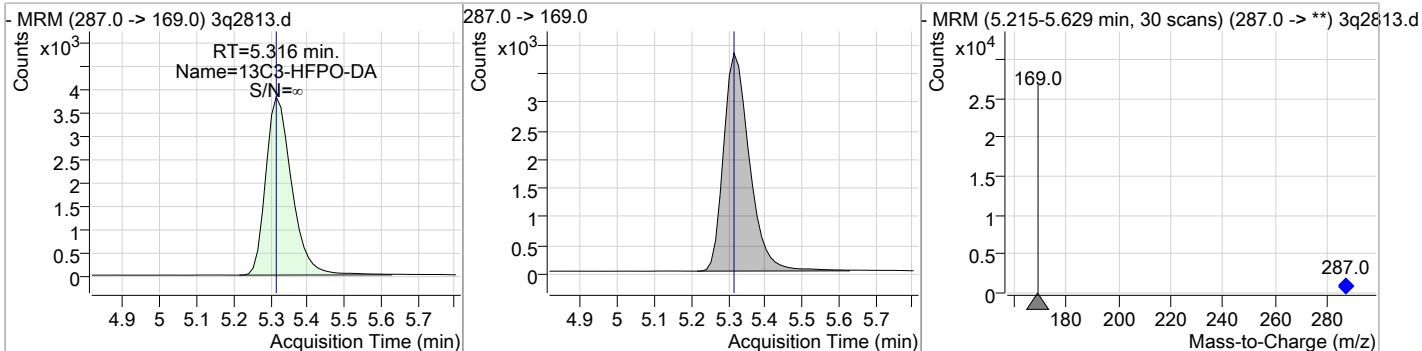


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	5.07	5.16	0.00	9479	349.0 -> 99.0	42.2	12.0	72.0

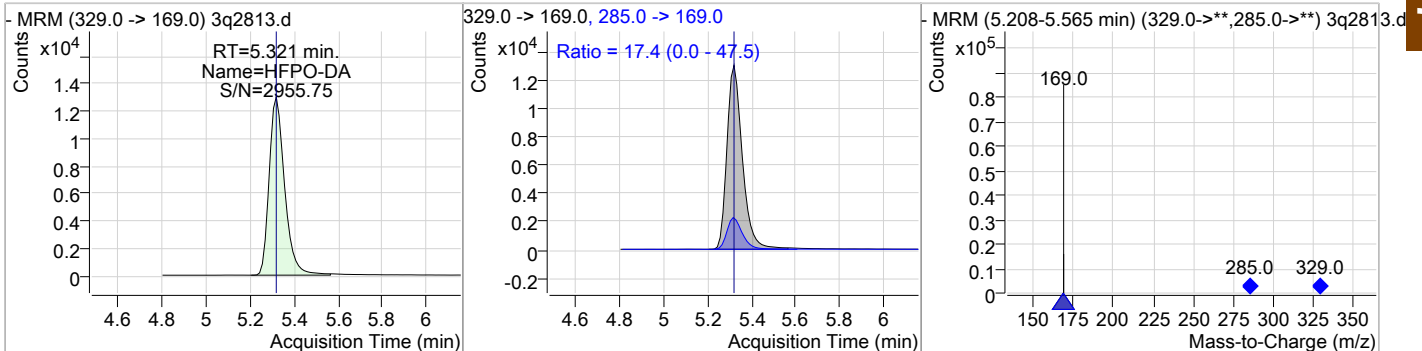


Perfluorinated Compounds by LC/MS/MS

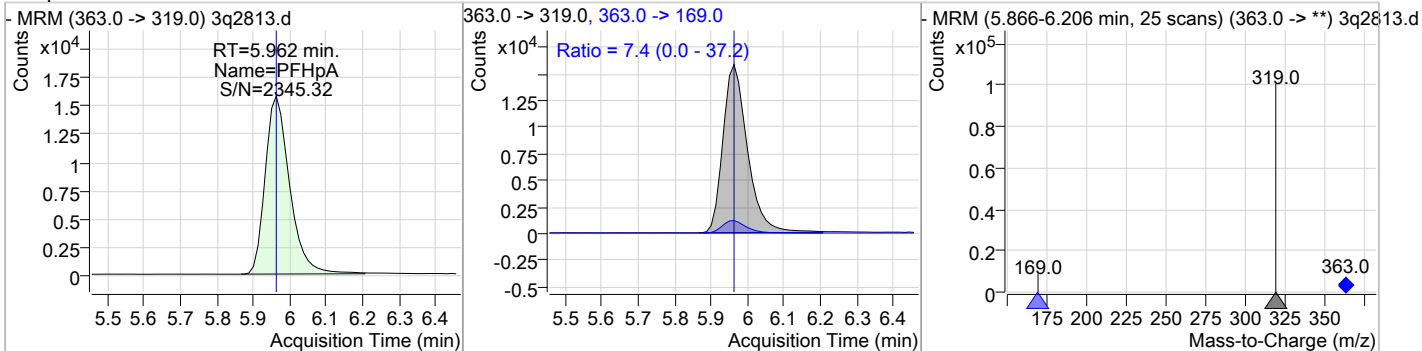
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



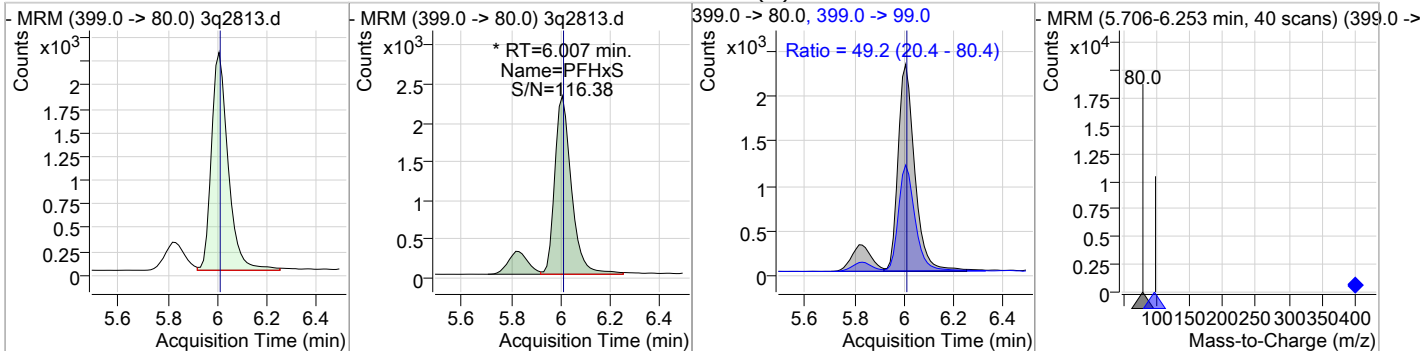
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------

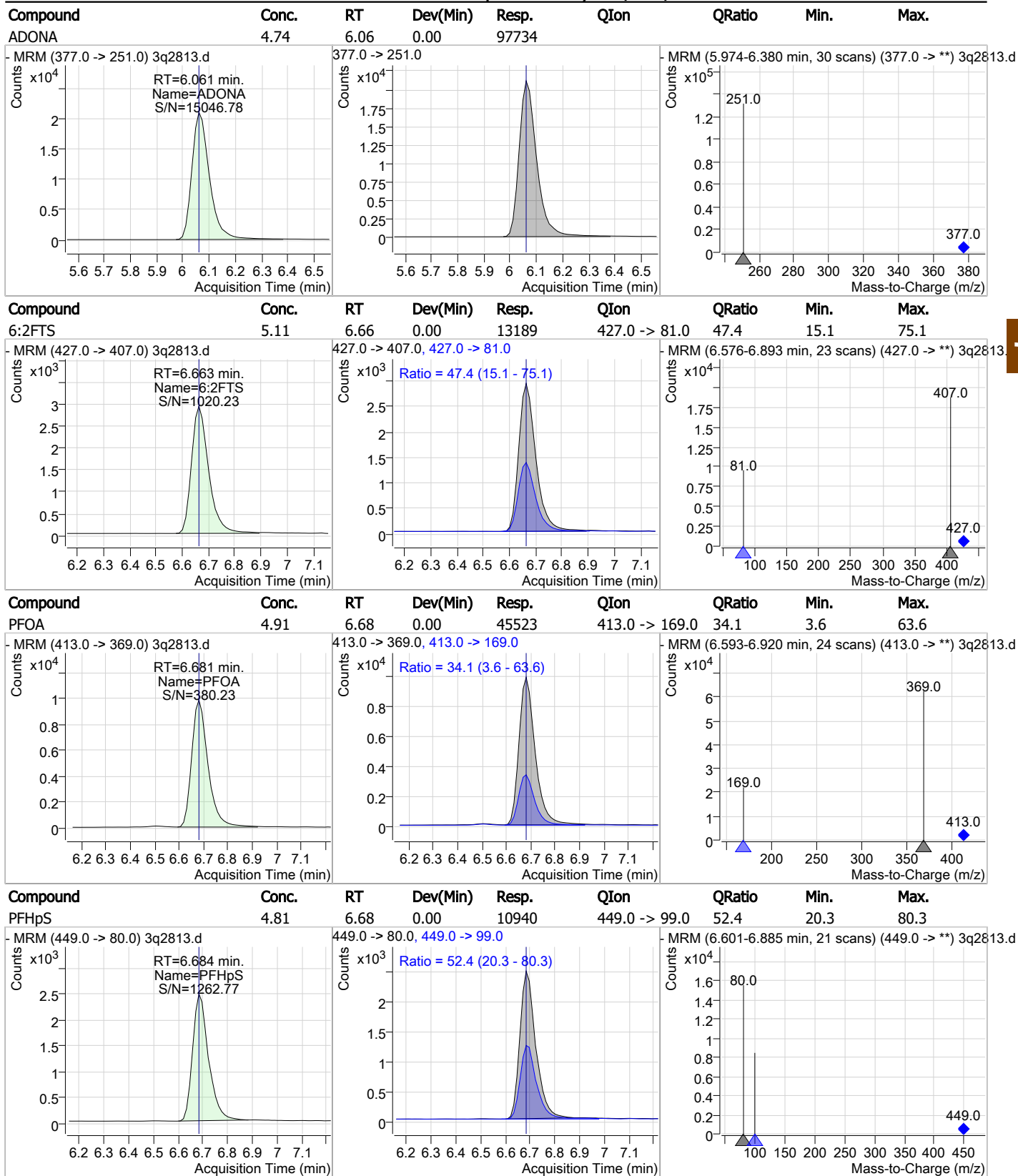


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



7.6.4
7

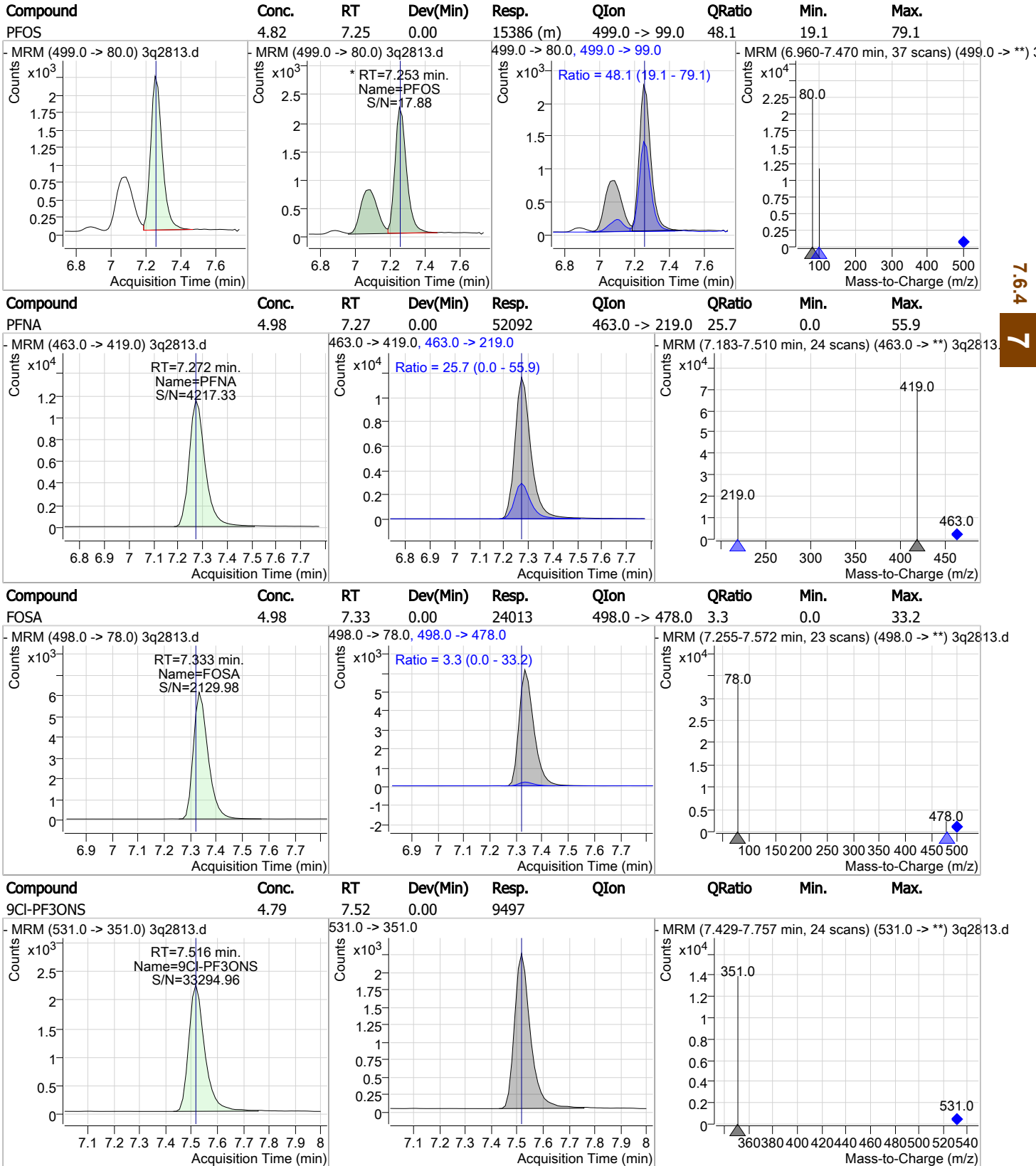
Perfluorinated Compounds by LC/MS/MS



7.6.4

7

Perfluorinated Compounds by LC/MS/MS

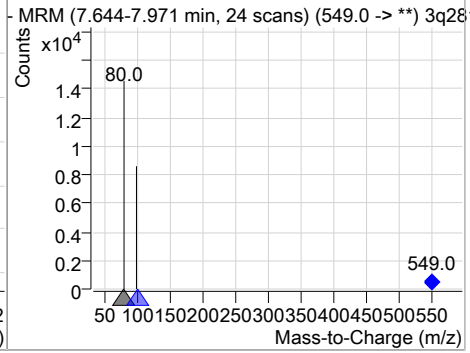
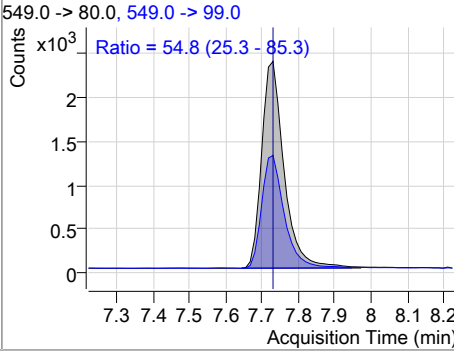
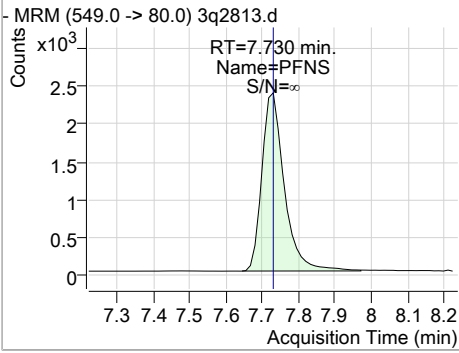


7.6.4

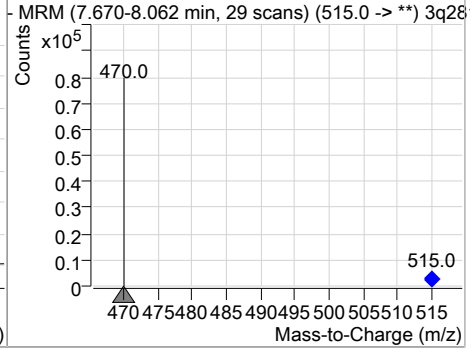
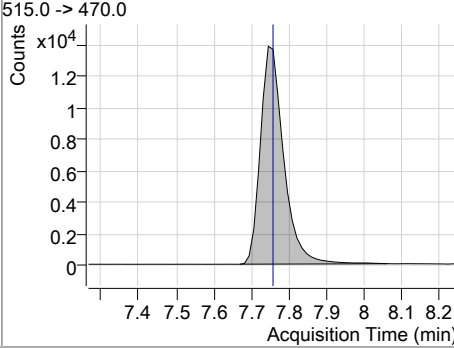
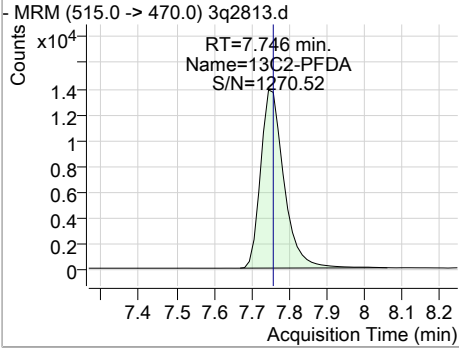
7

Perfluorinated Compounds by LC/MS/MS

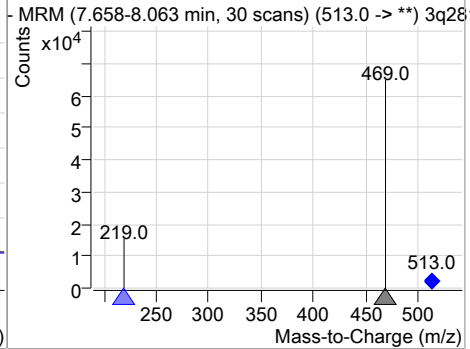
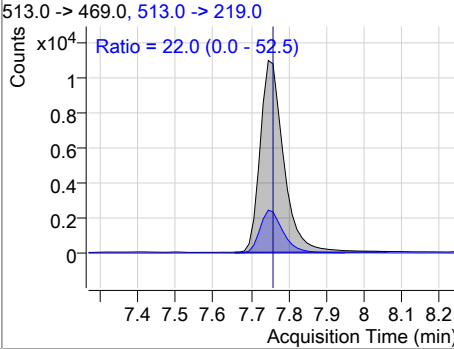
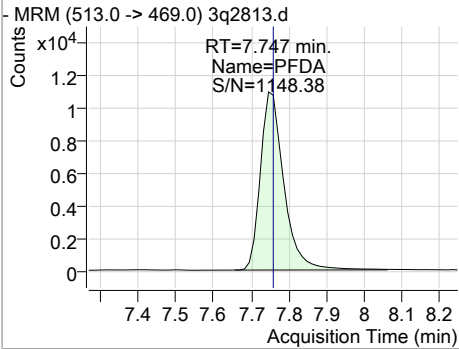
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	5.05	7.73	0.00	10103	549.0 -> 99.0	54.8	25.3	85.3



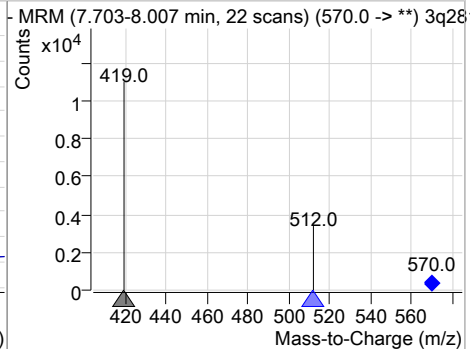
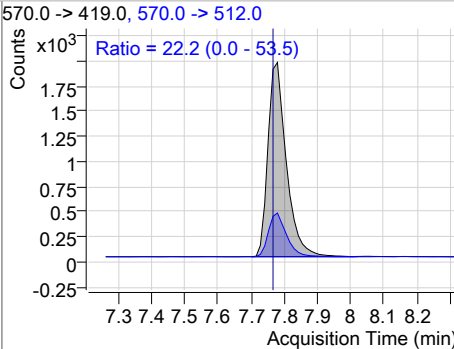
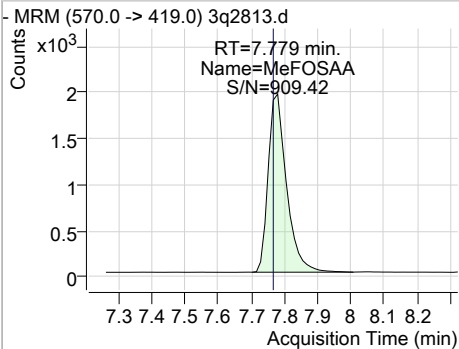
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	5.16	7.75	-0.01	59880	515.0 -> 470.0	22.0	0.0	52.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	5.35	7.75	-0.01	47568	513.0 -> 219.0	22.0	0.0	52.5



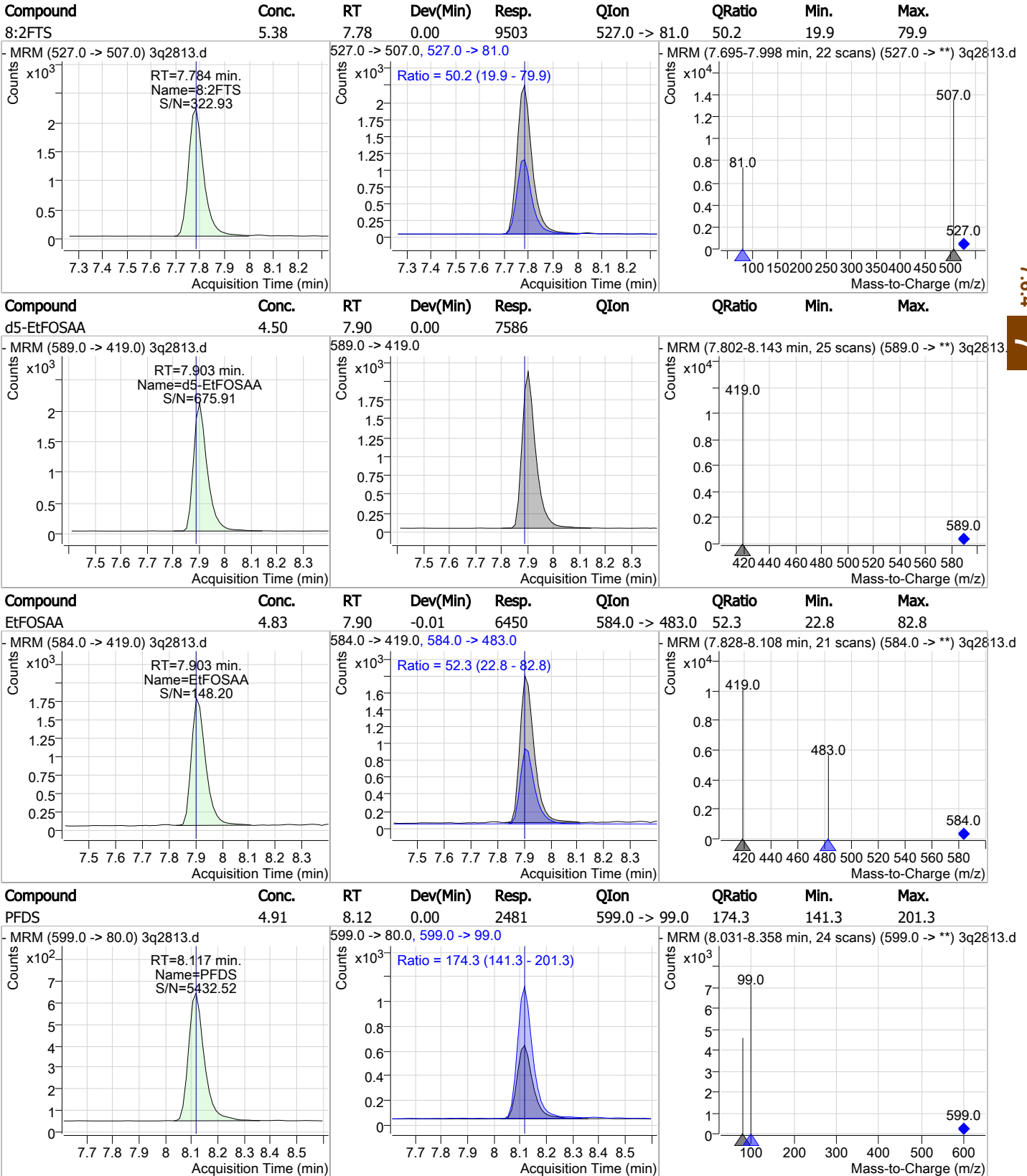
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	4.73	7.78	0.00	7441	570.0 -> 512.0	22.2	0.0	53.5



7.6.4
7



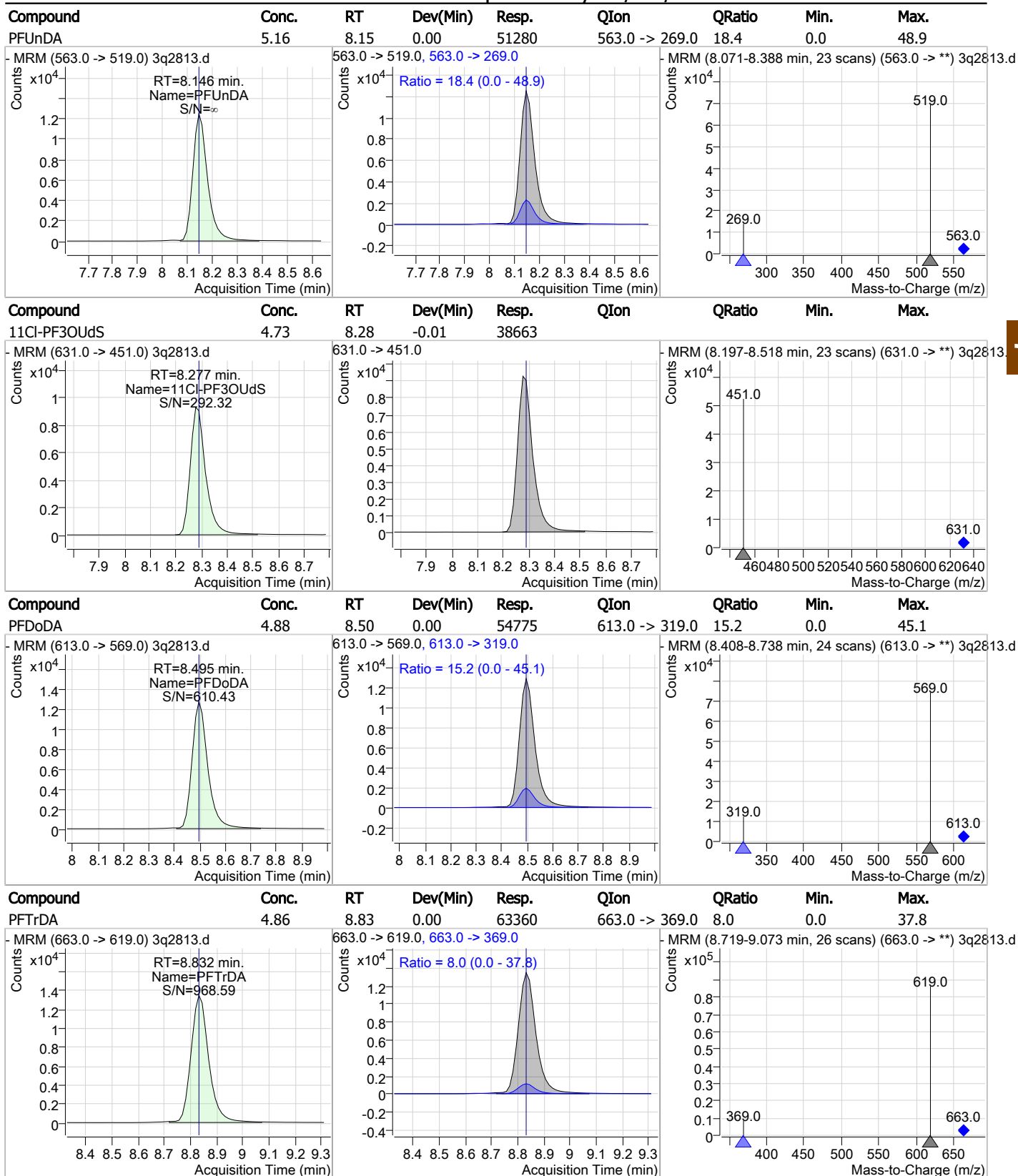
Perfluorinated Compounds by LC/MS/MS



7.6.4

7

Perfluorinated Compounds by LC/MS/MS

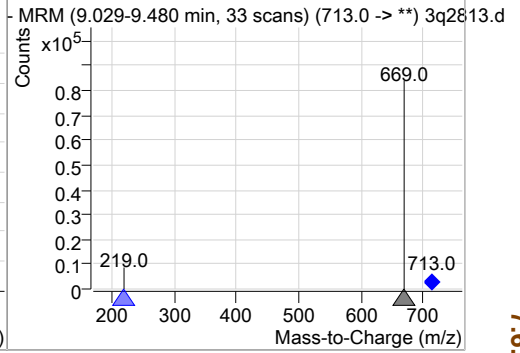
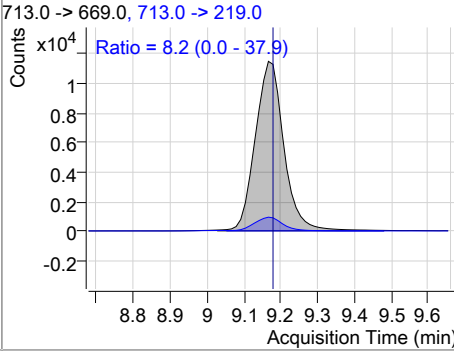
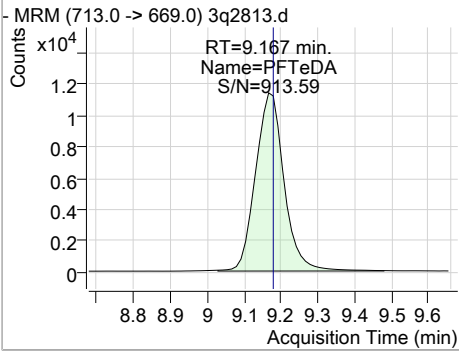


7.6.4

7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	4.93	9.17	-0.01	61253	713.0 -> 219.0	8.2	0.0	37.9



7.6.4

7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2813.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 15:48 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.4.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
 04/12/19 17:21

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2814.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 4:03:20 PM
 Sample Name : ic72-10
 Vial : P1-A6
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	51474	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	244104	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	219799	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	150018	20.00 µg/L	0.000
13C4-PFOS	7.268	503.0 -> 80.0	55334	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	27790	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	116599	10.52 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 52.6%	
13C2-PFHxA	5.024	315.0 -> 270.0	100076	10.07 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 50.3%	
d5-EtFOSAA	7.903	589.0 -> 419.0	15023	9.32 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 46.6%	
13C3-HFPO-DA	5.316	287.0 -> 169.0	34933	51.45 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 51.4%	
Target Compounds					
4:2FTS	4.921	327.0 -> 307.0	28392	10.19 µg/L	QValue 100
6:2FTS	6.663	427.0 -> 407.0	25880	10.48 µg/L	99
8:2FTS	7.784	527.0 -> 507.0	17673	10.46 µg/L	97
EtFOSAA	7.916	584.0 -> 419.0	12590	9.80 µg/L	99
FOSA	7.346	498.0 -> 78.0	46670	10.10 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	13886	9.22 µg/L	99
PFBA	1.726	213.0 -> 169.0	27375	9.21 µg/L	100
PFBS	3.928	299.0 -> 80.0	28135	9.58 µg/L	99
PFDA	7.759	513.0 -> 469.0	91927	10.79 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	106426	9.95 µg/L	99
PFDS	8.117	599.0 -> 80.0	4869	10.13 µg/L	99
PFHpA	5.962	363.0 -> 319.0	141754	9.47 µg/L	100
PFHpS	6.696	449.0 -> 80.0	21500	9.93 µg/L	100
PFHxA	5.025	313.0 -> 269.0	49249	9.56 µg/L	100
PFHxS	6.007	399.0 -> 80.0	23084	9.67 µg/L	m 99
PFNA	7.272	463.0 -> 419.0	100671	10.06 µg/L	100
PFNS	7.730	549.0 -> 80.0	19467	10.24 µg/L	98
PFOA	6.681	413.0 -> 369.0	87473	9.86 µg/L	99
PFOS	7.269	499.0 -> 80.0	30185	9.95 µg/L	m 97
PFPeA	3.612	263.0 -> 219.0	96018	9.94 µg/L	100
PFPeS	5.155	349.0 -> 80.0	18095	10.09 µg/L	99
PFTeDA	9.167	713.0 -> 669.0	117093	9.89 µg/L	99
PFTrDA	8.832	663.0 -> 619.0	124064	9.98 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	98958	10.45 µg/L	99
ADONA	6.061	377.0 -> 251.0	188388	9.54 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	17611	9.29 µg/L	100
11Cl-PF3OUds	8.290	631.0 -> 451.0	74051	9.47 µg/L	100
HFPO-DA	5.321	329.0 -> 169.0	118562	51.59 µg/L	99

7.65
7



Perfluorinated Compounds by LC/MS/MS

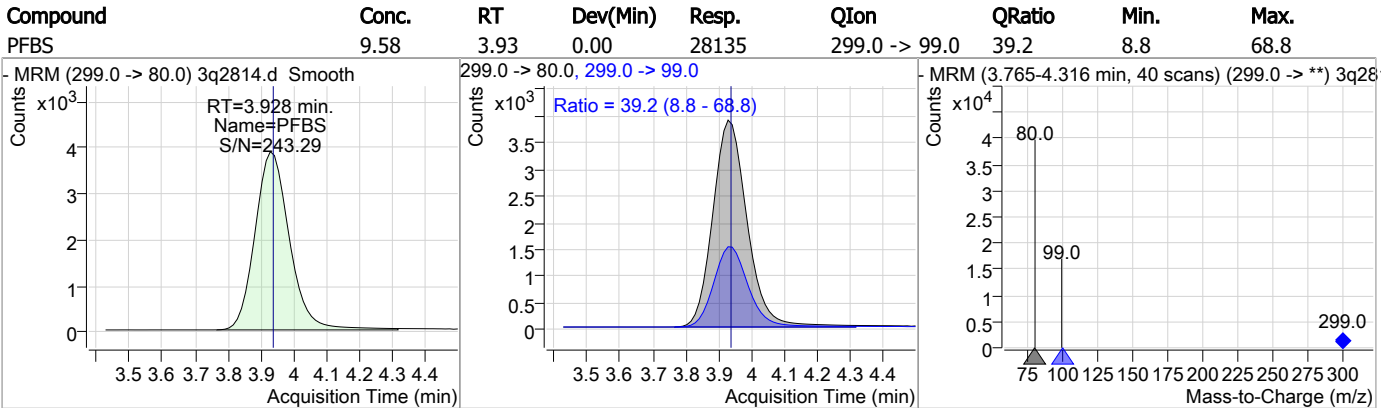
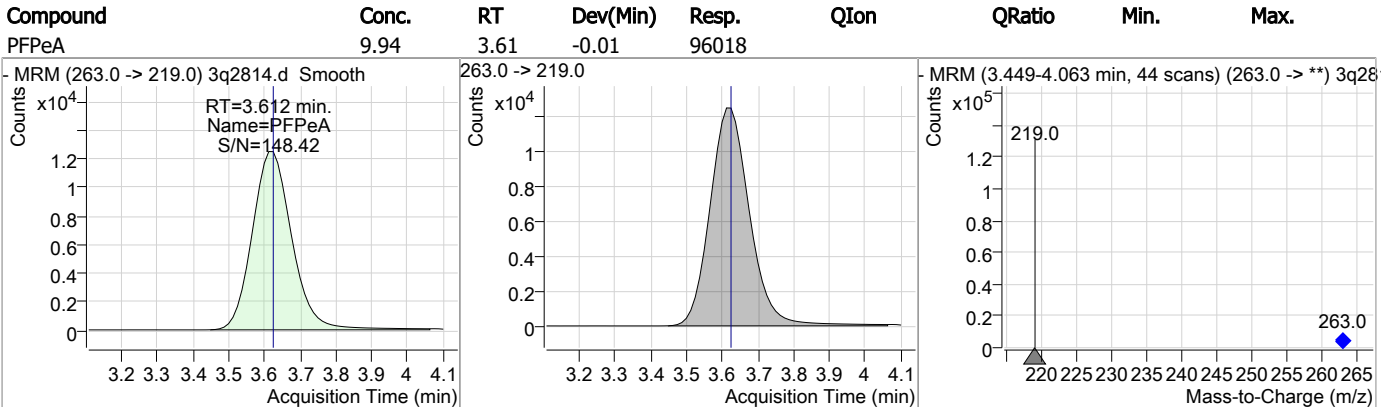
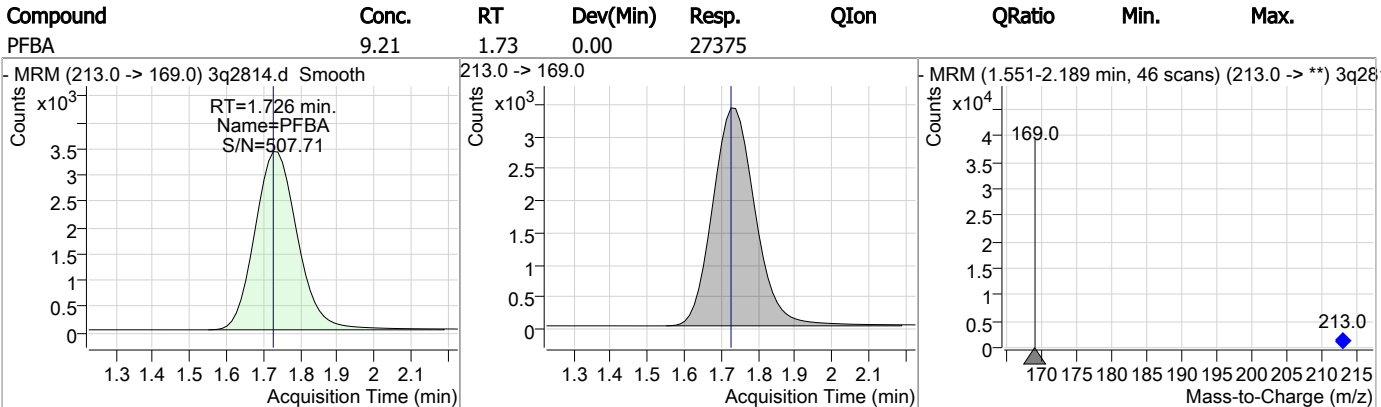
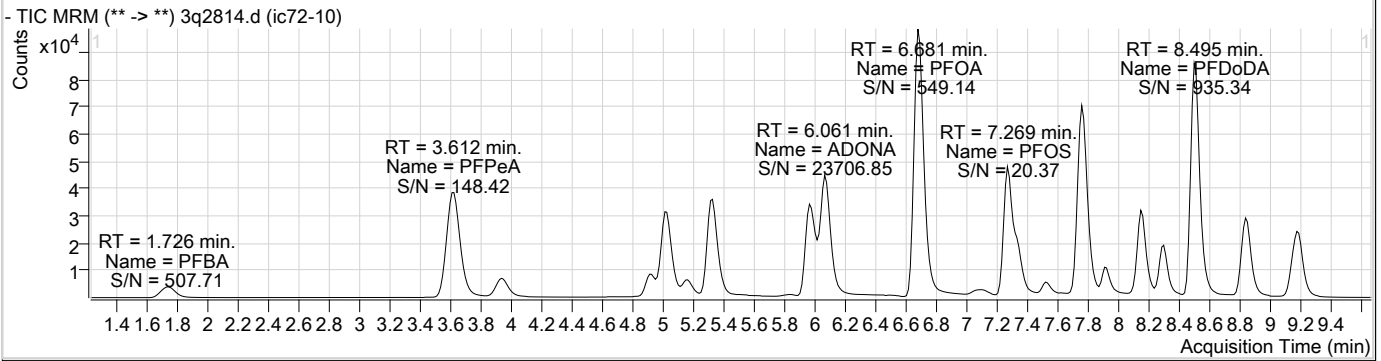
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

7.6.5

7

Perfluorinated Compounds by LC/MS/MS

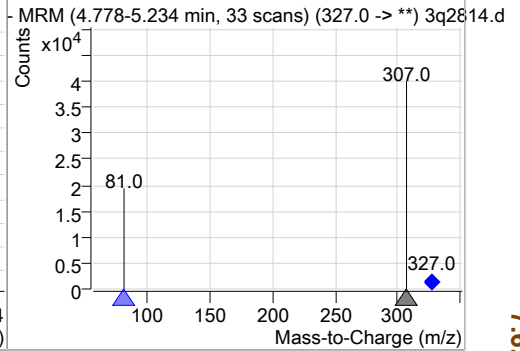
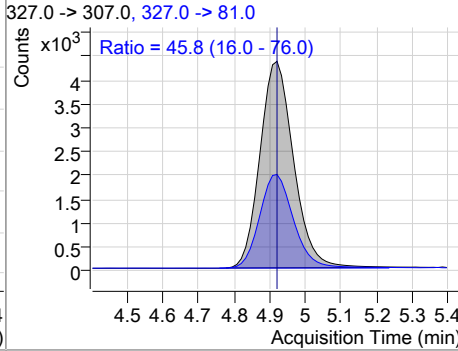
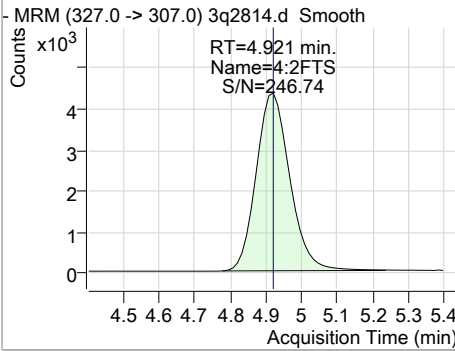


7.6.5
7

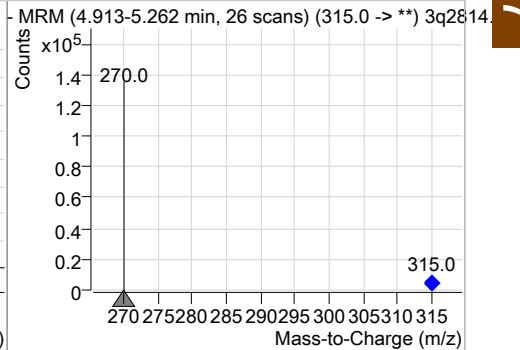
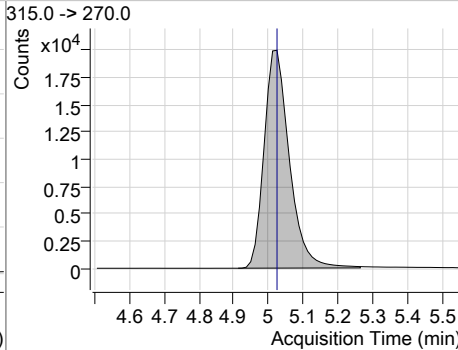
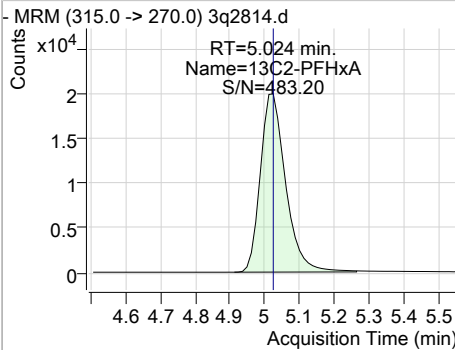


Perfluorinated Compounds by LC/MS/MS

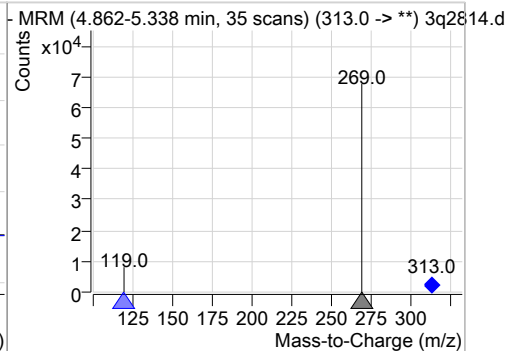
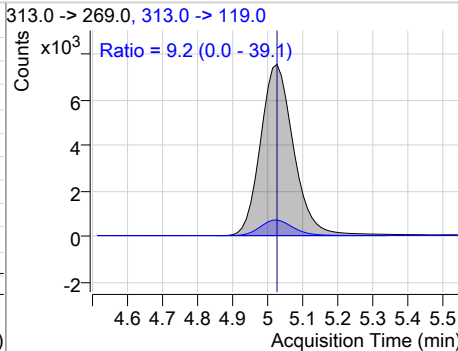
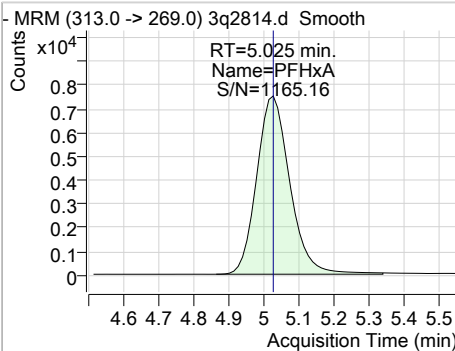
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	10.19	4.92	0.00	28392	327.0 -> 81.0	45.8	16.0	76.0



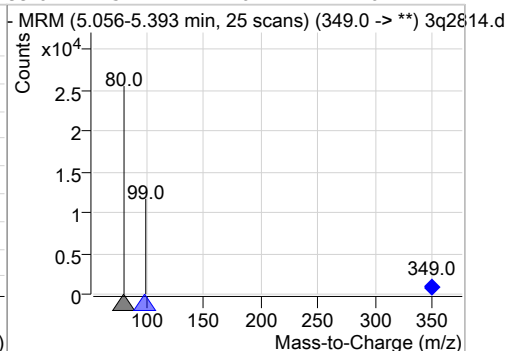
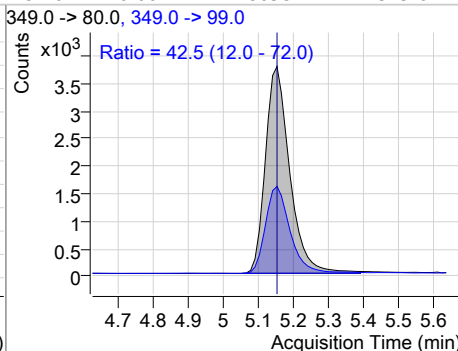
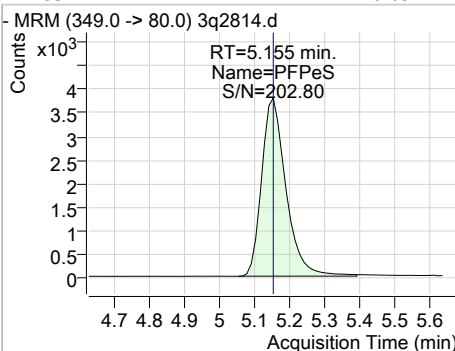
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	10.07	5.02	0.00	100076				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	9.56	5.02	0.00	49249	313.0 -> 119.0	9.2	0.0	39.1

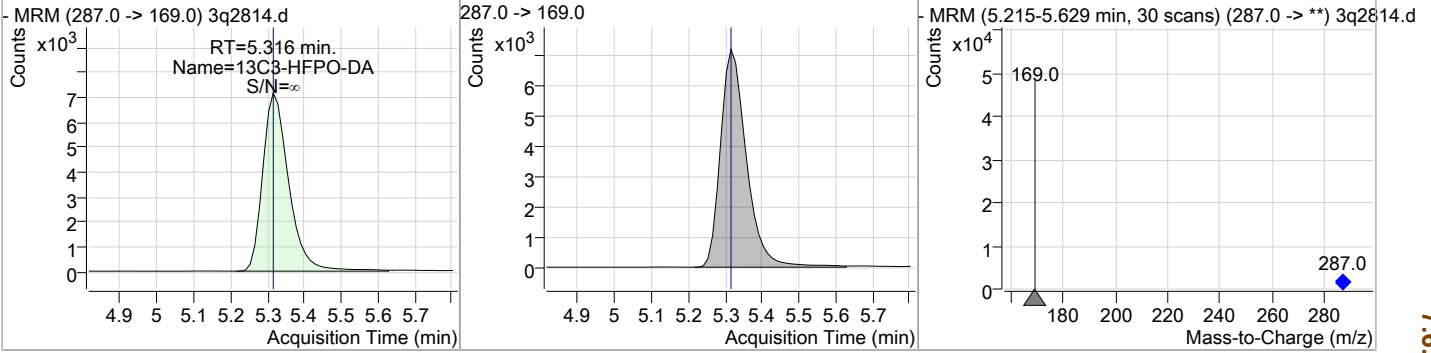


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	10.09	5.16	0.00	18095	349.0 -> 99.0	42.5	12.0	72.0

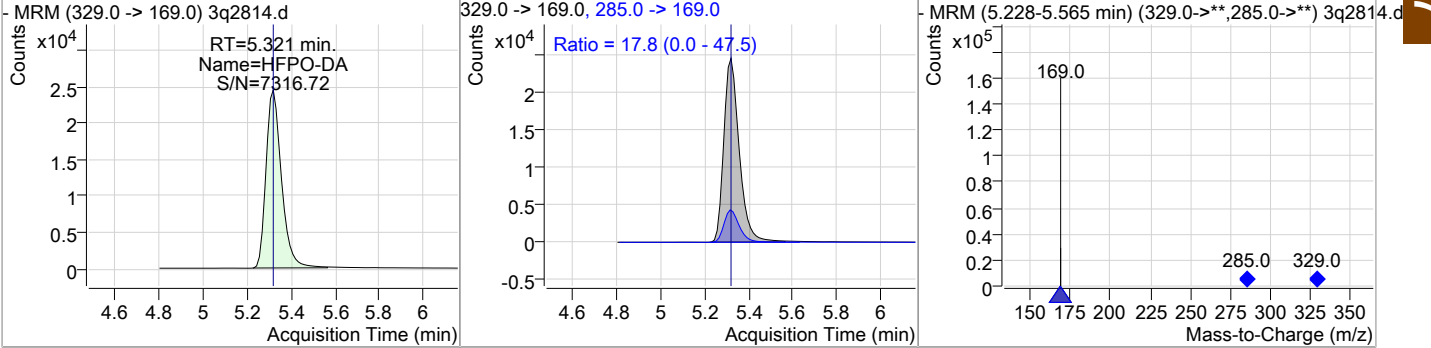


Perfluorinated Compounds by LC/MS/MS

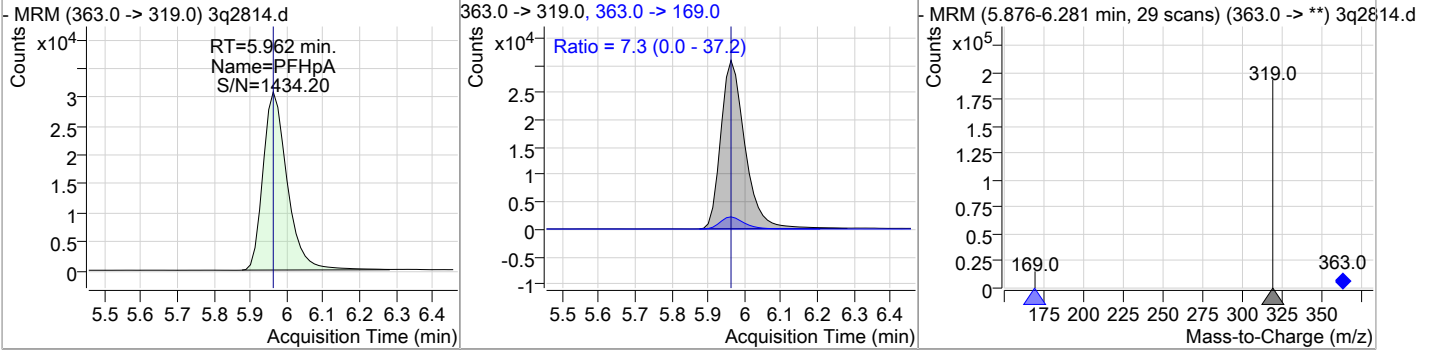
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	51.45	5.32	0.00	34933				



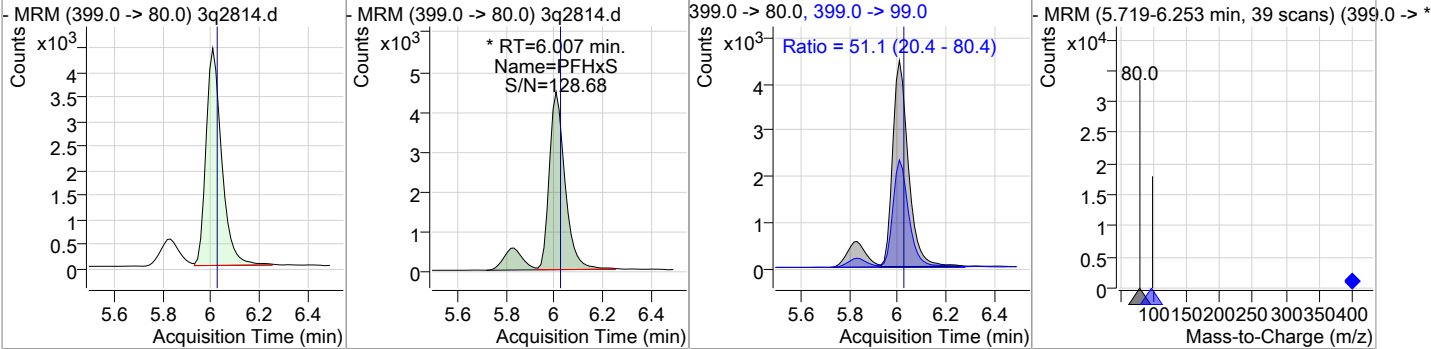
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	51.59	5.32	0.00	118562	285.0 -> 169.0	17.8	0.0	47.5



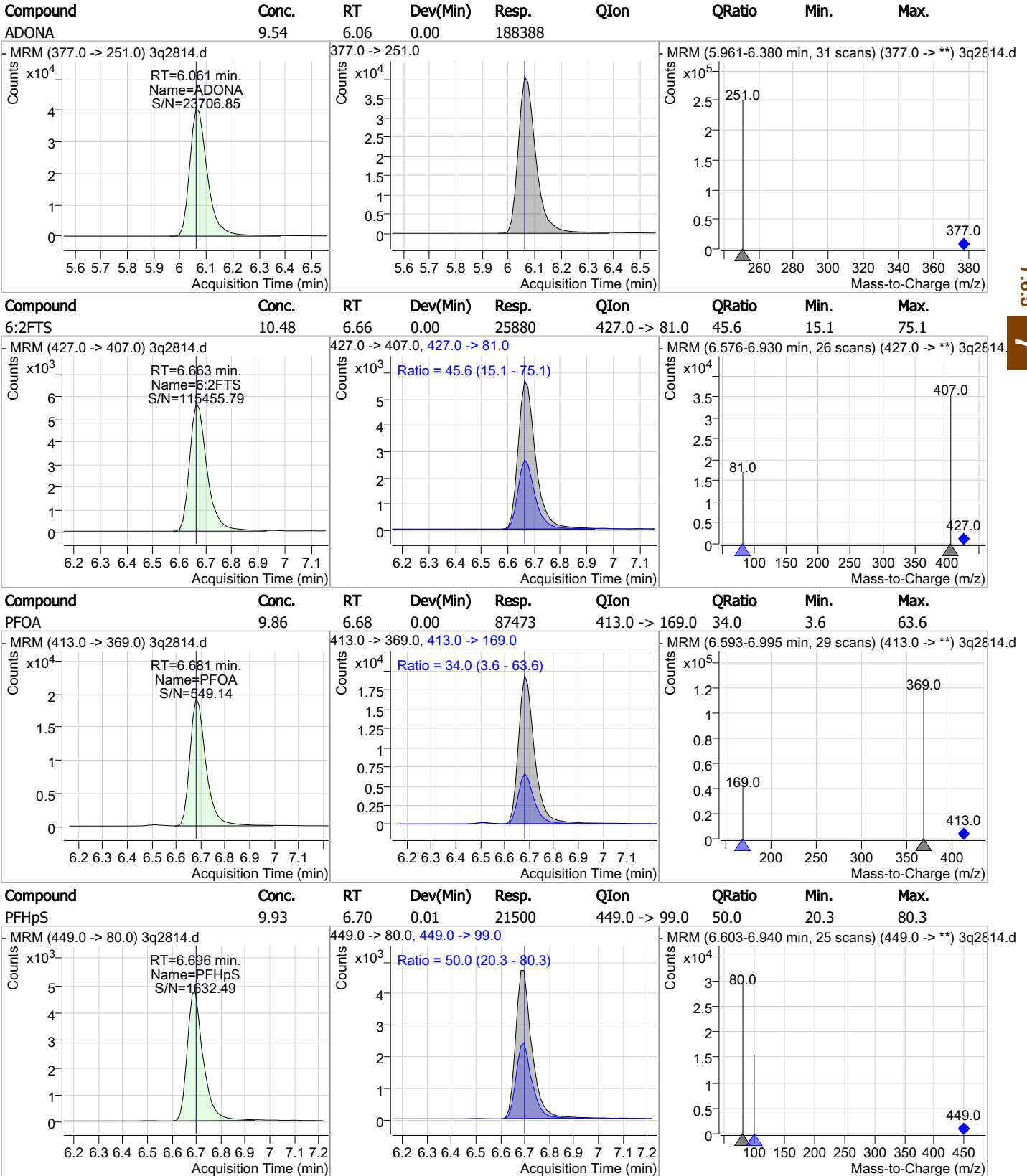
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	9.47	5.96	0.00	141754	363.0 -> 169.0	7.3	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	9.67	6.01	0.00	23084 (m)	399.0 -> 99.0	51.1	20.4	80.4



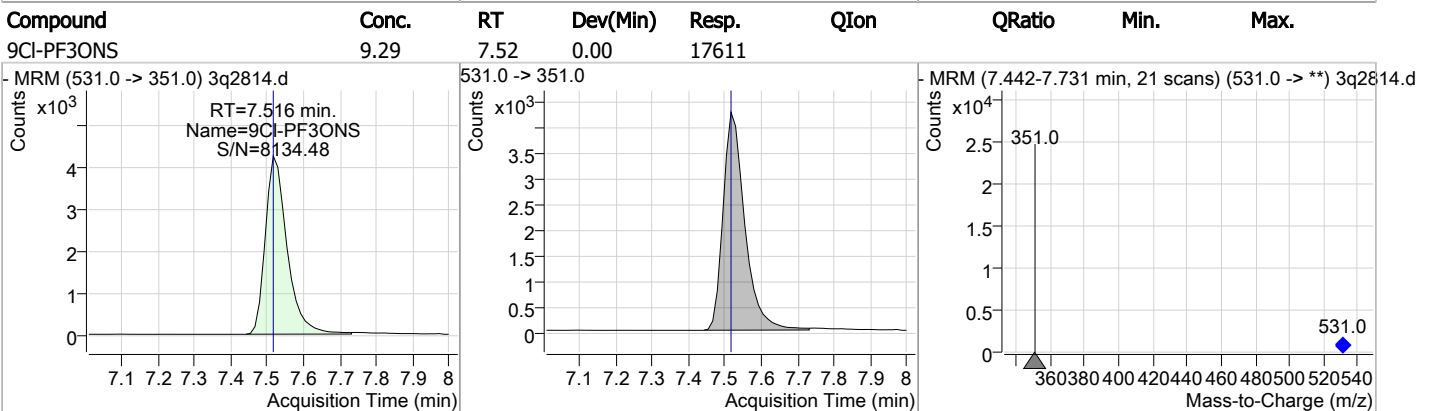
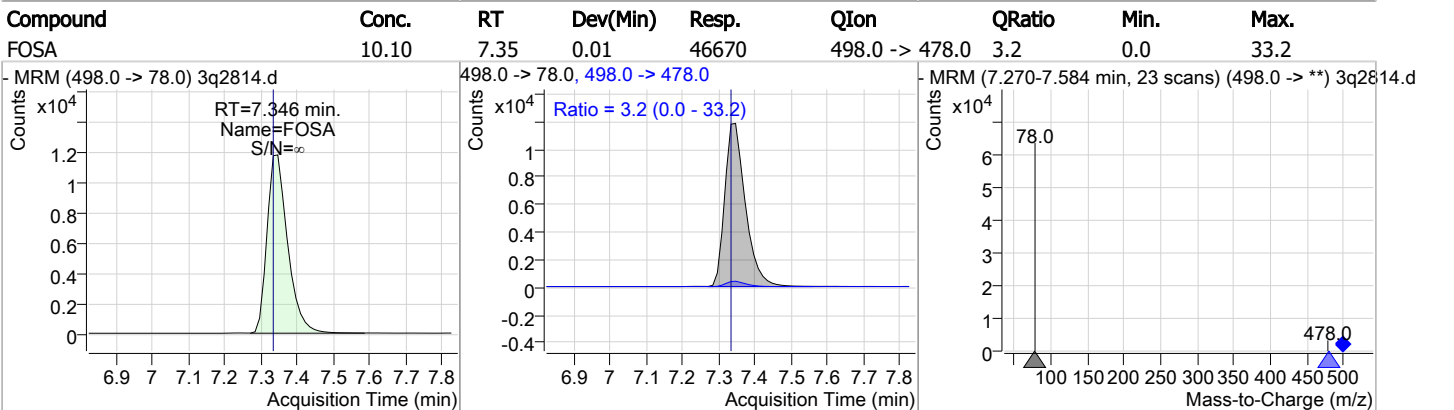
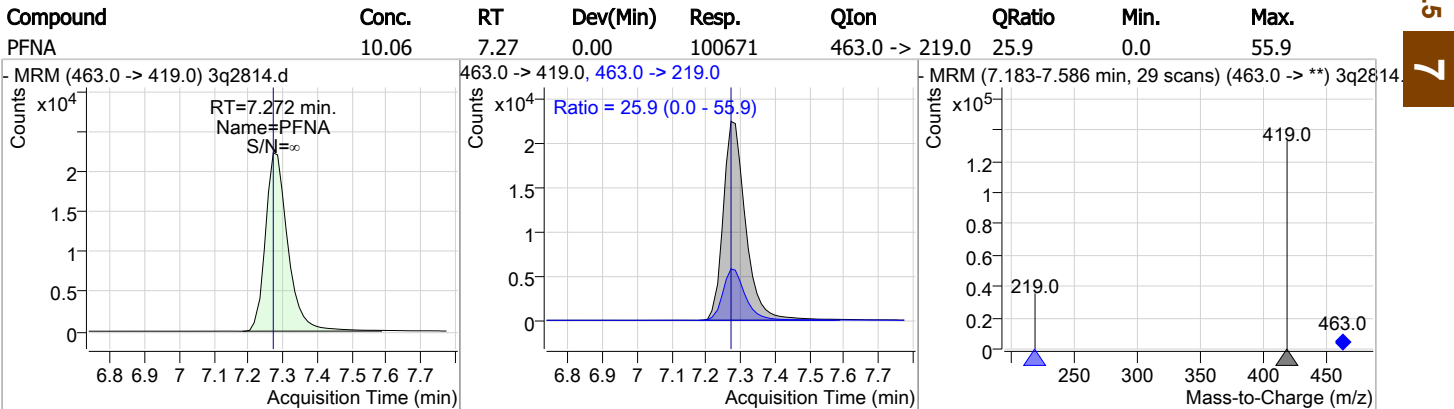
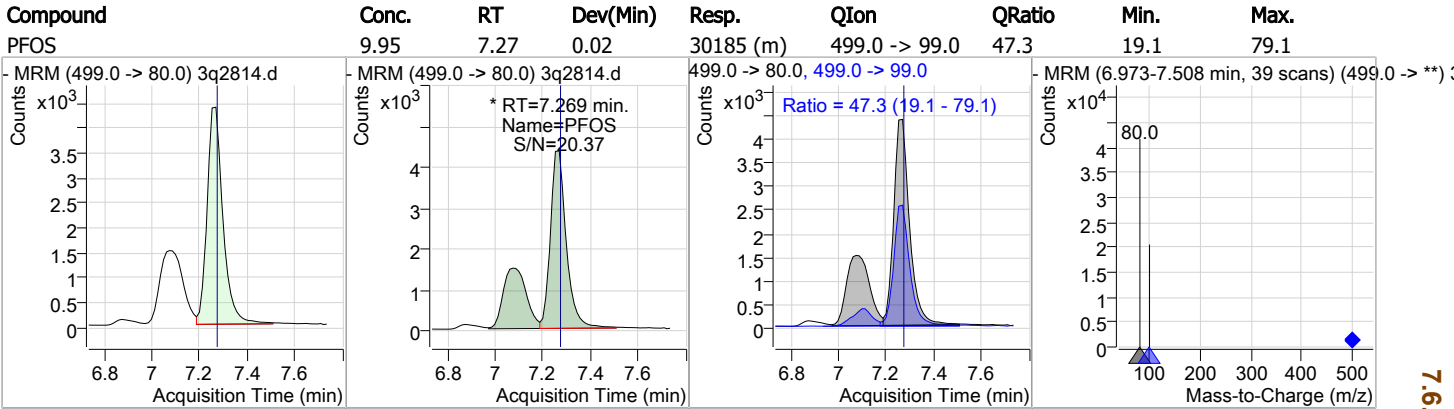
Perfluorinated Compounds by LC/MS/MS



7.6.5
7

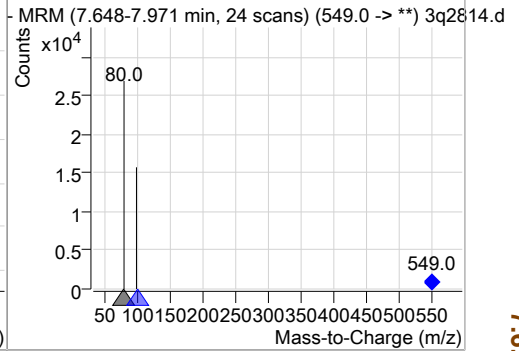
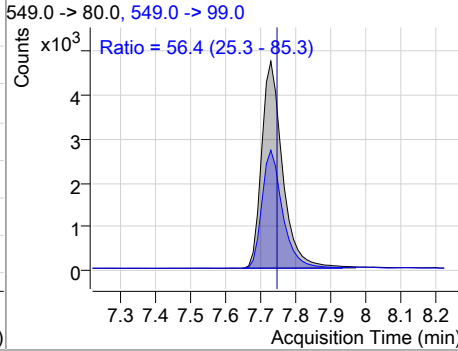
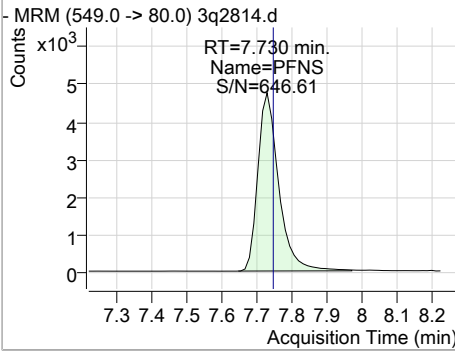


Perfluorinated Compounds by LC/MS/MS

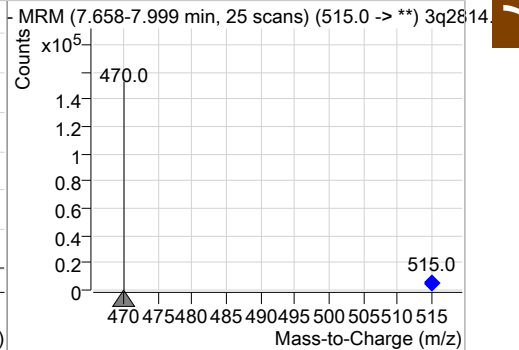
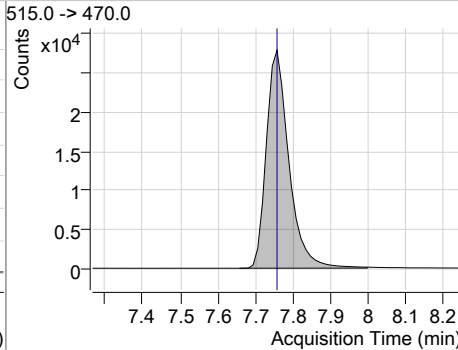
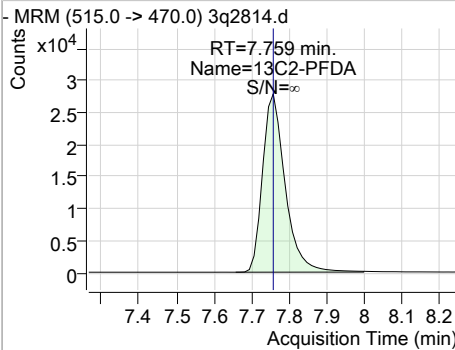


Perfluorinated Compounds by LC/MS/MS

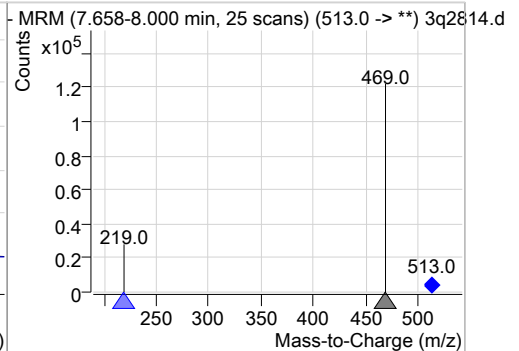
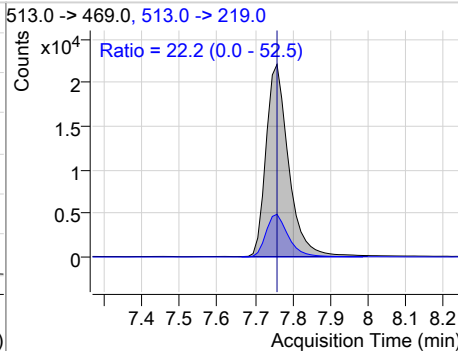
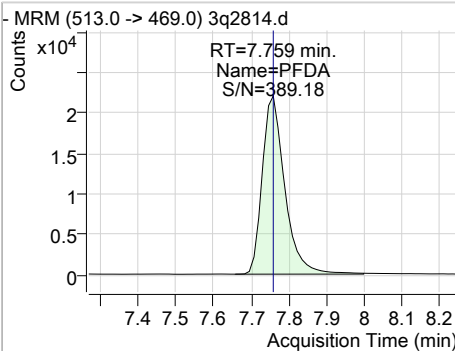
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	10.24	7.73	0.00	19467	549.0 -> 99.0	56.4	25.3	85.3



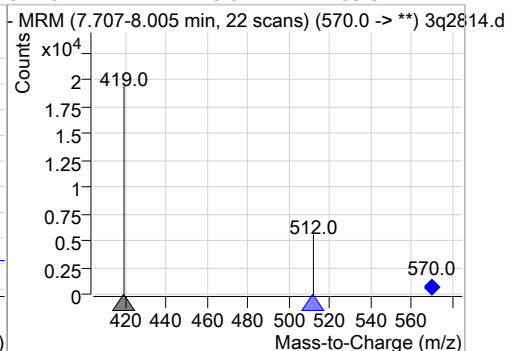
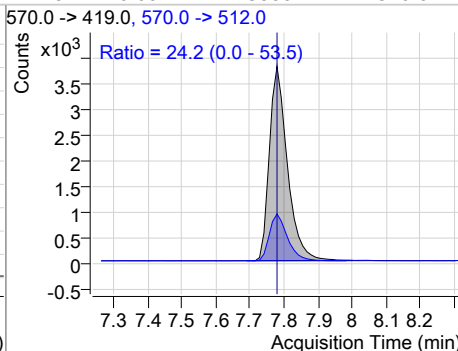
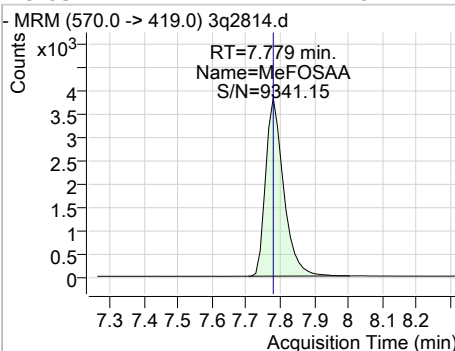
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	10.52	7.76	0.00	116599	515.0 -> 470.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	10.79	7.76	0.00	91927	513.0 -> 219.0	22.2	0.0	52.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	9.22	7.78	0.00	13886	570.0 -> 512.0	24.2	0.0	53.5



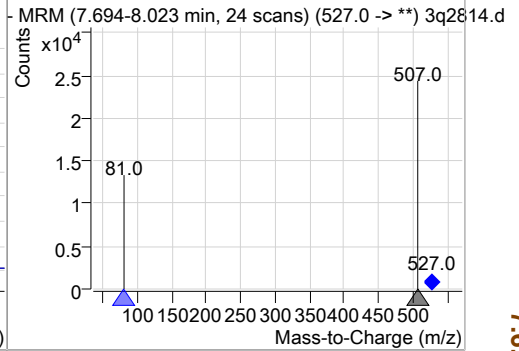
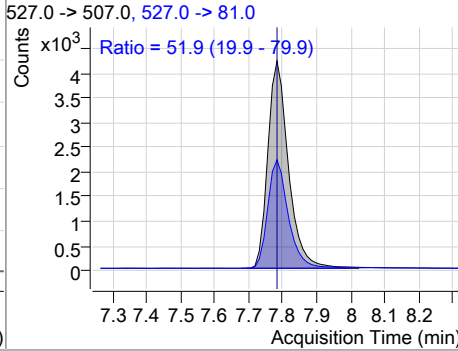
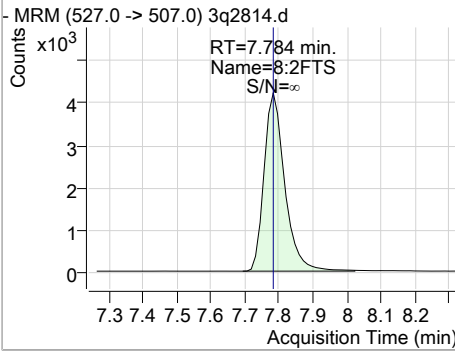
7.6.5

7

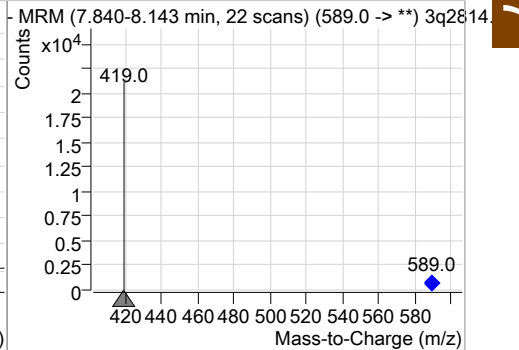
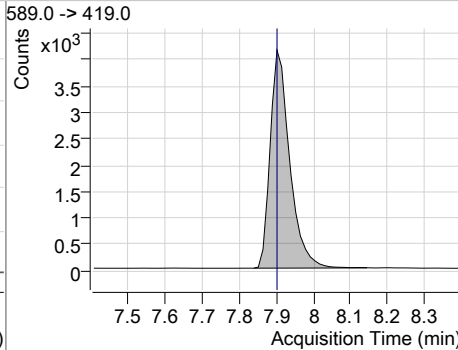
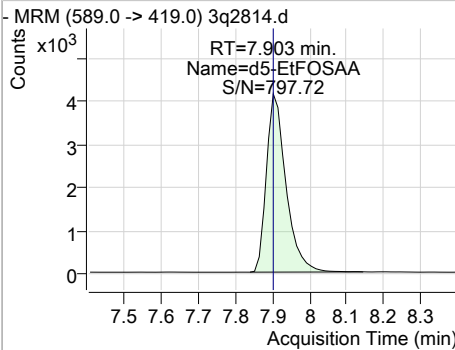


Perfluorinated Compounds by LC/MS/MS

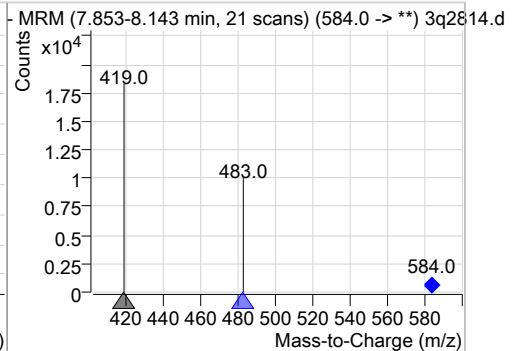
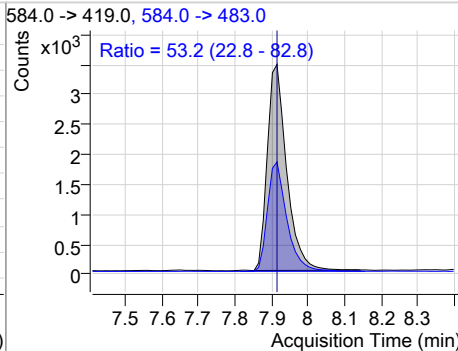
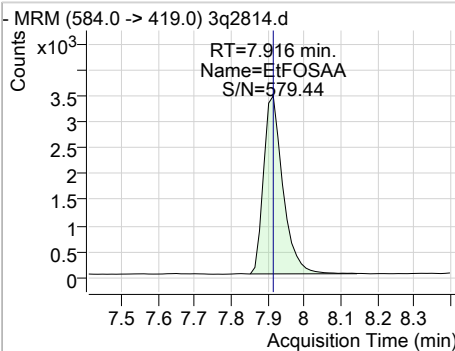
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	10.46	7.78	0.00	17673	527.0 -> 81.0	51.9	19.9	79.9



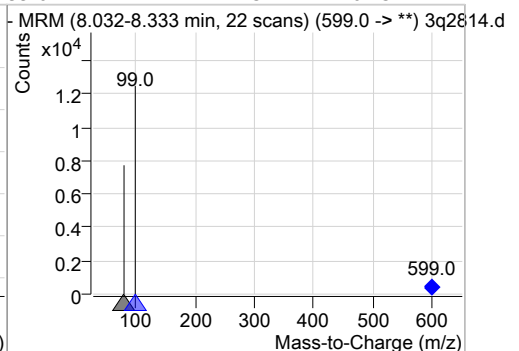
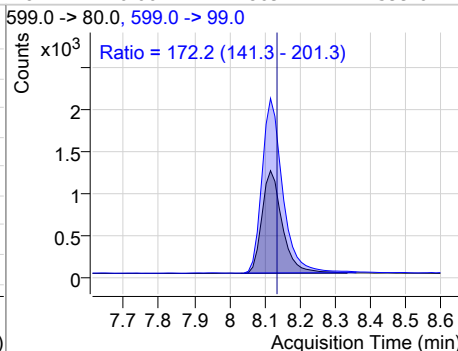
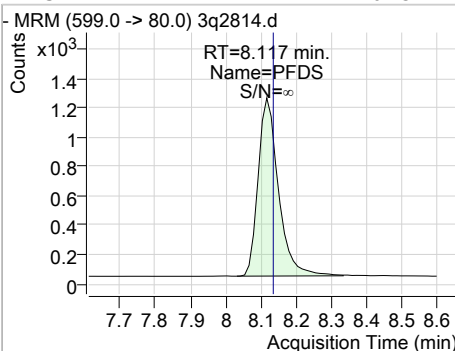
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	9.32	7.90	0.00	15023	589.0 -> 419.0	53.2	22.8	82.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	9.80	7.92	0.00	12590	584.0 -> 483.0	53.2	22.8	82.8

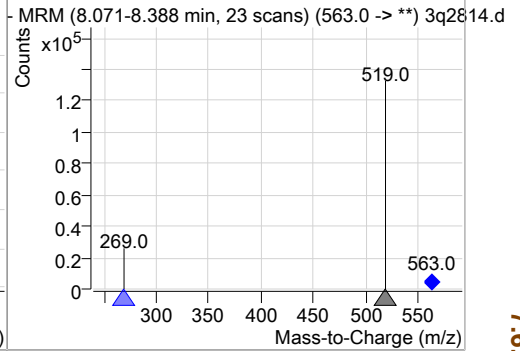
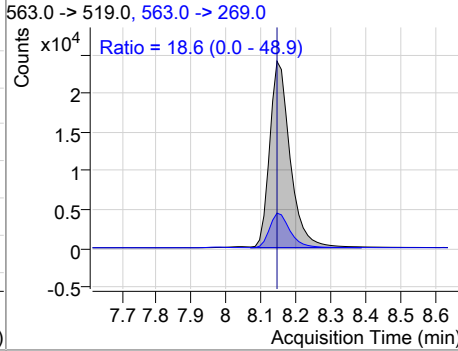
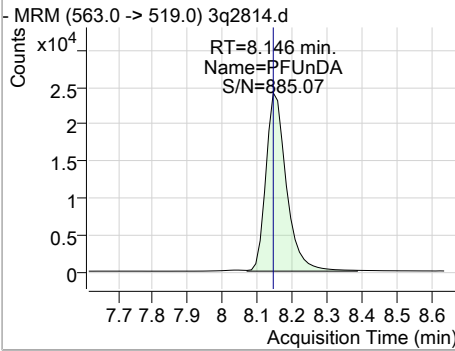


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	10.13	8.12	0.00	4869	599.0 -> 99.0	172.2	141.3	201.3

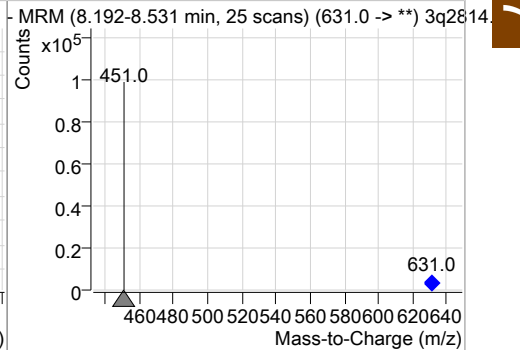
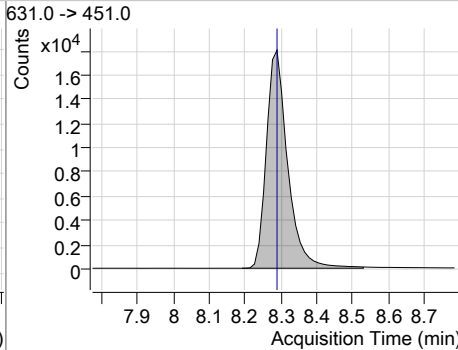
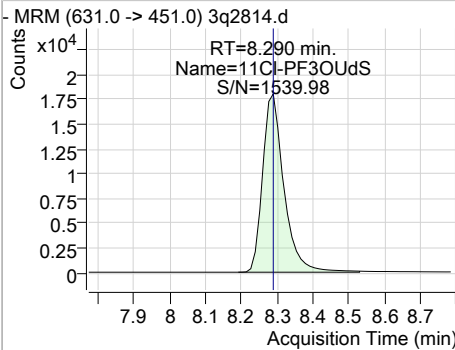


Perfluorinated Compounds by LC/MS/MS

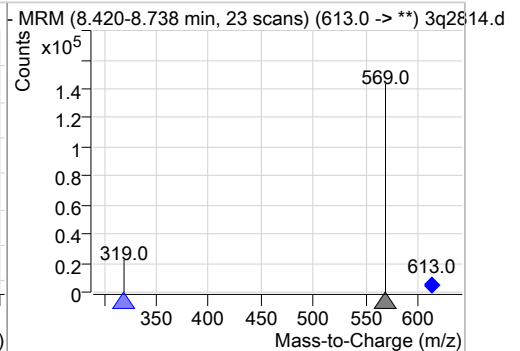
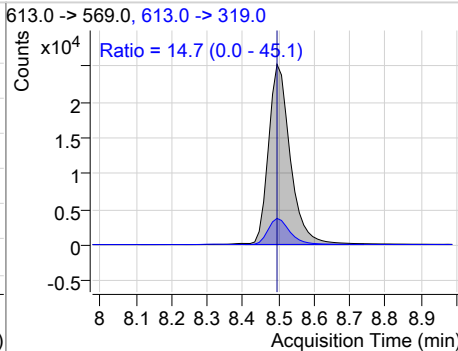
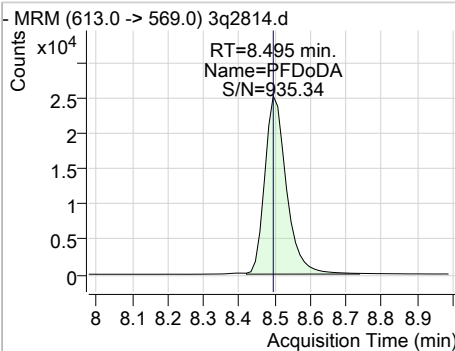
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	10.45	8.15	0.00	98958	563.0 -> 269.0	18.6	0.0	48.9



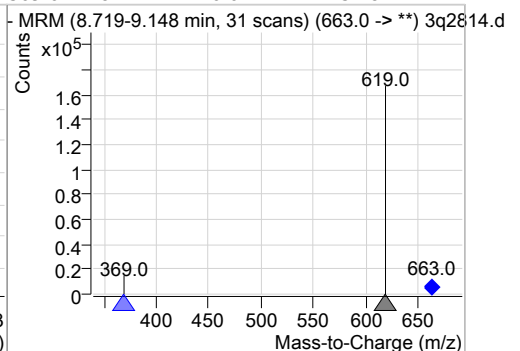
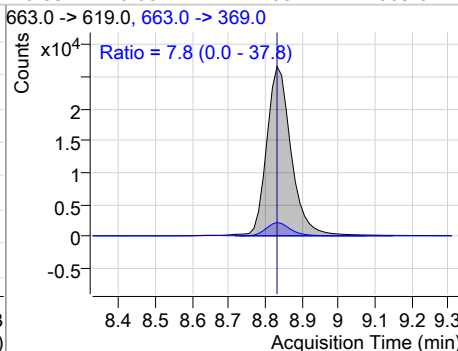
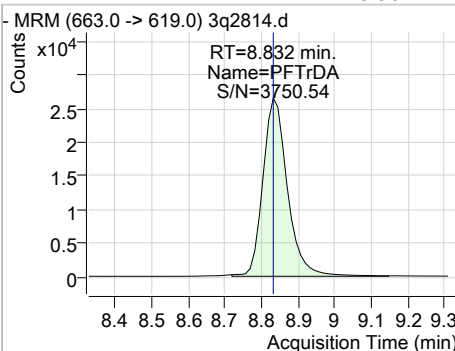
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	9.47	8.29	0.00	74051	631.0 -> 451.0	18.6	0.0	48.9



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	9.95	8.50	0.00	106426	613.0 -> 319.0	14.7	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	9.98	8.83	0.00	124064	663.0 -> 369.0	7.8	0.0	37.8

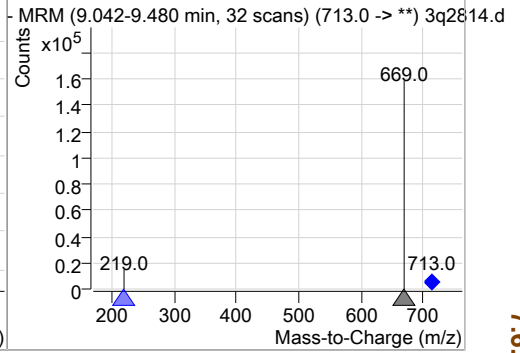
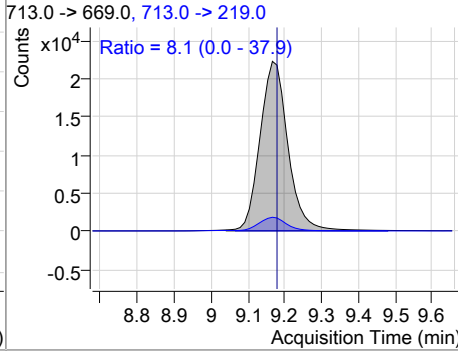
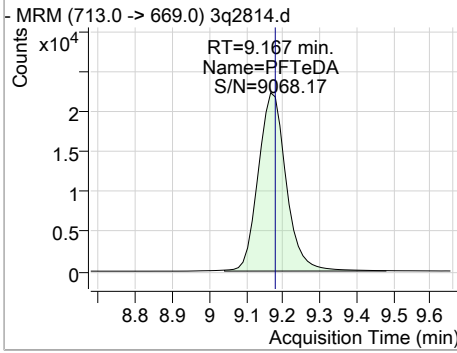


7.6.5
7



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	9.89	9.17	-0.01	117093	713.0 -> 219.0	8.1	0.0	37.9



7.6.5
7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2814.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 16:03 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.27	Split peak

7.6.5.1

7

Manual Integrations
APPROVED
(compounds with "m" flag)

Norman Farmer
04/12/19 17:21

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2815.d
Operator : nancyf
Acq. Method : 537_LIST_GENX.m
Acq. Date-Time : 4/11/2019 4:18:40 PM
Sample Name : icc72-20
Vial : P1-A7
DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
Batch Name : s3q72.batch.bin
Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Symmetry	Conc. Units	Dev(Min)
Internal Standards						
13C2-6:2FTS	6.662	429.0 -> 409.0	53942		20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	247659		20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	222289		20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	154215		20.00 µg/L	0.000
13C4-PFOS	7.252	503.0 -> 80.0	56871		20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	27780		20.00 µg/L	0.000
System Monitoring Compounds						
13C2-PFDA	7.759	515.0 -> 470.0	220319		19.72 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 98.6%	
13C2-PFHxA	5.024	315.0 -> 270.0	194031		19.17 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 95.8%	
d5-EtFOSAA	7.903	589.0 -> 419.0	28613		17.75 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%				Recovery = 88.8%	
13C3-HFPO-DA	5.316	287.0 -> 169.0	65915		96.60 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%				Recovery = 96.6%	
Target Compounds						
4:2FTS	4.921	327.0 -> 307.0	55251	1.17	18.92 µg/L	100
6:2FTS	6.663	427.0 -> 407.0	49504		19.12 µg/L	100
8:2FTS	7.784	527.0 -> 507.0	35121		19.83 µg/L	100
EtFOSAA	7.916	584.0 -> 419.0	24433		18.84 µg/L	100
FOSA	7.333	498.0 -> 78.0	87685		18.90 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	27351		18.17 µg/L	100
PFBA	1.726	213.0 -> 169.0	52973	1.27	17.63 µg/L	100
PFBS	3.928	299.0 -> 80.0	54476	1.29	18.05 µg/L	100
PFDA	7.759	513.0 -> 469.0	173439		20.14 µg/L	100
PFDoDA	8.495	613.0 -> 569.0	203552		18.77 µg/L	100
PFDS	8.117	599.0 -> 80.0	9391		19.02 µg/L	100
PFHpA	5.962	363.0 -> 319.0	274331		18.13 µg/L	100
PFHpS	6.684	449.0 -> 80.0	41434		18.63 µg/L	100
PFHxA	5.025	313.0 -> 269.0	95839	1.19	18.40 µg/L	100
PFHxS	6.007	399.0 -> 80.0	45085		18.37 µg/L	m 100
PFNA	7.272	463.0 -> 419.0	193936		19.17 µg/L	100
PFNS	7.730	549.0 -> 80.0	38251		19.57 µg/L	100
PFOA	6.681	413.0 -> 369.0	168161		18.73 µg/L	100
PFOS	7.253	499.0 -> 80.0	57327		18.38 µg/L	m 100
PFPeA	3.625	263.0 -> 219.0	185580	1.06	18.68 µg/L	100
PFPeS	5.155	349.0 -> 80.0	35182		19.09 µg/L	100
PFTeDA	9.179	713.0 -> 669.0	219902		18.31 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	236194		18.73 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	186268		19.39 µg/L	100
ADONA	6.061	377.0 -> 251.0	361540		18.11 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	34290		17.89 µg/L	100
11Cl-PF3OUds	8.290	631.0 -> 451.0	144680		18.30 µg/L	100
HFPO-DA	5.321	329.0 -> 169.0	224229		97.10 µg/L	100

7.6.6

7

Perfluorinated Compounds by LC/MS/MS

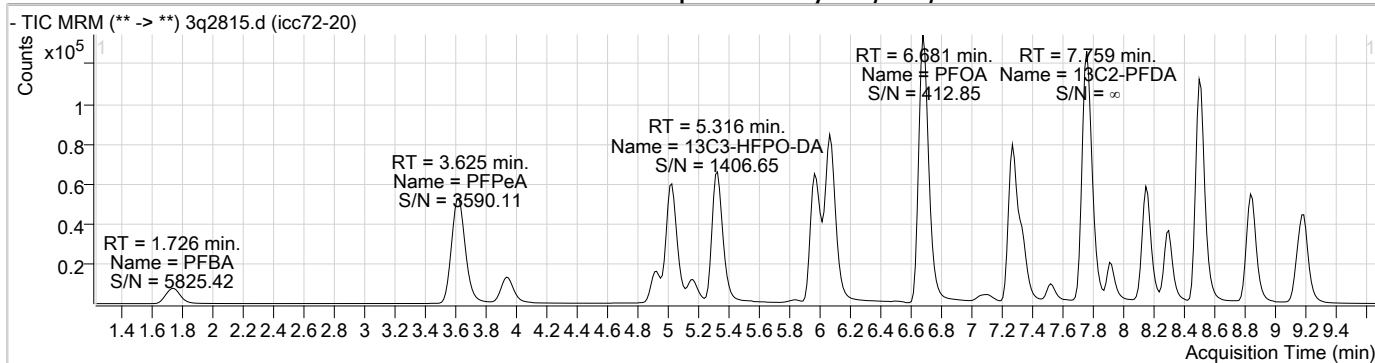
Compound	RT	QIon	Resp.	Symmetry	Conc. Units	Dev(Min)
----------	----	------	-------	----------	-------------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

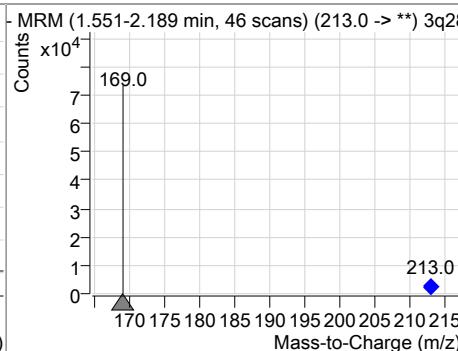
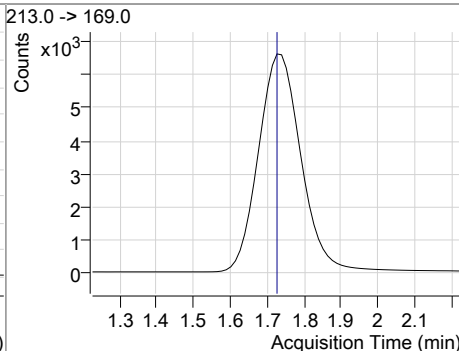
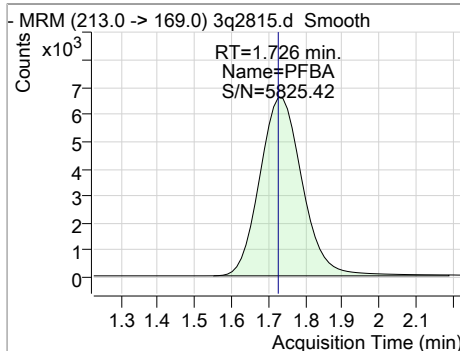
7.6.6

7

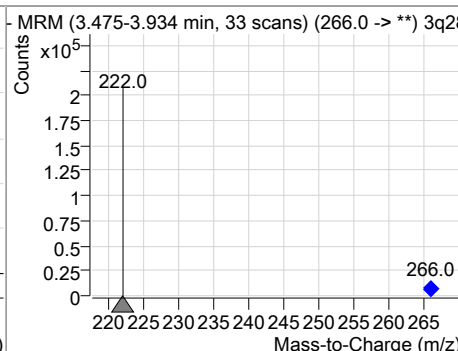
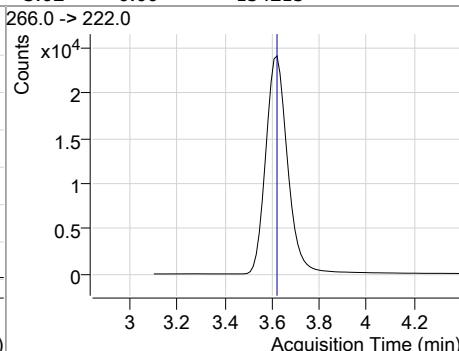
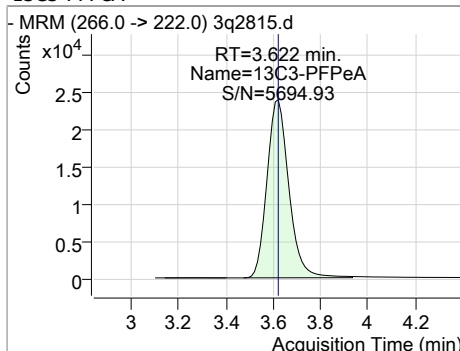
Perfluorinated Compounds by LC/MS/MS



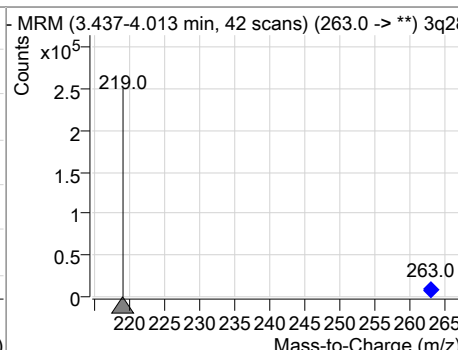
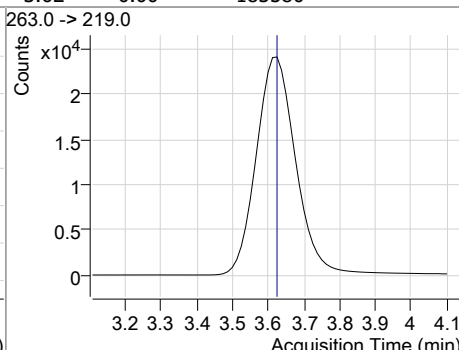
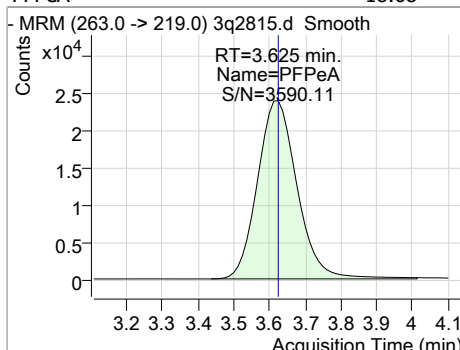
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	17.63	1.73	0.00	52973				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-PFPeA		3.62	0.00	154215				

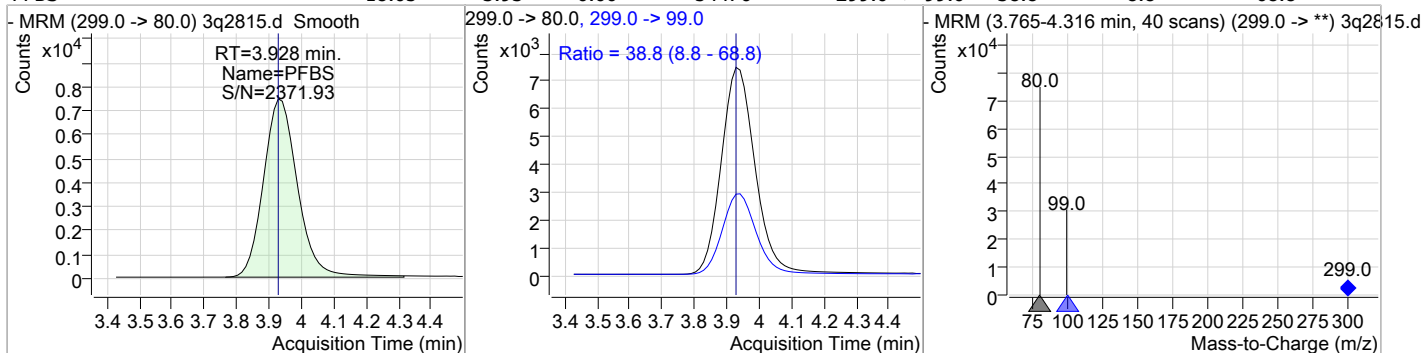


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	18.68	3.62	0.00	185580				

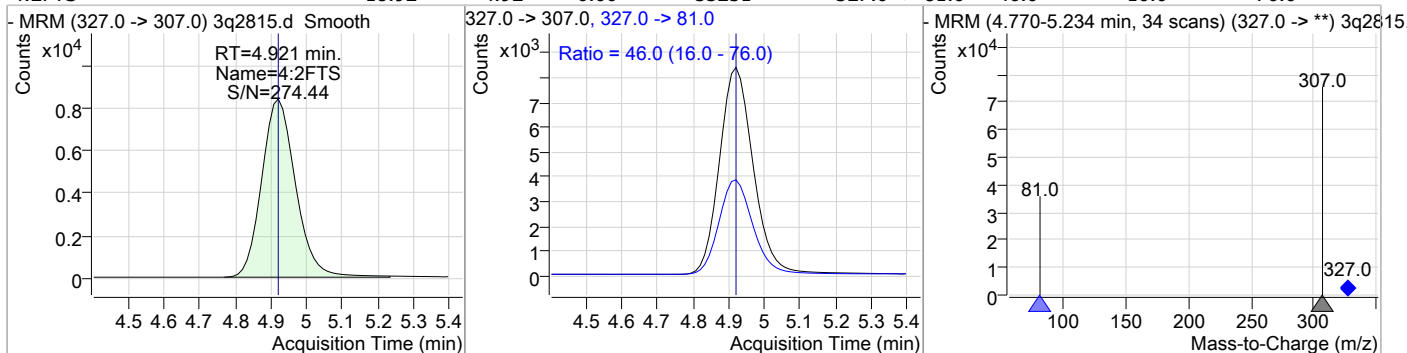


Perfluorinated Compounds by LC/MS/MS

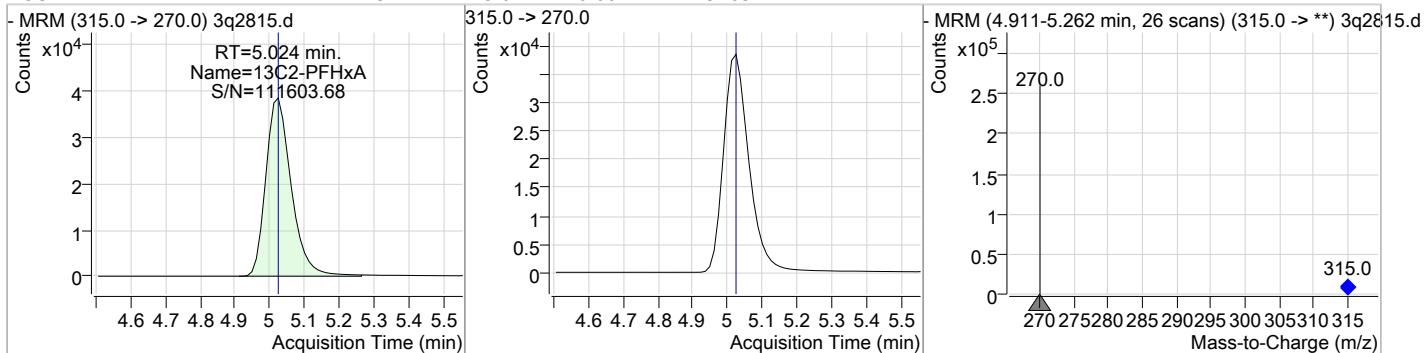
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	18.05	3.93	0.00	54476	299.0 -> 99.0	38.8	8.8	68.8



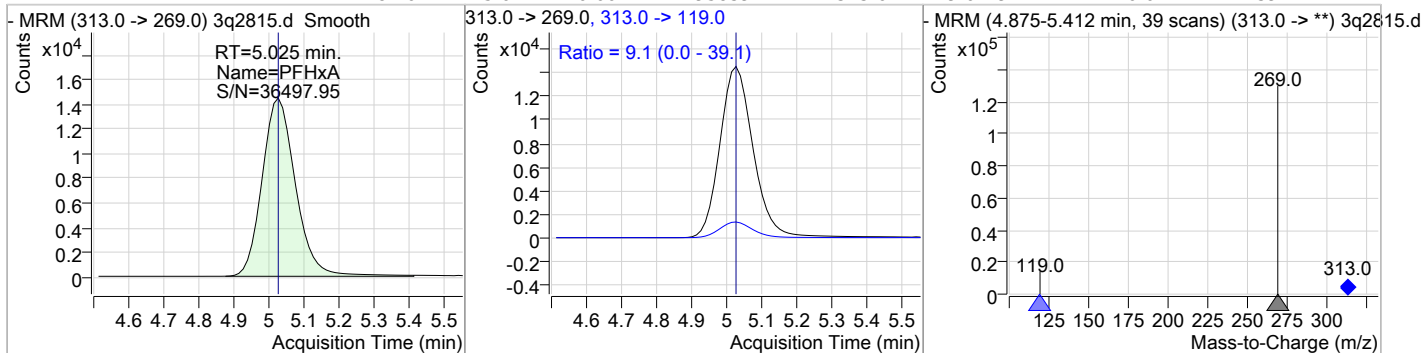
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	18.92	4.92	0.00	55251	327.0 -> 81.0	46.0	16.0	76.0



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	19.17	5.02	0.00	194031	315.0 -> 270.0			

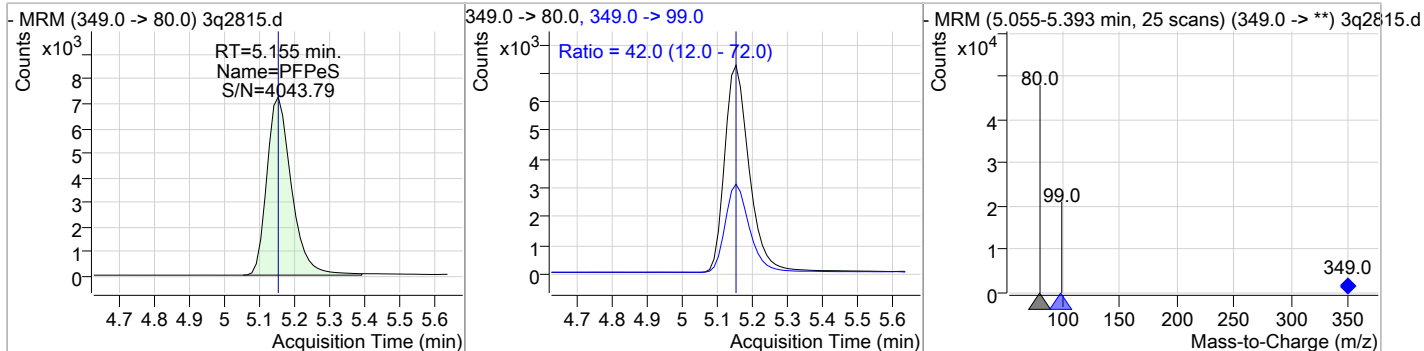


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.40	5.02	0.00	95839	313.0 -> 119.0	9.1	0.0	39.1

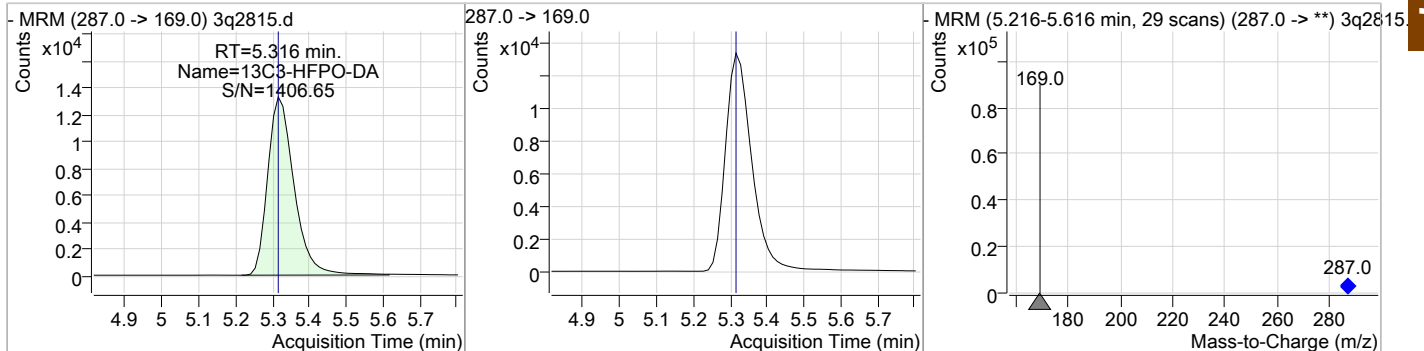


Perfluorinated Compounds by LC/MS/MS

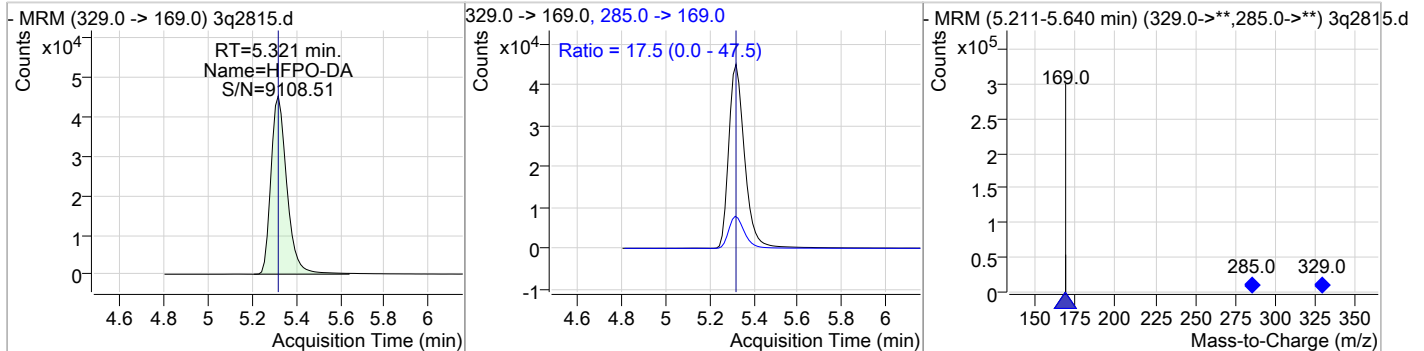
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.09	5.16	0.00	35182	349.0 -> 99.0	42.0	12.0	72.0



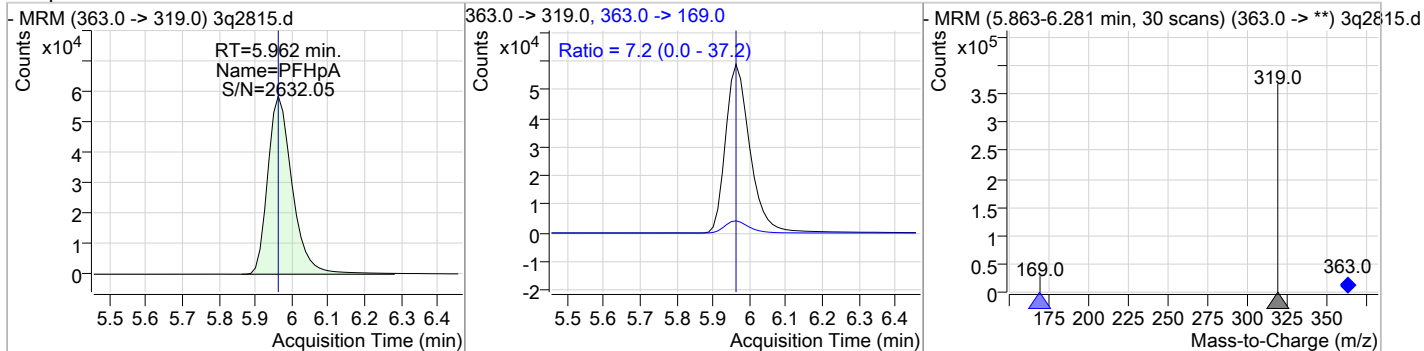
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	96.60	5.32	0.00	65915				



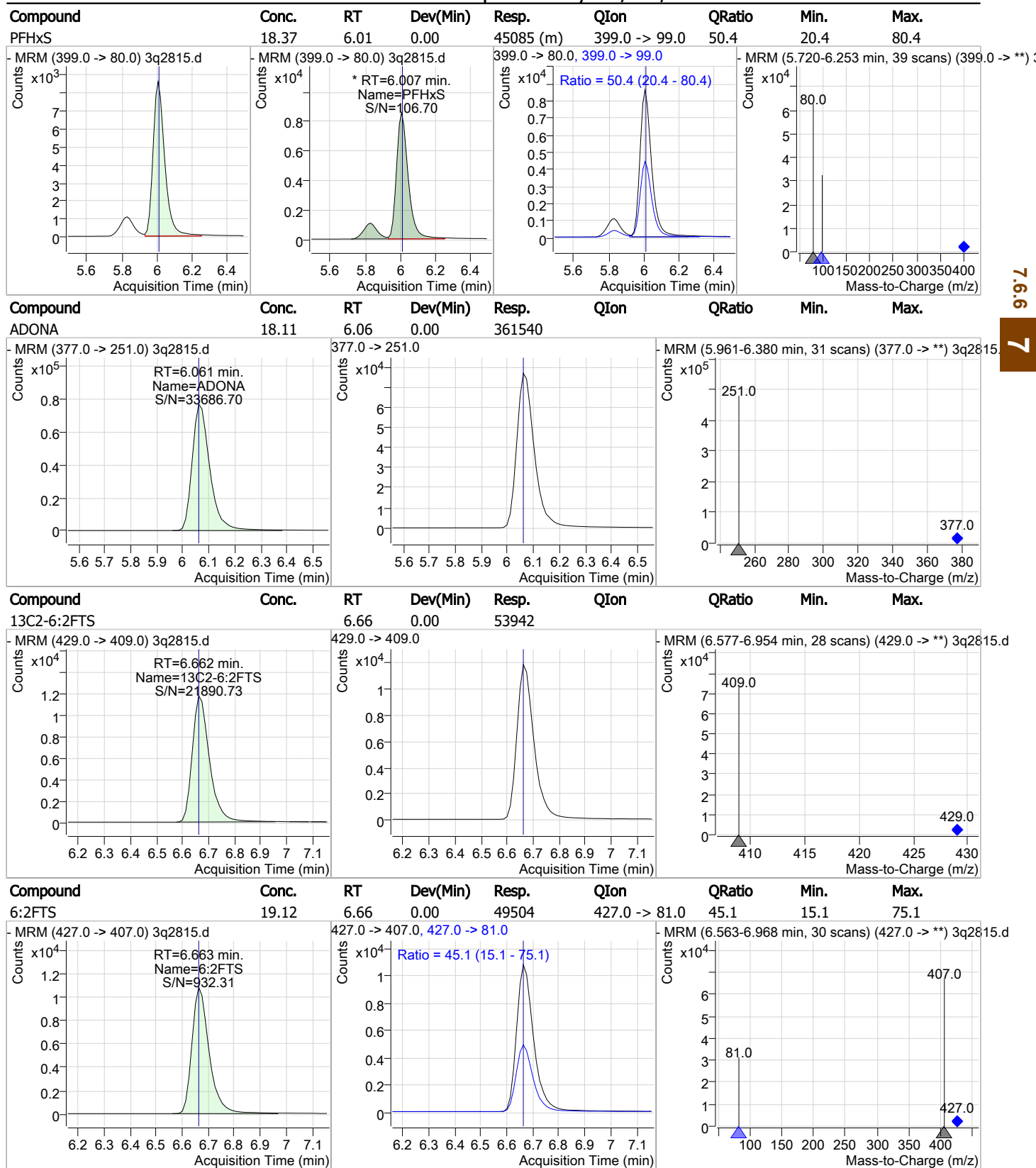
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	97.10	5.32	0.00	224229	285.0 -> 169.0	17.5	0.0	47.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	18.13	5.96	0.00	274331	363.0 -> 169.0	7.2	0.0	37.2



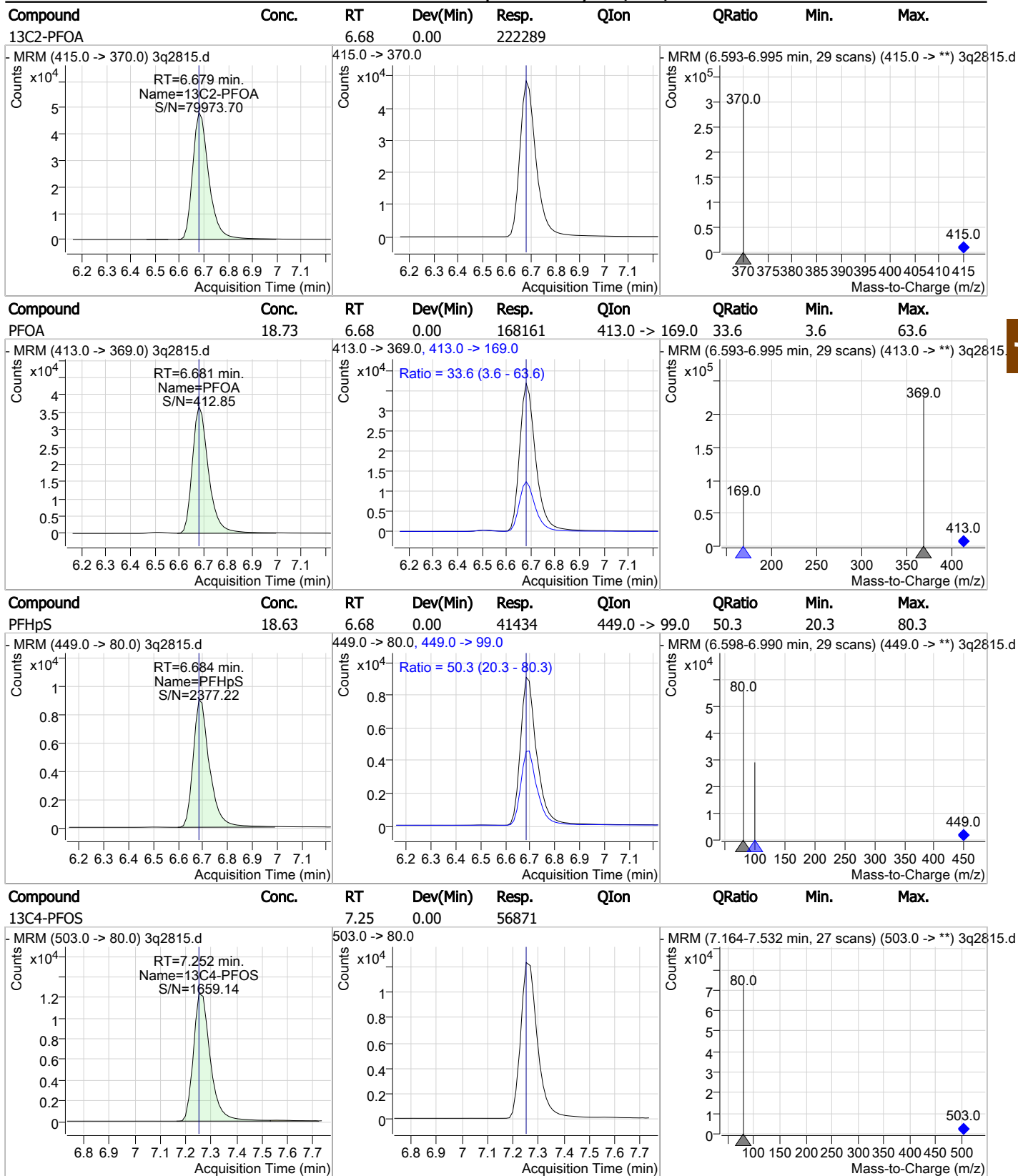
Perfluorinated Compounds by LC/MS/MS



7.6.6
7



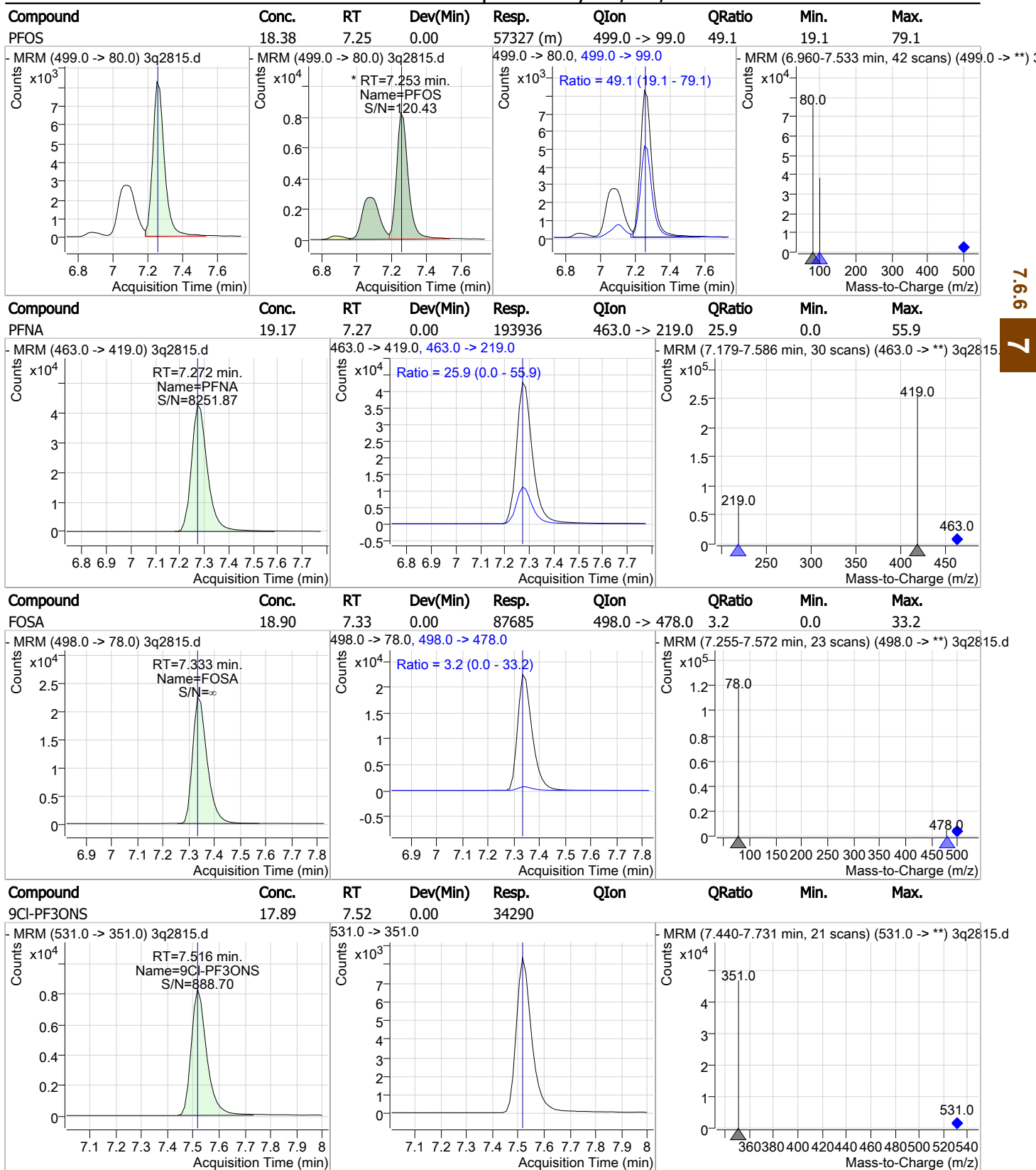
Perfluorinated Compounds by LC/MS/MS



7.6.6



Perfluorinated Compounds by LC/MS/MS

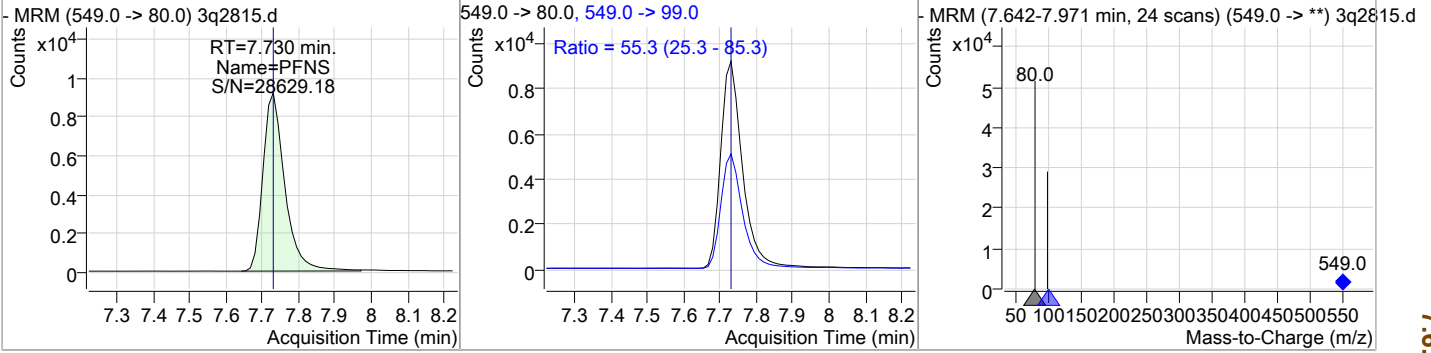


7.6.6
7

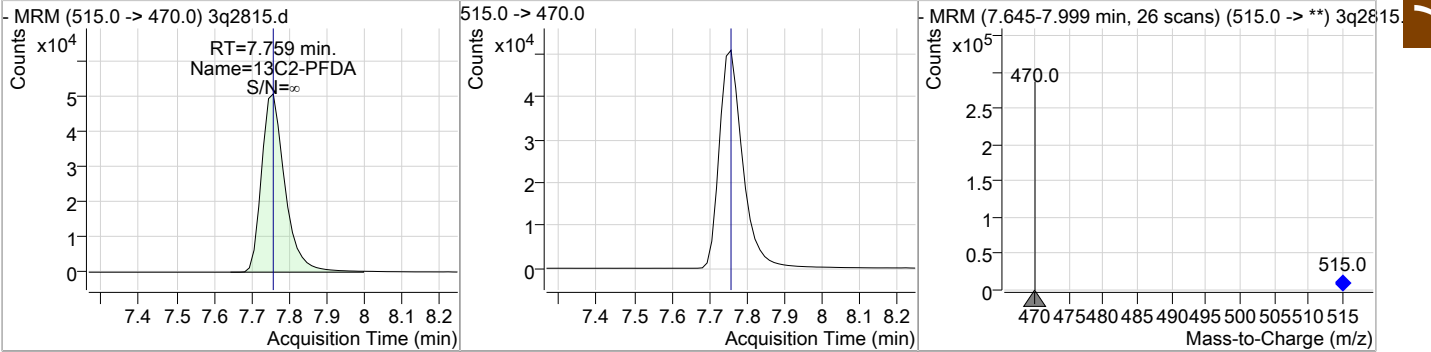


Perfluorinated Compounds by LC/MS/MS

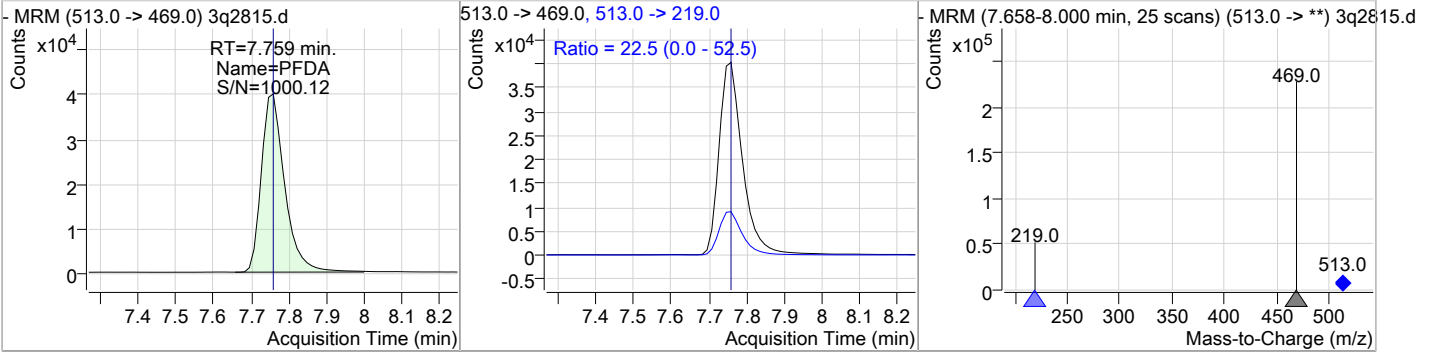
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	19.57	7.73	0.00	38251	549.0 -> 99.0	55.3	25.3	85.3



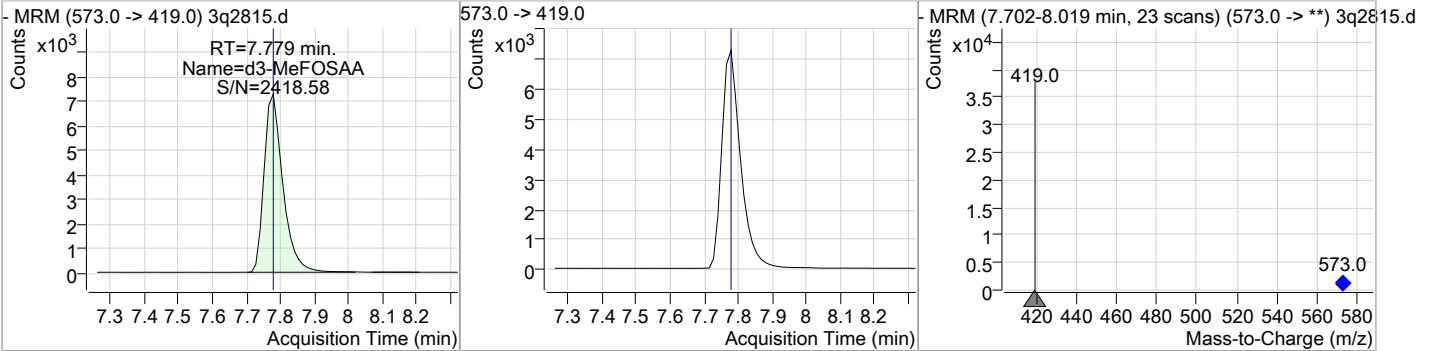
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	19.72	7.76	0.00	220319				



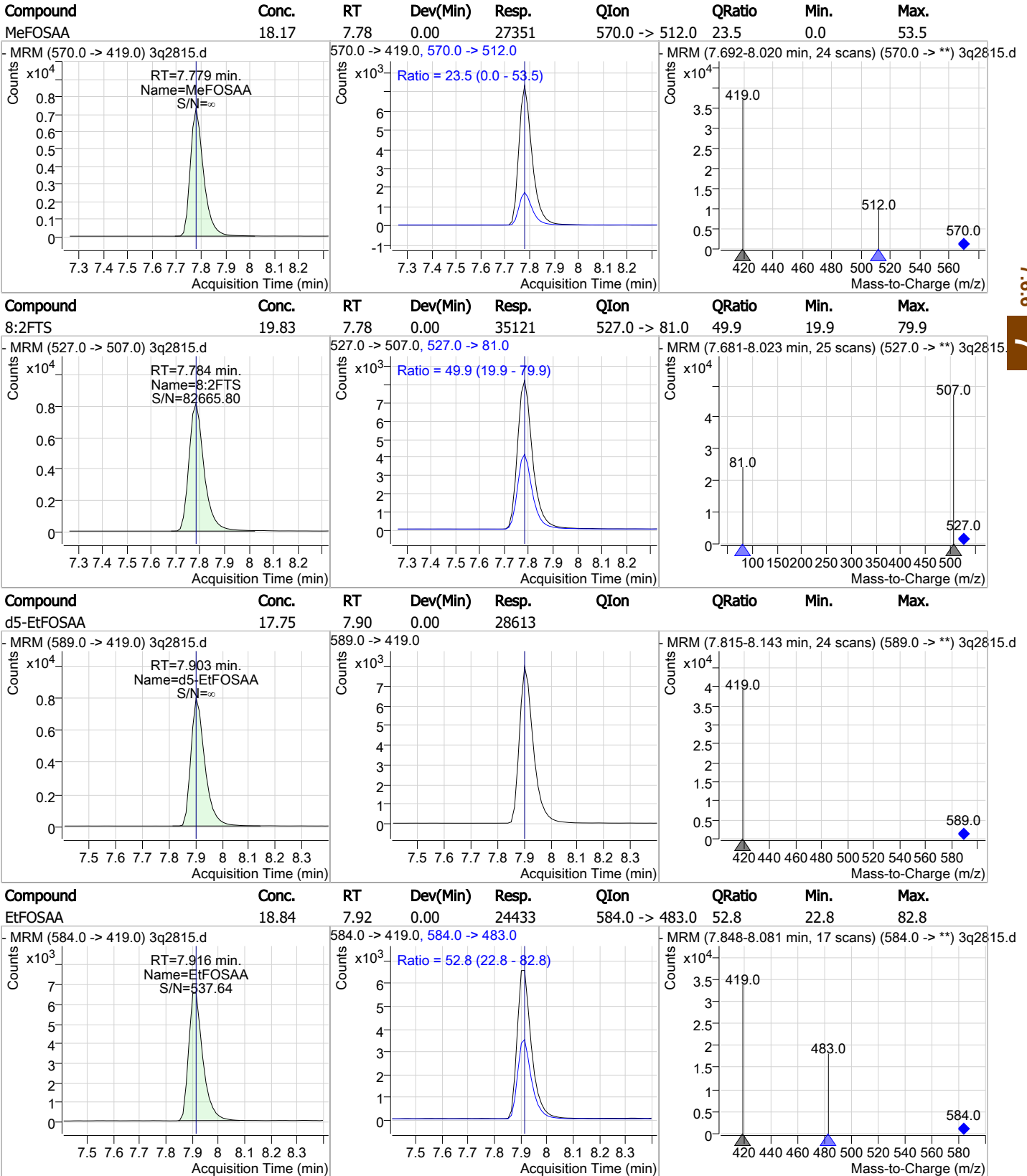
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.14	7.76	0.00	173439	513.0 -> 219.0	22.5	0.0	52.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d3-MeFOSAA		7.78	0.00	27780				



Perfluorinated Compounds by LC/MS/MS

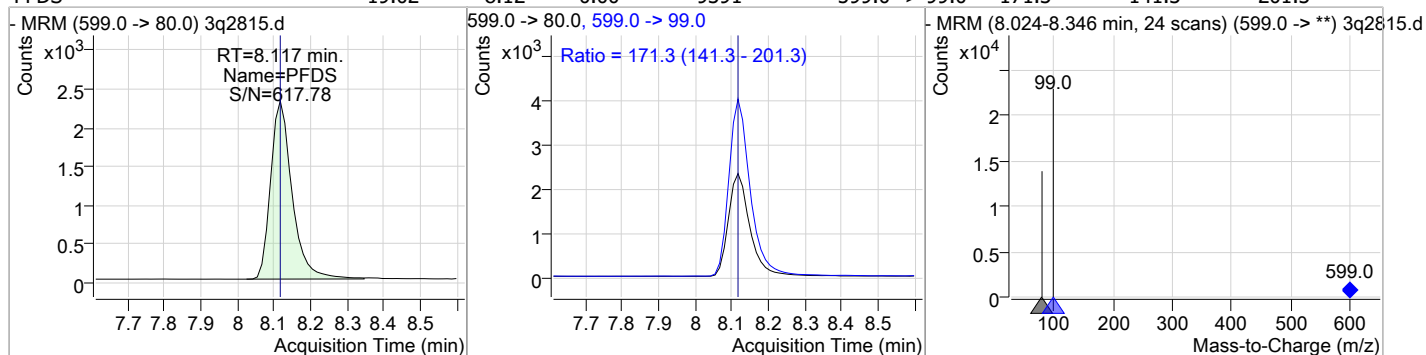


7.6.6
7

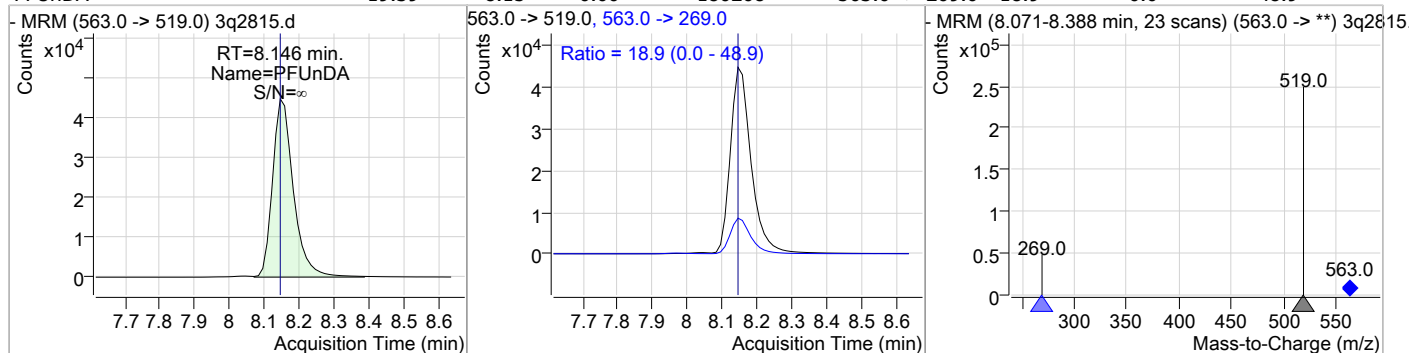


Perfluorinated Compounds by LC/MS/MS

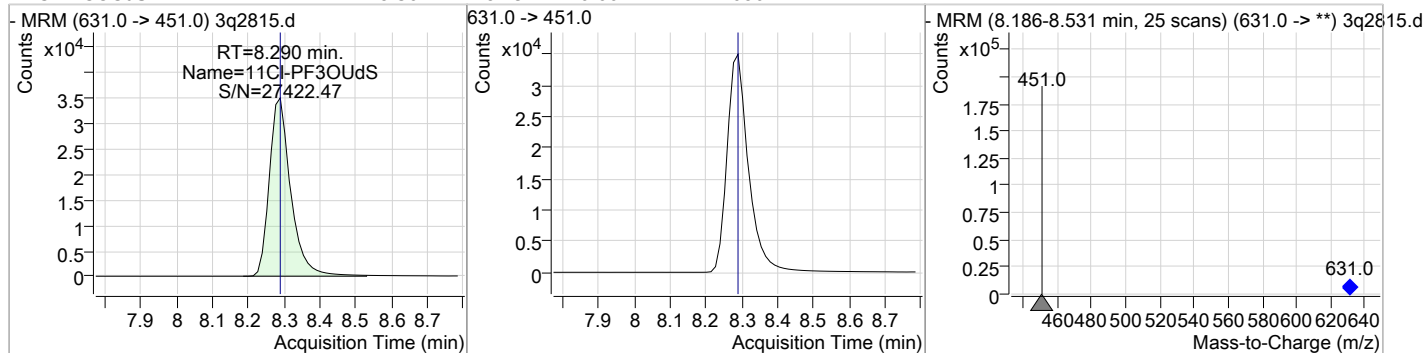
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	19.02	8.12	0.00	9391	599.0 -> 99.0	171.3	141.3	201.3



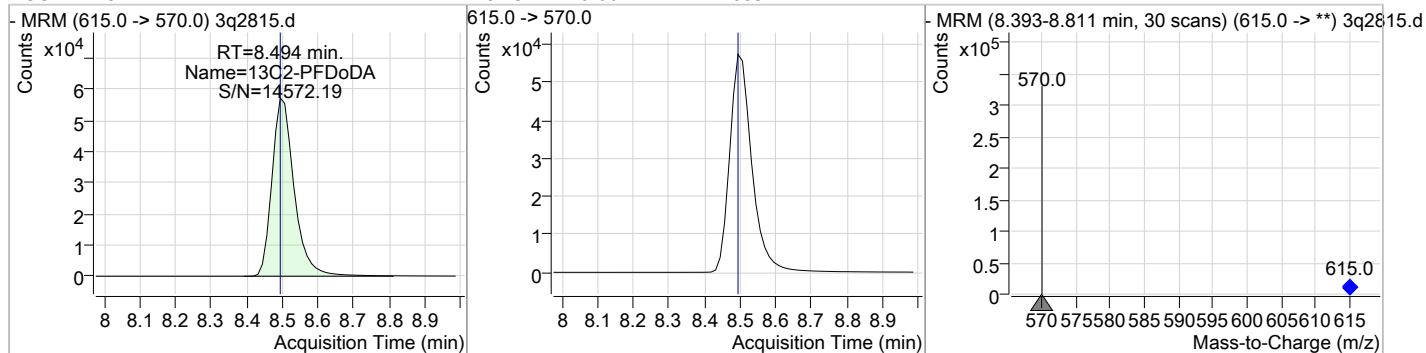
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	19.39	8.15	0.00	186268	563.0 -> 269.0	18.9	0.0	48.9



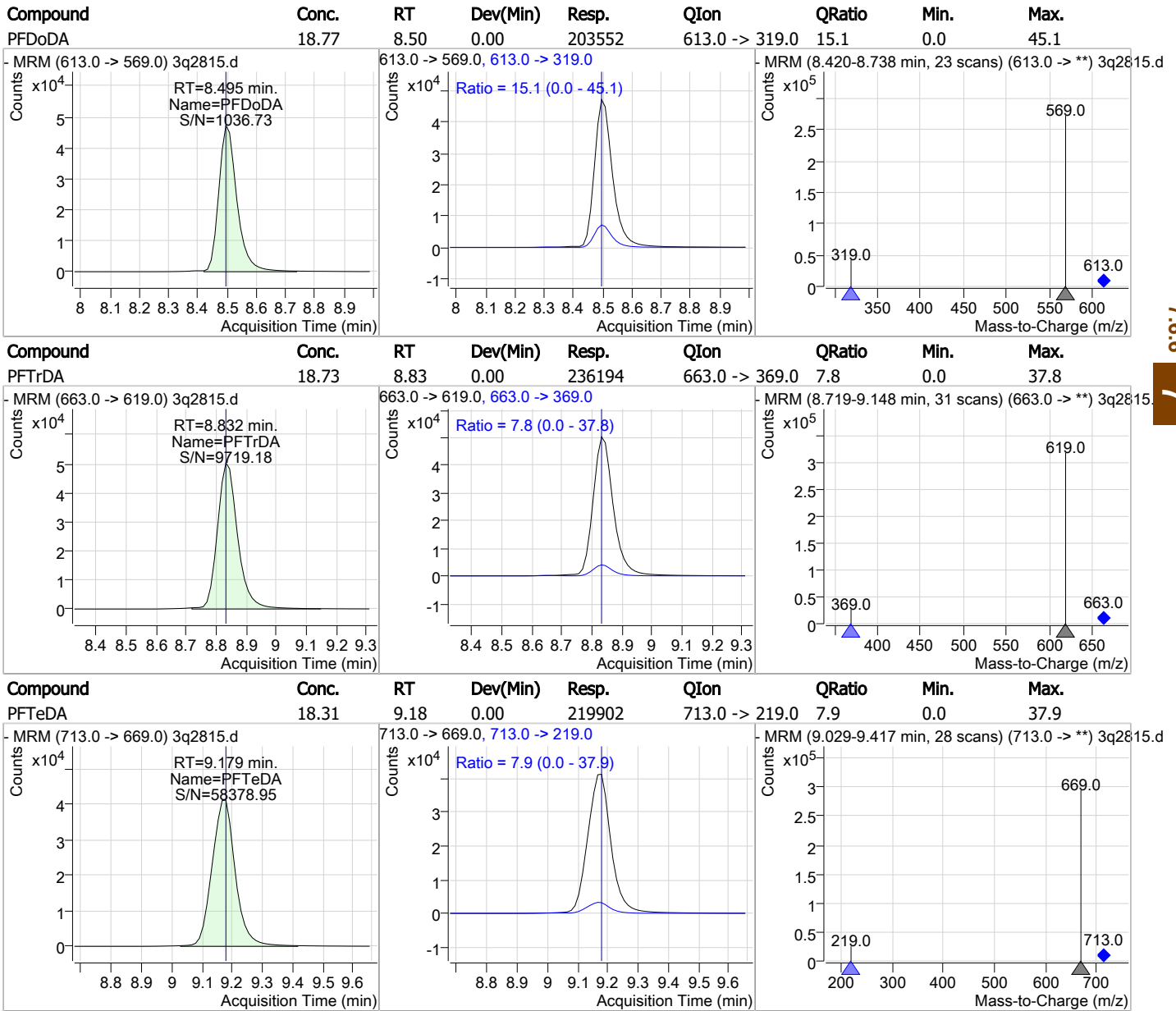
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	18.30	8.29	0.00	144680	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDoDA		8.49	0.00	247659	615.0 -> 570.0			



Perfluorinated Compounds by LC/MS/MS



7.6.6

7

Manual Integration Approval Summary

Sample Number: S3Q72-ICC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2815.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 16:18 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.6.1

7

Manual Integrations
APPROVED
(compounds with "m" flag)

Norman Farmer
04/12/19 17:21

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2816.d
Operator : nancyf
Acq. Method : 537_LIST_GENX.m
Acq. Date-Time : 4/11/2019 4:34:02 PM
Sample Name : ic72-50
Vial : P1-A8
DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
Batch Name : s3q72.batch.bin
Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	56606	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	245234	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	216158	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	153402	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	56144	20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	25573	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	535798	49.94 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 249.7%	
13C2-PFHxA	5.011	315.0 -> 270.0	508567	50.48 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 252.4%	
d5-EtFOSAA	7.903	589.0 -> 419.0	72288	48.72 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 243.6%	
13C3-HFPO-DA	5.303	287.0 -> 169.0	163146	251.39 µg/L	-0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 251.4%	
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	147978	48.28 µg/L	QValue
6:2FTS	6.663	427.0 -> 407.0	128205	47.19 µg/L	100
8:2FTS	7.770	527.0 -> 507.0	86340	46.46 µg/L	98
EtFOSAA	7.903	584.0 -> 419.0	62773	50.78 µg/L	97
FOSA	7.333	498.0 -> 78.0	219542	50.64 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	67165	48.48 µg/L	99
PFBA	1.726	213.0 -> 169.0	140629	48.13 µg/L	100
PFBS	3.916	299.0 -> 80.0	144481	48.50 µg/L	99
PFDA	7.747	513.0 -> 469.0	422656	50.47 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	535632	49.87 µg/L	100
PFDS	8.117	599.0 -> 80.0	24662	50.58 µg/L	97
PFHpA	5.962	363.0 -> 319.0	715737	48.64 µg/L	99
PFHpS	6.684	449.0 -> 80.0	108776	49.54 µg/L	100
PFHxA	5.012	313.0 -> 269.0	247019	48.77 µg/L	99
PFHxS	5.995	399.0 -> 80.0	118587	48.94 µg/L	m 100
PFNA	7.272	463.0 -> 419.0	487783	49.58 µg/L	99
PFNS	7.717	549.0 -> 80.0	97231	50.40 µg/L	98
PFOA	6.681	413.0 -> 369.0	434648	49.80 µg/L	100
PFOS	7.253	499.0 -> 80.0	153102	49.73 µg/L	m 98
PFPeA	3.612	263.0 -> 219.0	493185	49.91 µg/L	100
PFPeS	5.143	349.0 -> 80.0	92740	50.58 µg/L	100
PFTeDA	9.167	713.0 -> 669.0	608924	51.21 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	630910	50.52 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	474235	49.86 µg/L	99
ADONA	6.061	377.0 -> 251.0	946167	48.73 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	91579	49.12 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	378506	49.24 µg/L	100
HFPO-DA	5.308	329.0 -> 169.0	551123	251.05 µg/L	100

Perfluorinated Compounds by LC/MS/MS

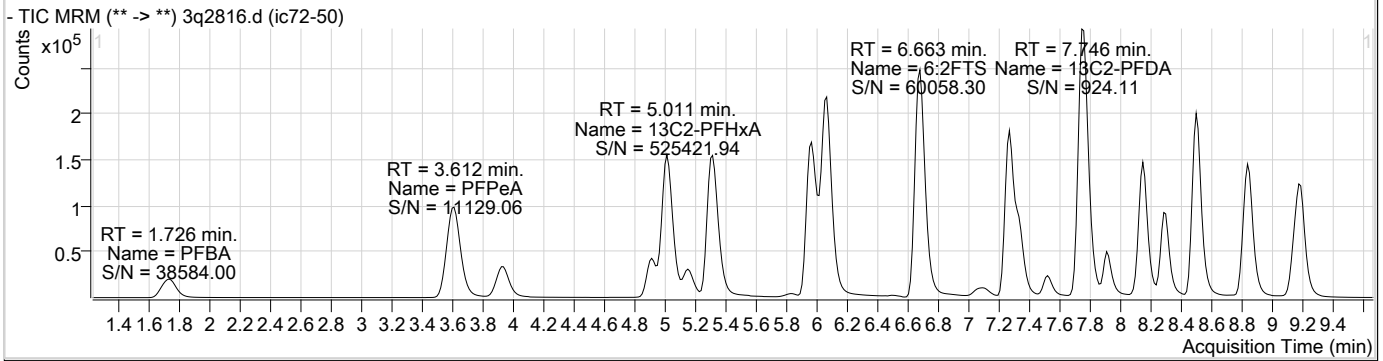
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

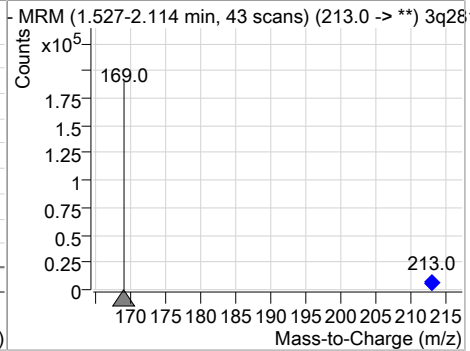
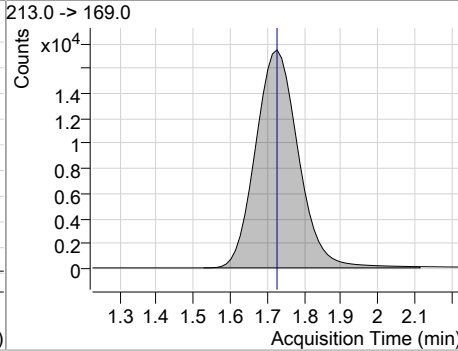
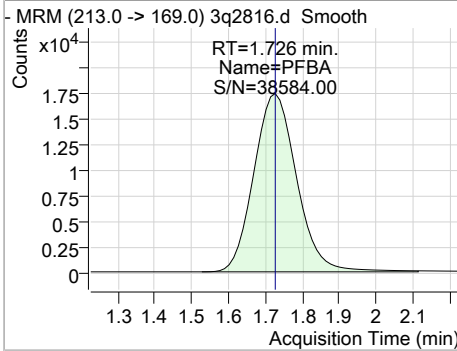
7.6.7

7

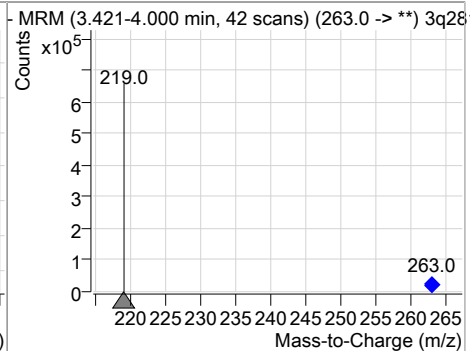
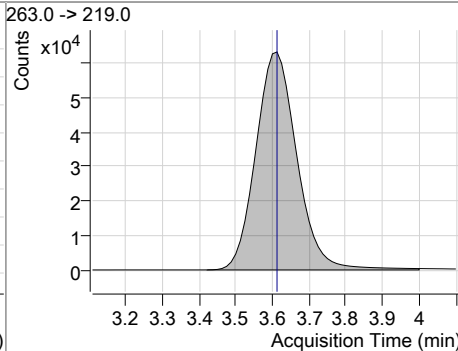
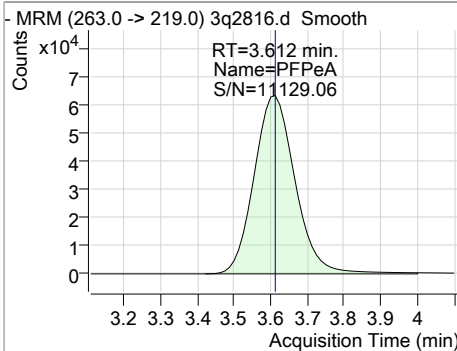
Perfluorinated Compounds by LC/MS/MS



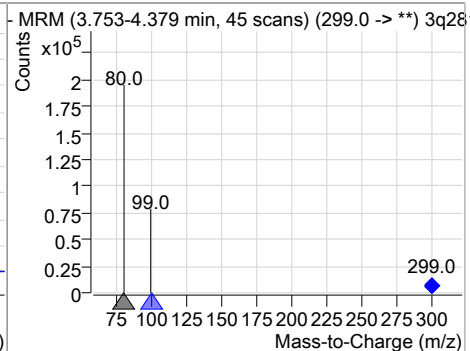
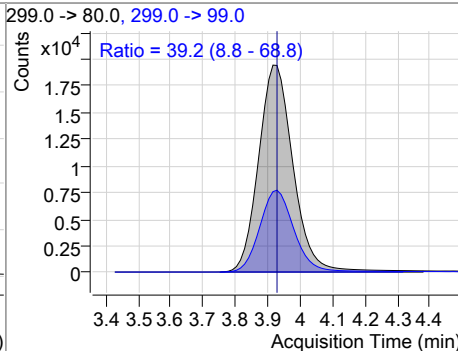
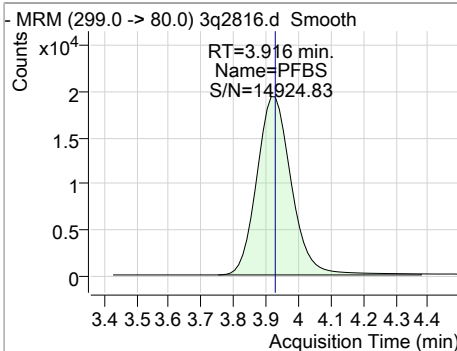
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	48.13	1.73	0.00	140629				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	49.91	3.61	-0.01	493185				

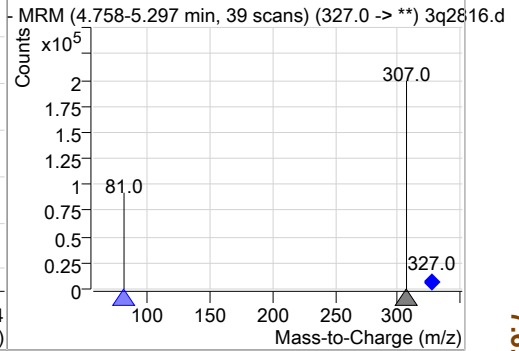
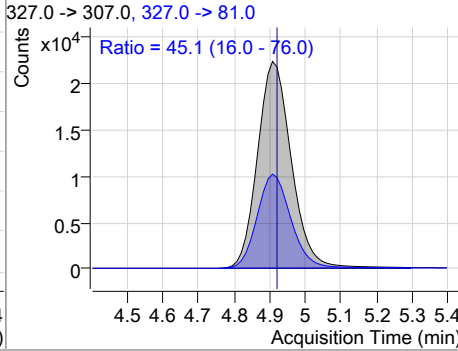
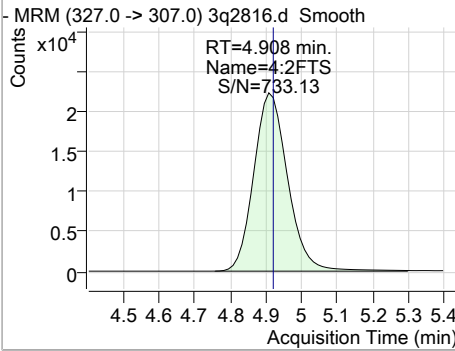


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	48.50	3.92	-0.01	144481	299.0 -> 99.0	39.2	8.8	68.8

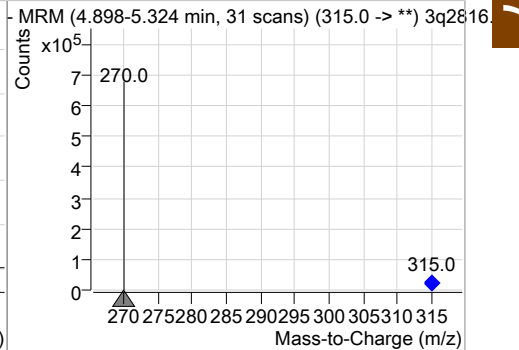
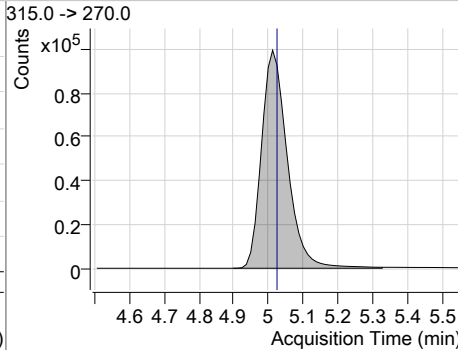
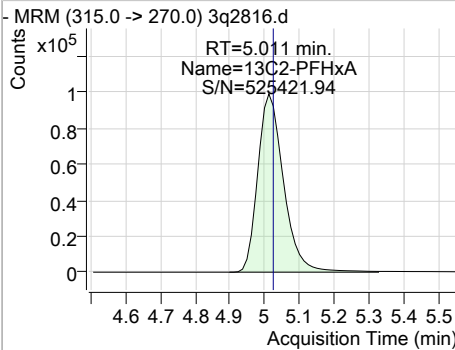


Perfluorinated Compounds by LC/MS/MS

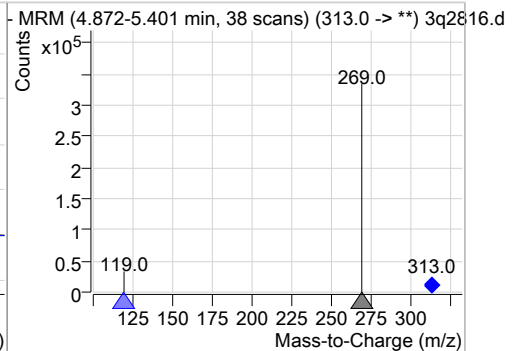
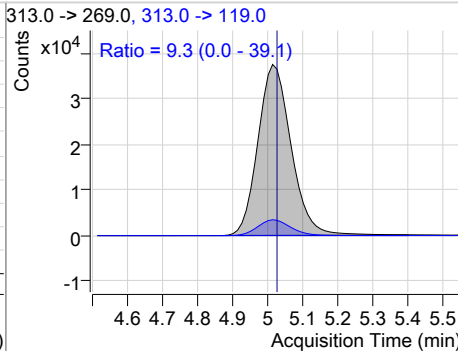
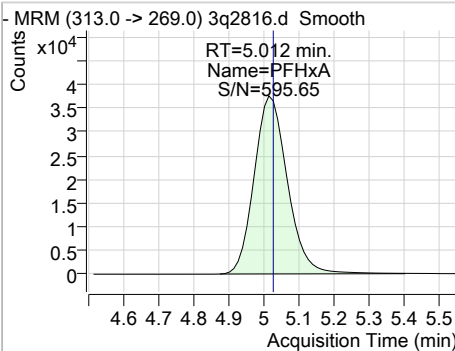
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	48.28	4.91	-0.01	147978	327.0 -> 81.0	45.1	16.0	76.0



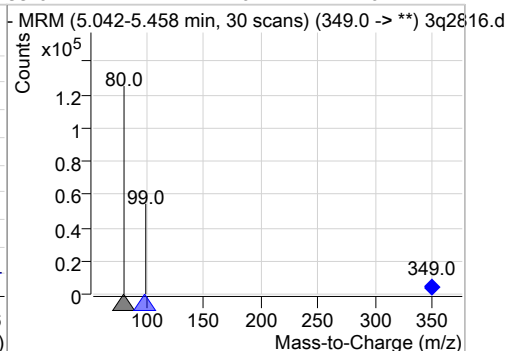
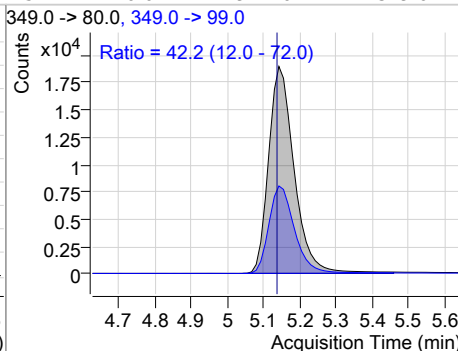
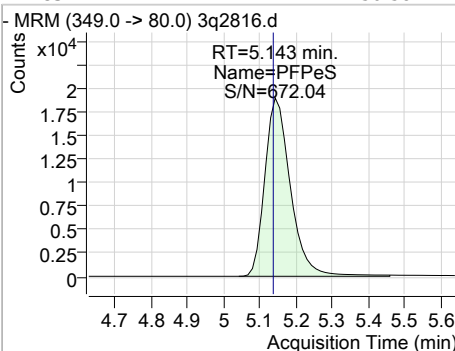
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	50.48	5.01	-0.01	508567				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	48.77	5.01	-0.01	247019	313.0 -> 119.0	9.3	0.0	39.1

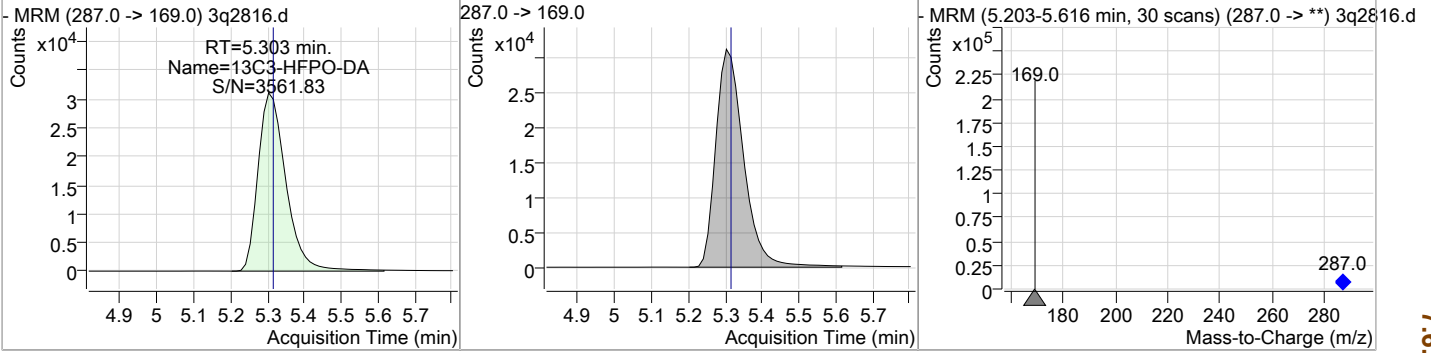


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	50.58	5.14	-0.01	92740	349.0 -> 99.0	42.2	12.0	72.0

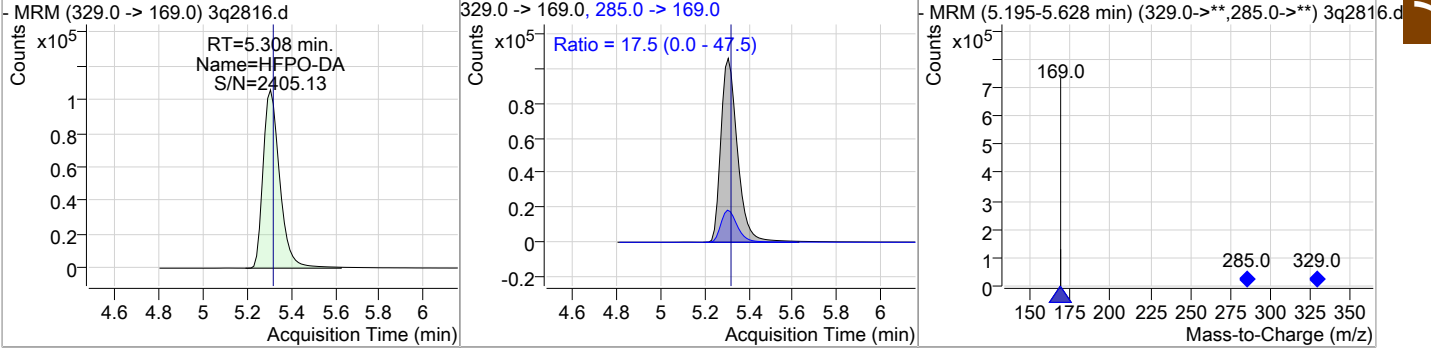


Perfluorinated Compounds by LC/MS/MS

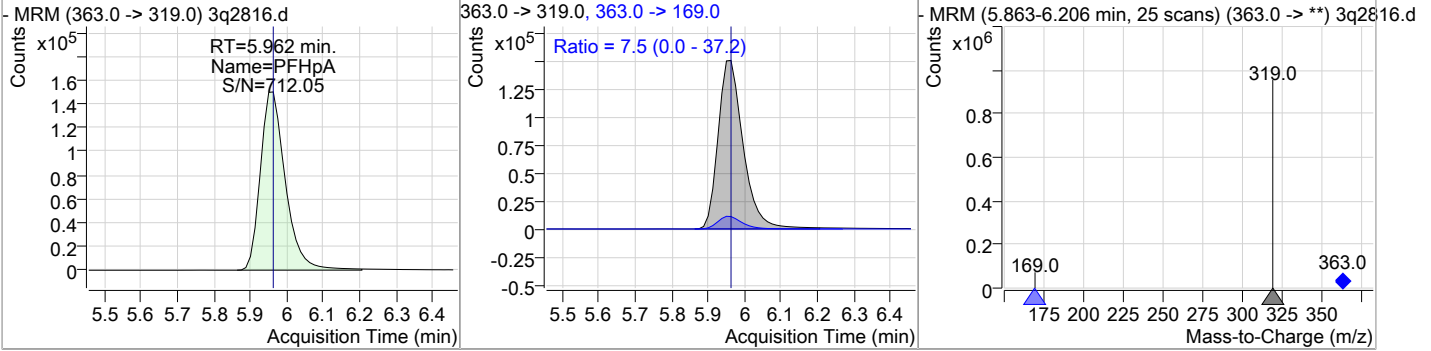
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	251.39	5.30	-0.01	163146				



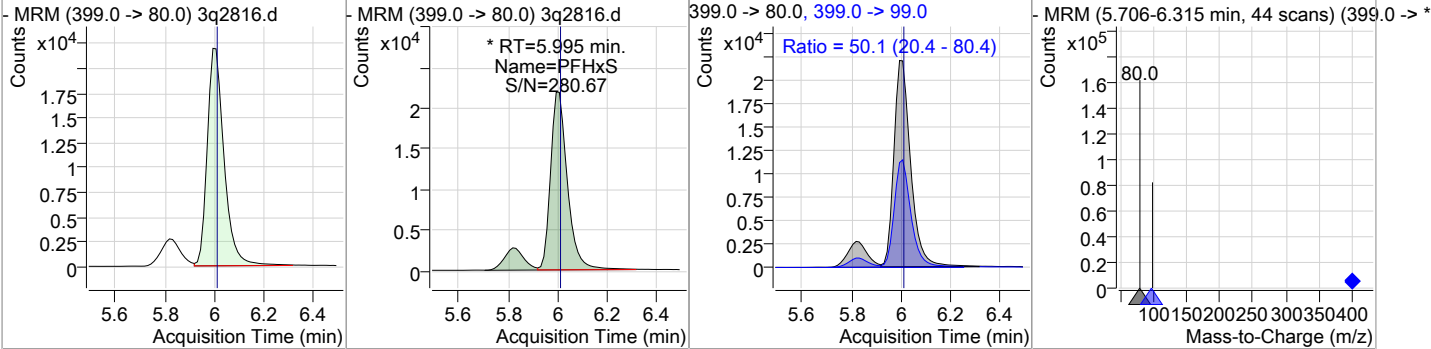
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	251.05	5.31	-0.01	551123	285.0 -> 169.0	17.5	0.0	47.5



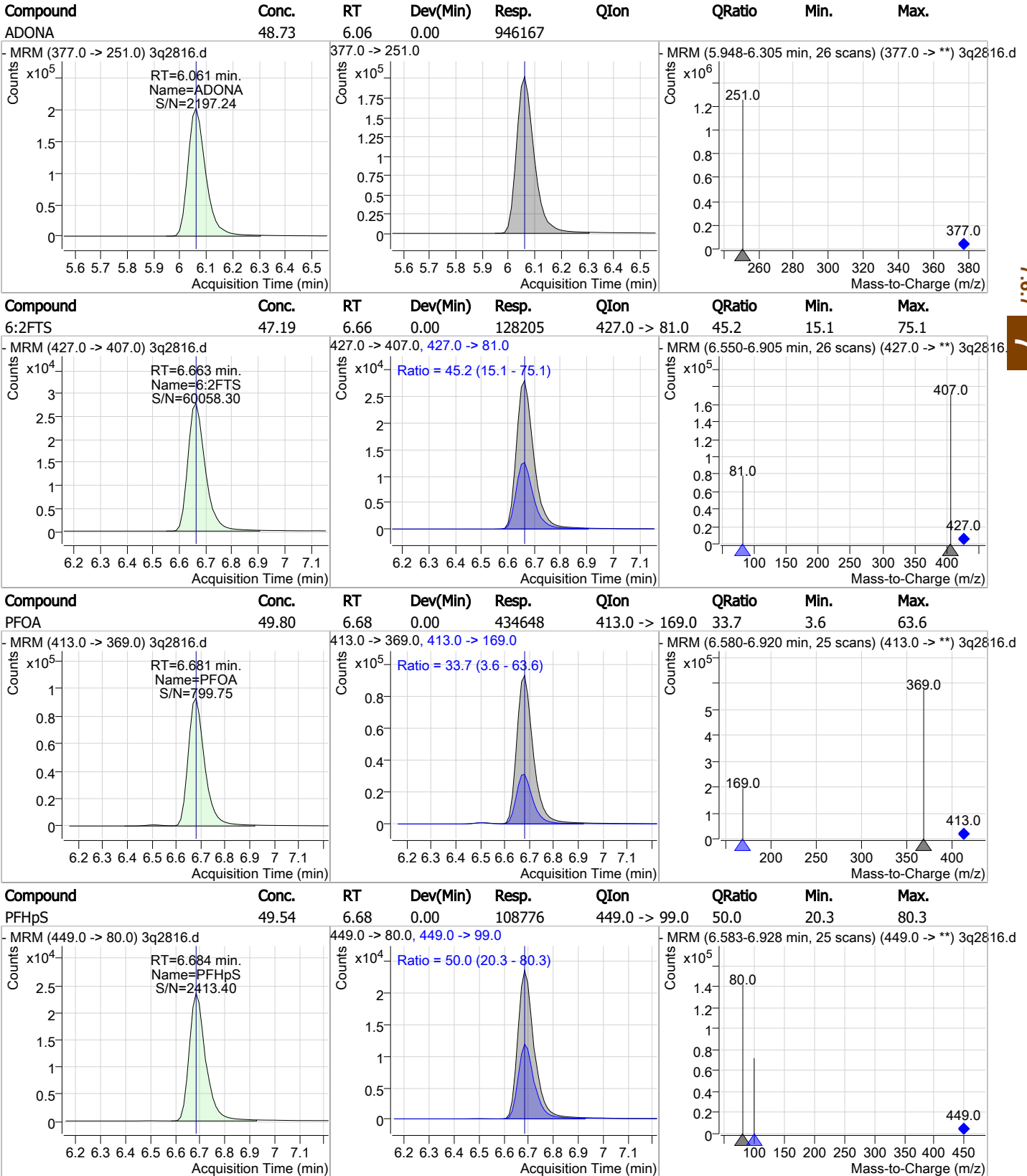
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	48.64	5.96	0.00	715737	363.0 -> 169.0	7.5	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	48.94	5.99	-0.01	118587 (m)	399.0 -> 99.0	50.1	20.4	80.4



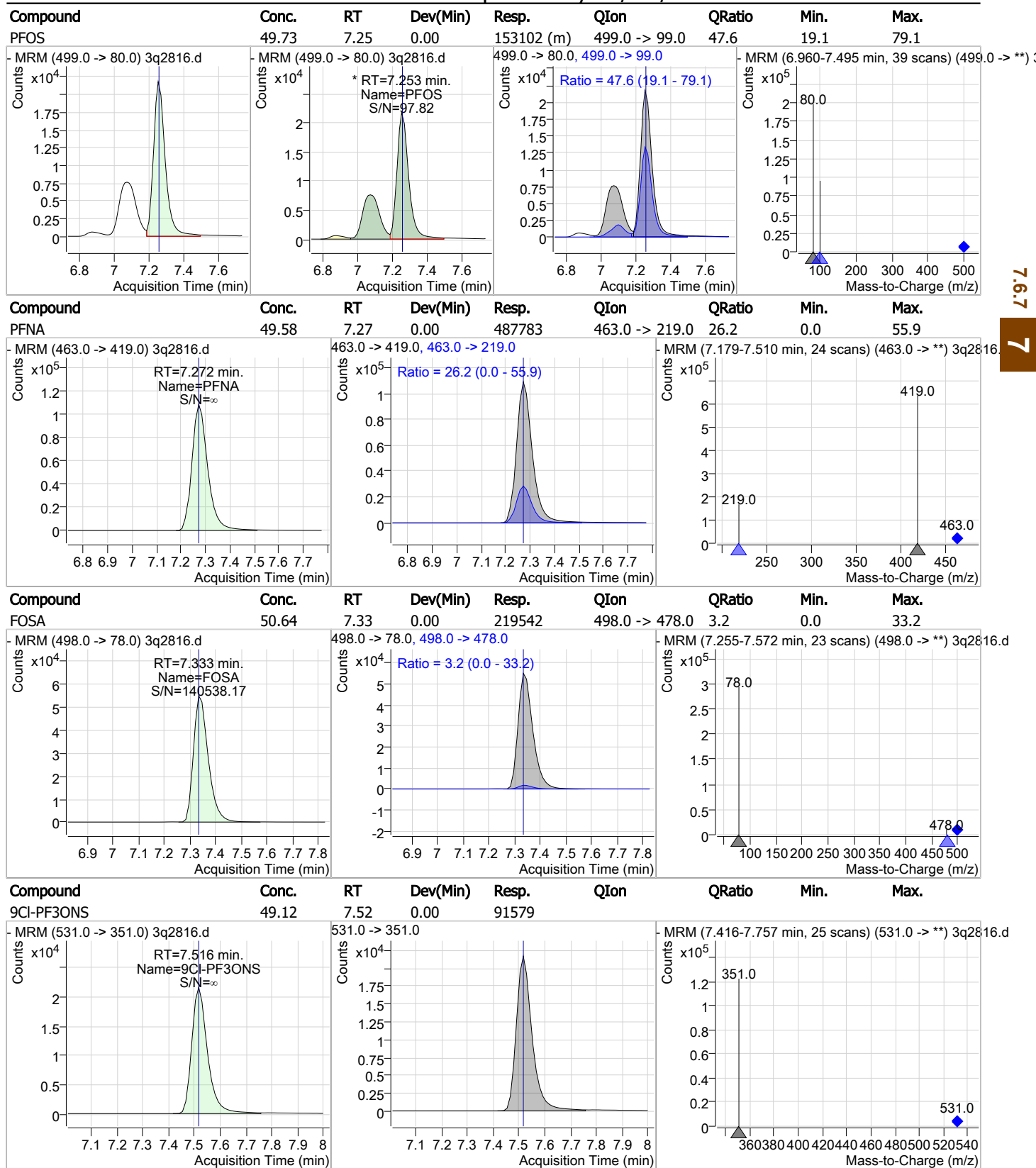
Perfluorinated Compounds by LC/MS/MS



7.6.7

7

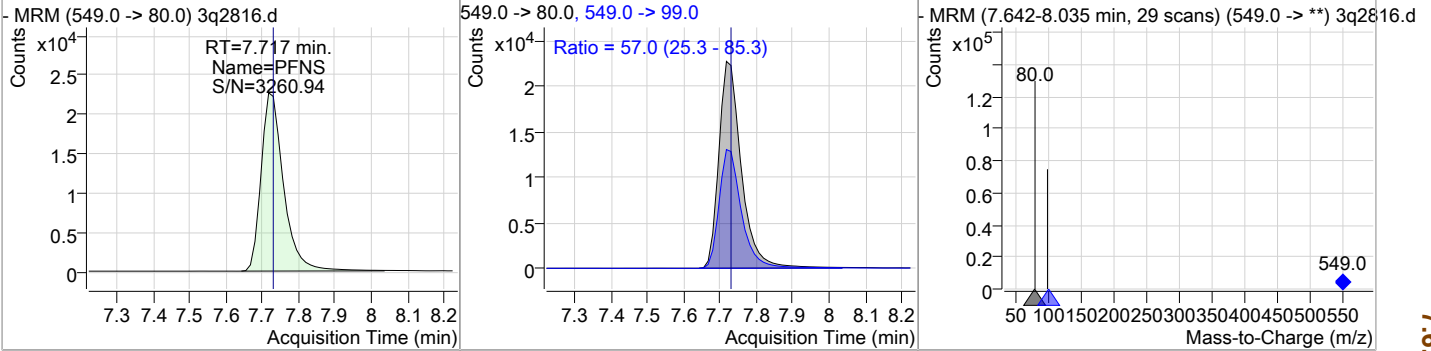
Perfluorinated Compounds by LC/MS/MS



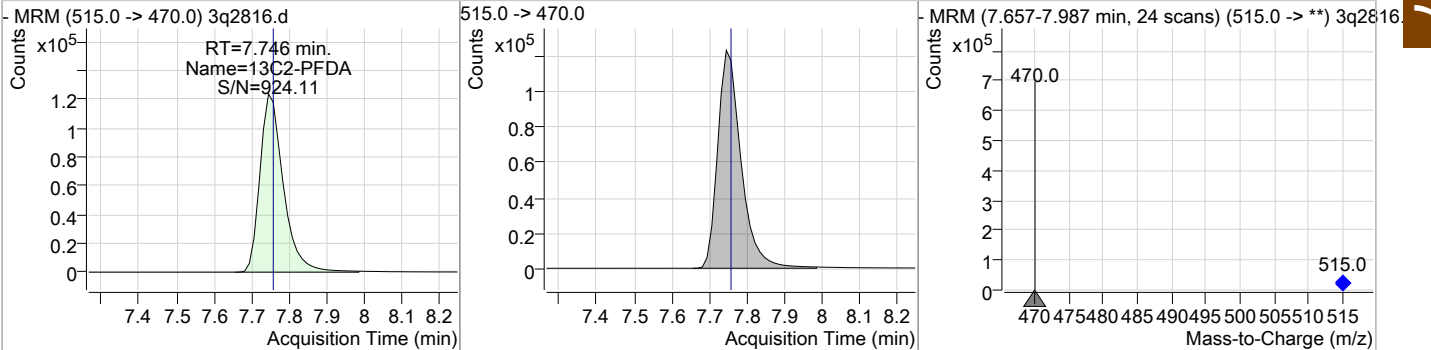
7.6.7
7

Perfluorinated Compounds by LC/MS/MS

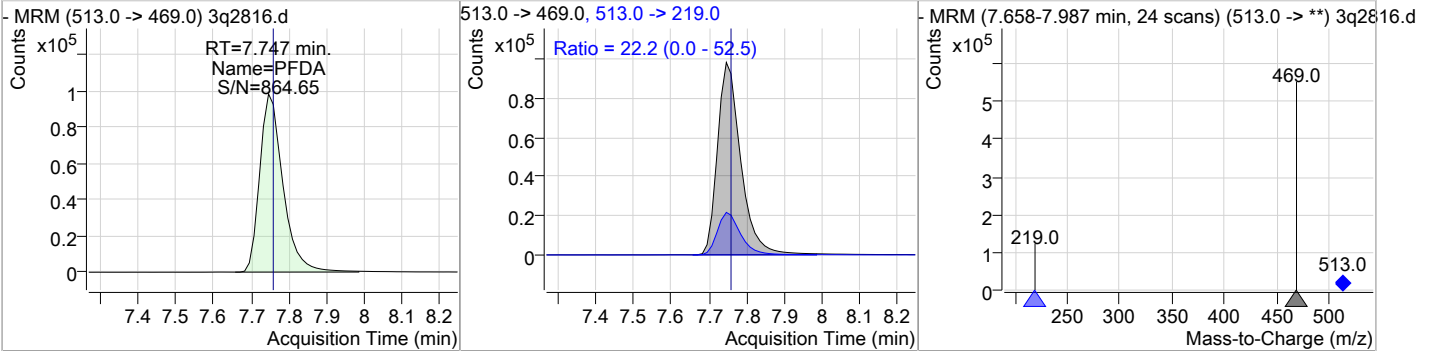
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	50.40	7.72	-0.01	97231	549.0 -> 99.0	57.0	25.3	85.3



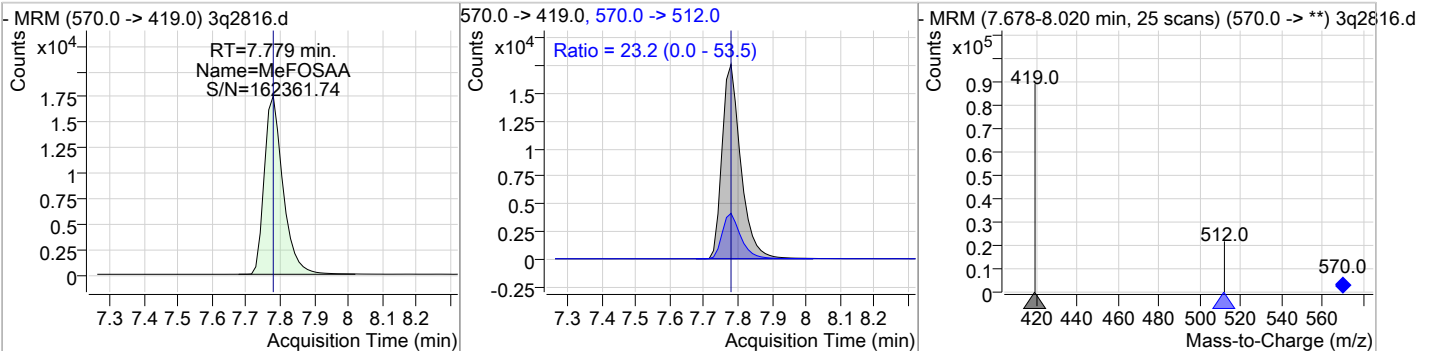
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	49.94	7.75	-0.01	535798				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	50.47	7.75	-0.01	422656	513.0 -> 219.0	22.2	0.0	52.5

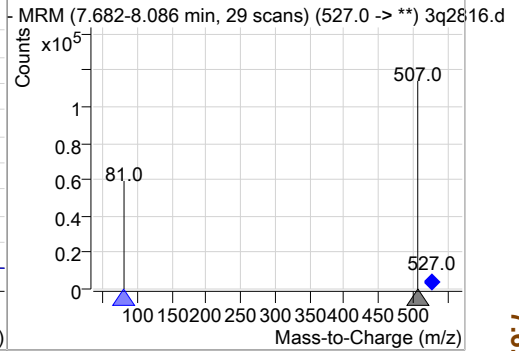
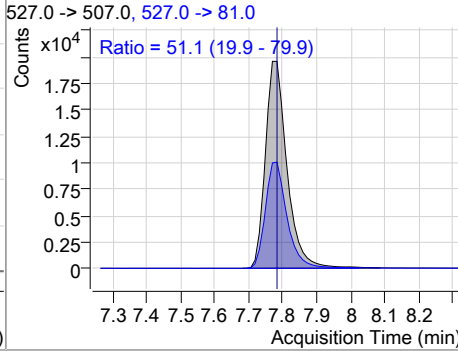
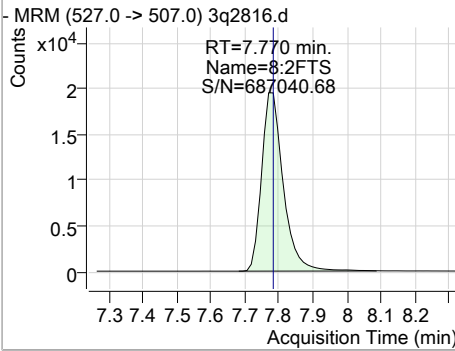


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	48.48	7.78	0.00	67165	570.0 -> 512.0	23.2	0.0	53.5

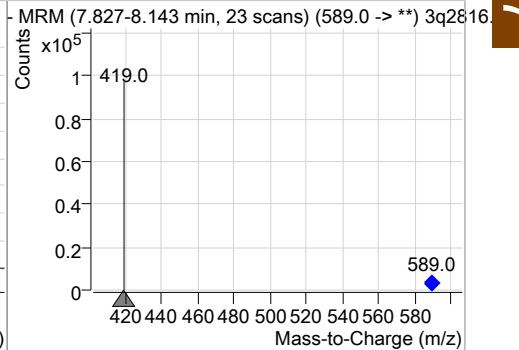
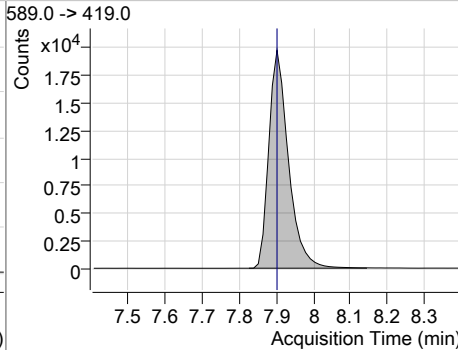
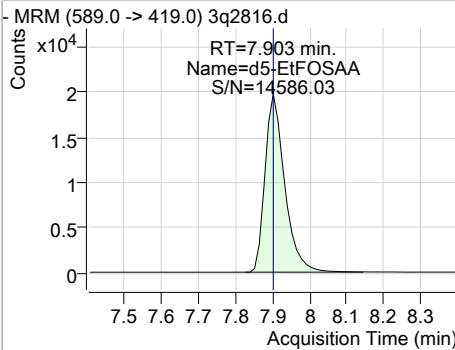


Perfluorinated Compounds by LC/MS/MS

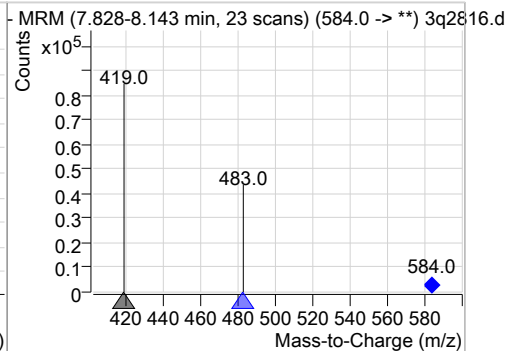
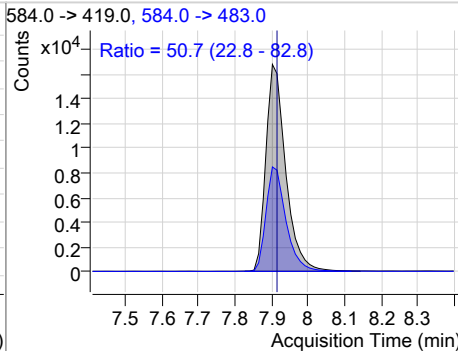
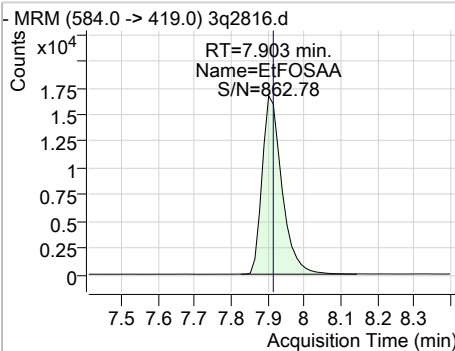
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	46.46	7.77	-0.01	86340	527.0 -> 81.0	51.1	19.9	79.9



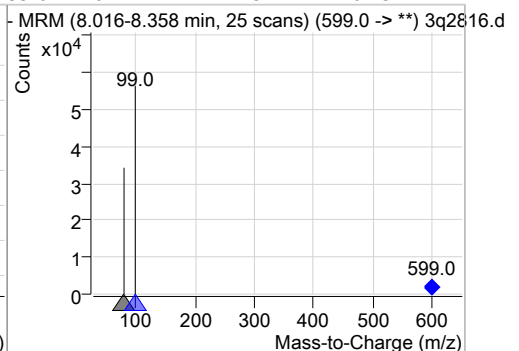
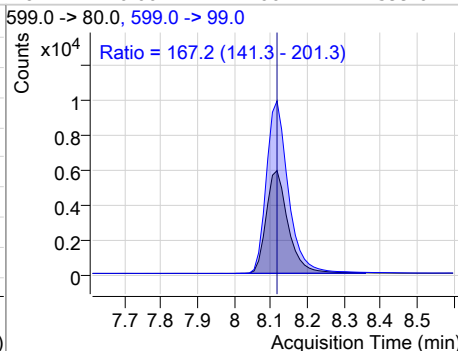
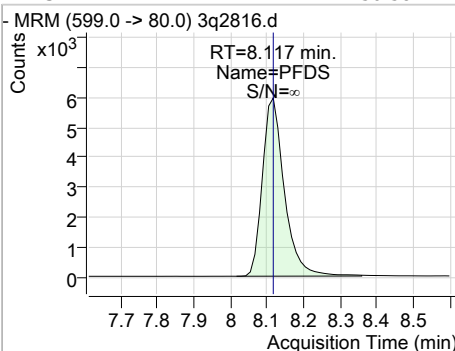
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	48.72	7.90	0.00	72288				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	50.78	7.90	-0.01	62773	584.0 -> 483.0	50.7	22.8	82.8

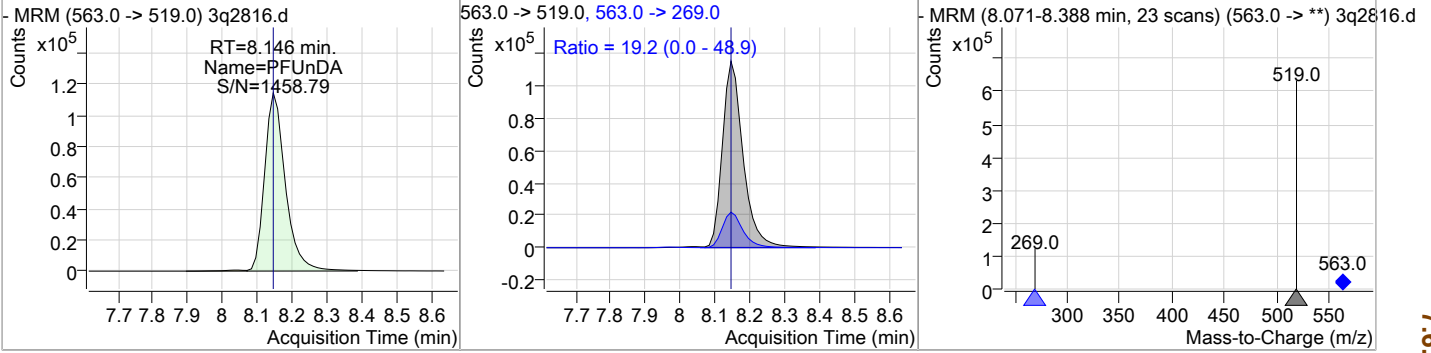


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	50.58	8.12	0.00	24662	599.0 -> 99.0	167.2	141.3	201.3

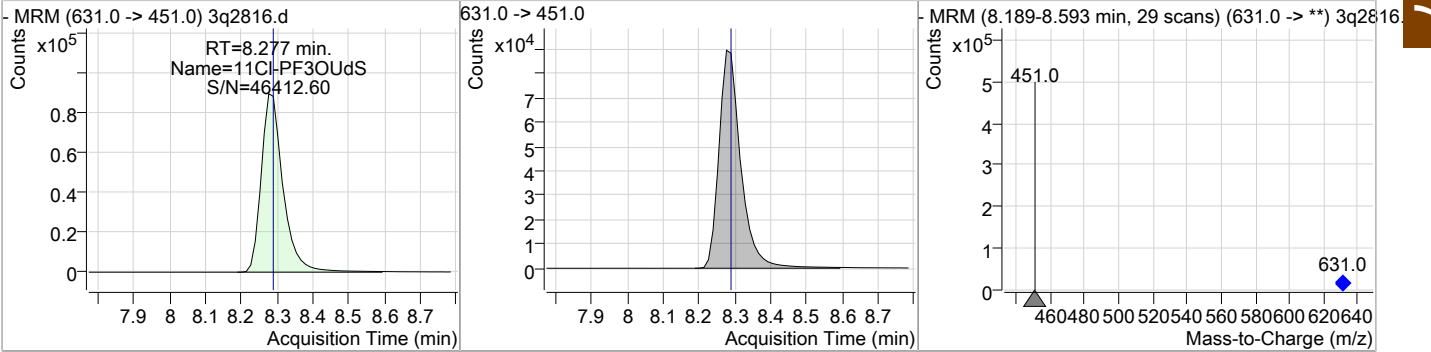


Perfluorinated Compounds by LC/MS/MS

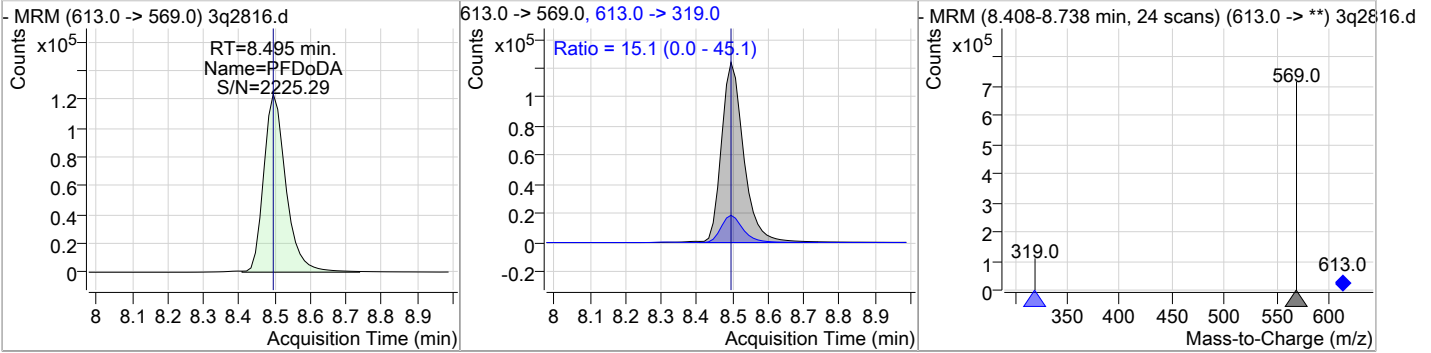
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	49.86	8.15	0.00	474235	563.0 -> 269.0	19.2	0.0	48.9



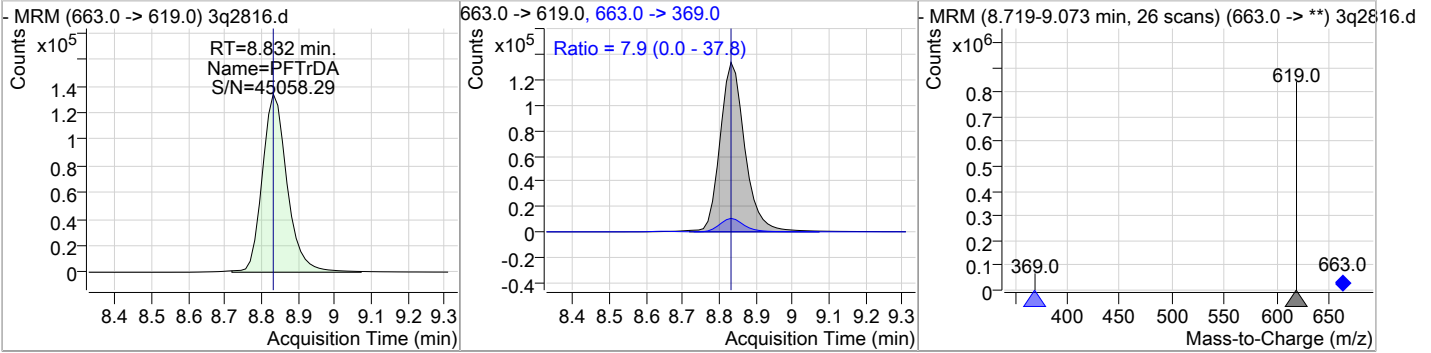
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	49.24	8.28	-0.01	378506	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDODA	49.87	8.50	0.00	535632	613.0 -> 319.0	15.1	0.0	45.1

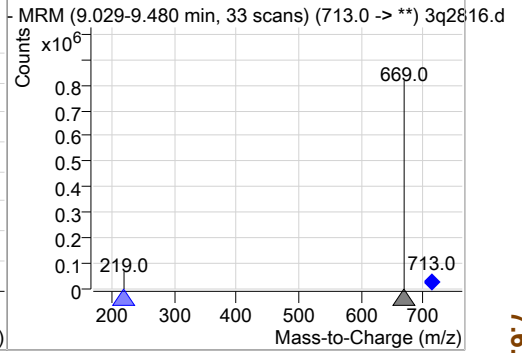
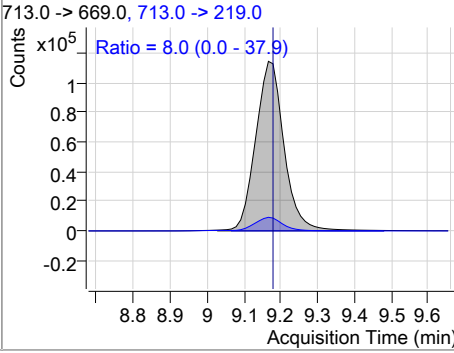
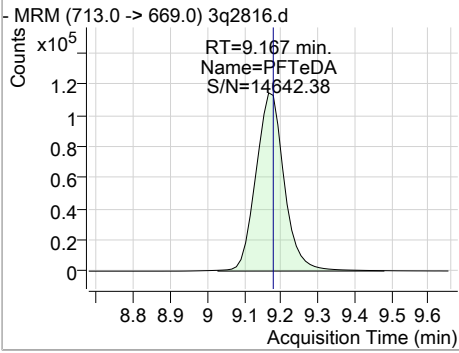


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTrDA	50.52	8.83	0.00	630910	663.0 -> 369.0	7.9	0.0	37.8



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	51.21	9.17	-0.01	608924	713.0 -> 219.0	8.0	0.0	37.9



7.6.7
7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2816.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 16:34 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.7.1

7

Manual Integrations
APPROVED
 (compounds with "m" flag)

Norman Farmer
04/12/19 17:21

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2817.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 4:49:22 PM
 Sample Name : ic72-100
 Vial : P1-A9
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	59869	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	225567	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	199349	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	148092	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	51697	20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	22897	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.746	515.0 -> 470.0	968968	100.02 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 500.1%	
13C2-PFHxA	5.011	315.0 -> 270.0	961742	99.92 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 499.6%	
d5-EtFOSAA	7.903	589.0 -> 419.0	134431	101.19 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 505.9%	
13C3-HFPO-DA	5.303	287.0 -> 169.0	288362	499.76 µg/L	-0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 499.8%	
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	287531	88.70 µg/L	QValue
6:2FTS	6.663	427.0 -> 407.0	240728	83.78 µg/L	100
8:2FTS	7.770	527.0 -> 507.0	161573	82.21 µg/L	99
EtFOSAA	7.903	584.0 -> 419.0	116289	99.86 µg/L	98
FOSA	7.333	498.0 -> 78.0	396758	99.89 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	125567	101.22 µg/L	98
PFBA	1.726	213.0 -> 169.0	273551	101.52 µg/L	100
PFBS	3.928	299.0 -> 80.0	277583	101.19 µg/L	100
PFDA	7.747	513.0 -> 469.0	769571	99.64 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	991156	100.32 µg/L	100
PFDS	8.117	599.0 -> 80.0	44847	99.89 µg/L	99
PFHpA	5.950	363.0 -> 319.0	1372428	101.13 µg/L	99
PFHpS	6.684	449.0 -> 80.0	203251	100.52 µg/L	99
PFHxA	5.012	313.0 -> 269.0	471745	100.99 µg/L	100
PFHxS	5.995	399.0 -> 80.0	225135	100.90 µg/L	m 100
PFNA	7.272	463.0 -> 419.0	910662	100.37 µg/L	100
PFNS	7.717	549.0 -> 80.0	177402	99.86 µg/L	98
PFOA	6.681	413.0 -> 369.0	807965	100.37 µg/L	100
PFOS	7.253	499.0 -> 80.0	284819	100.47 µg/L	m 92
PFPeA	3.612	263.0 -> 219.0	956973	100.32 µg/L	100
PFPeS	5.143	349.0 -> 80.0	176784	99.88 µg/L	100
PFTeDA	9.167	713.0 -> 669.0	1091080	99.75 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	1148798	100.01 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	875934	100.13 µg/L	100
ADONA	6.061	377.0 -> 251.0	1809901	101.07 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	173552	100.94 µg/L	100
11Cl-PF3OUds	8.277	631.0 -> 451.0	714594	100.79 µg/L	100
HFPO-DA	5.295	329.0 -> 169.0	974556	499.83 µg/L	100

7.6.8
7



Perfluorinated Compounds by LC/MS/MS

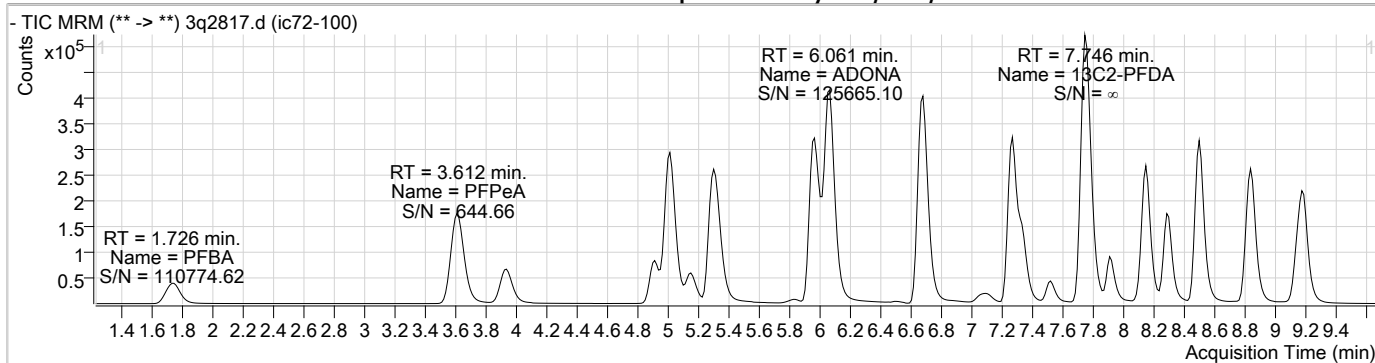
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

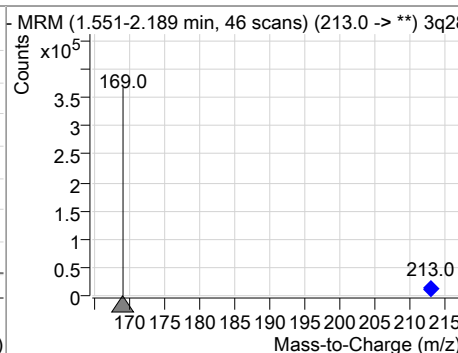
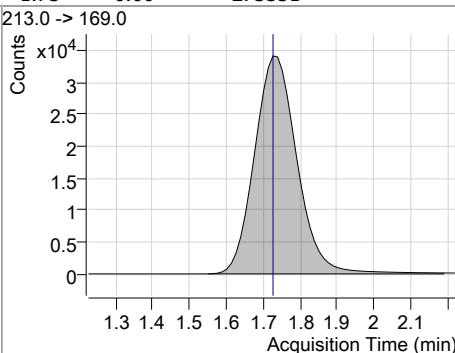
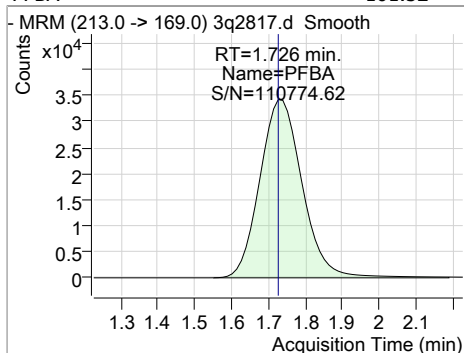
7.6.8

7

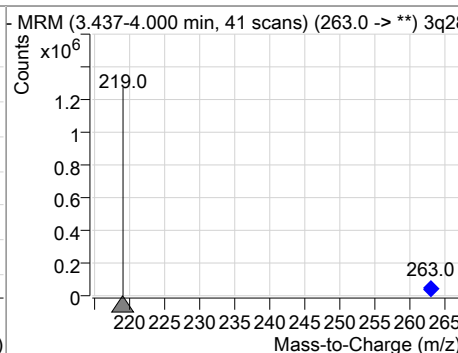
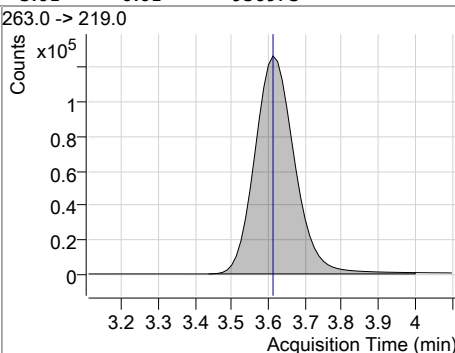
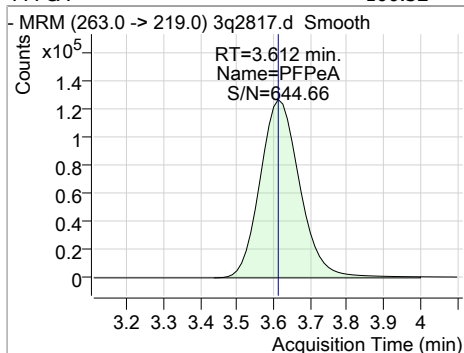
Perfluorinated Compounds by LC/MS/MS



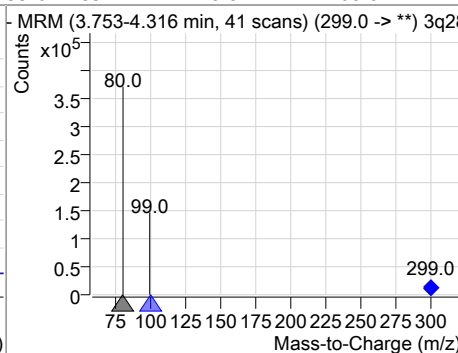
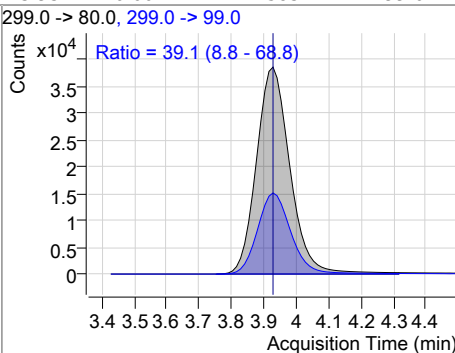
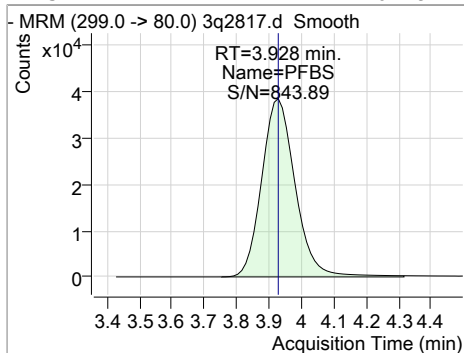
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	101.52	1.73	0.00	273551				



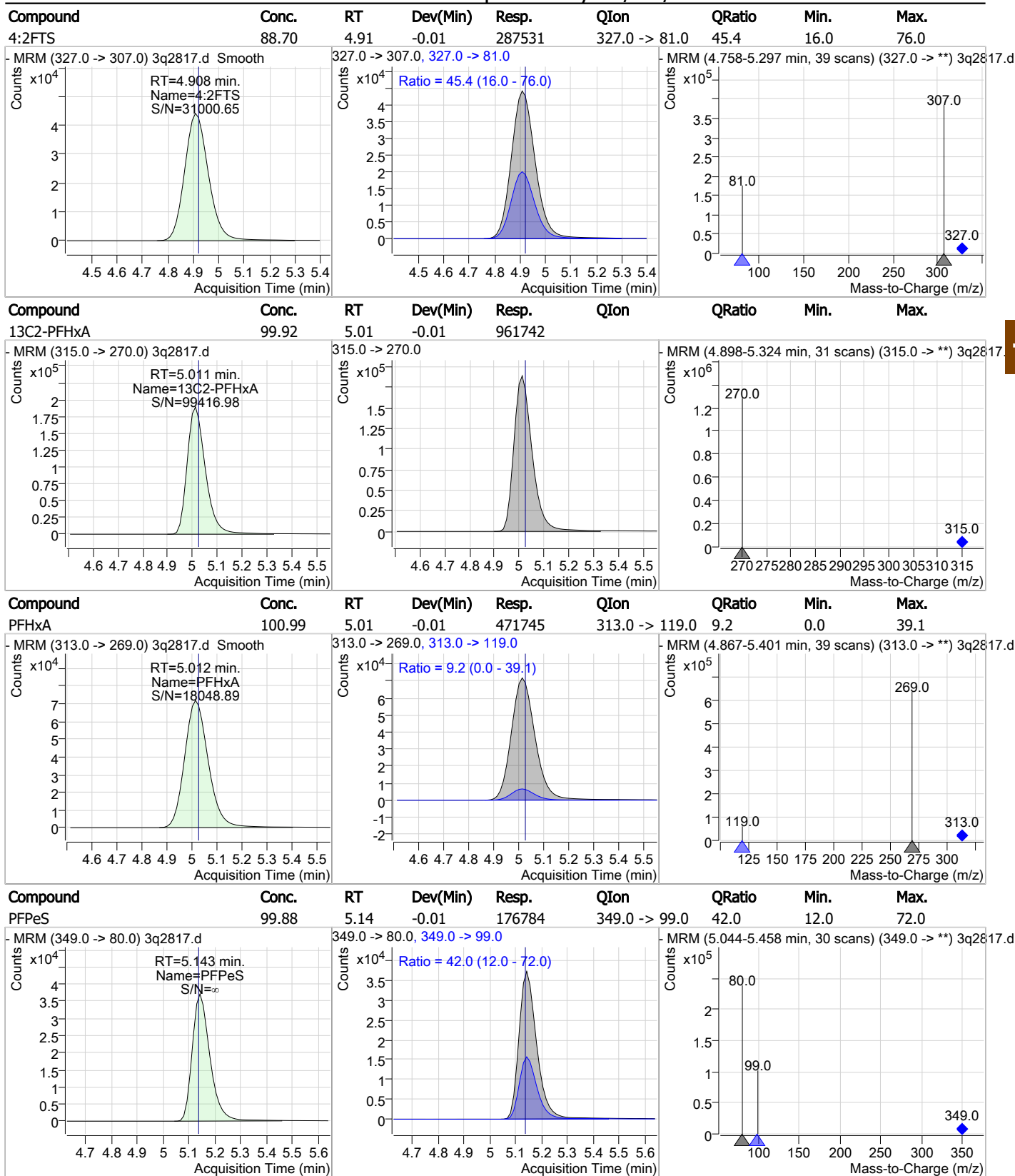
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	100.32	3.61	-0.01	956973				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	101.19	3.93	0.00	277583	299.0 -> 99.0	39.1	8.8	68.8



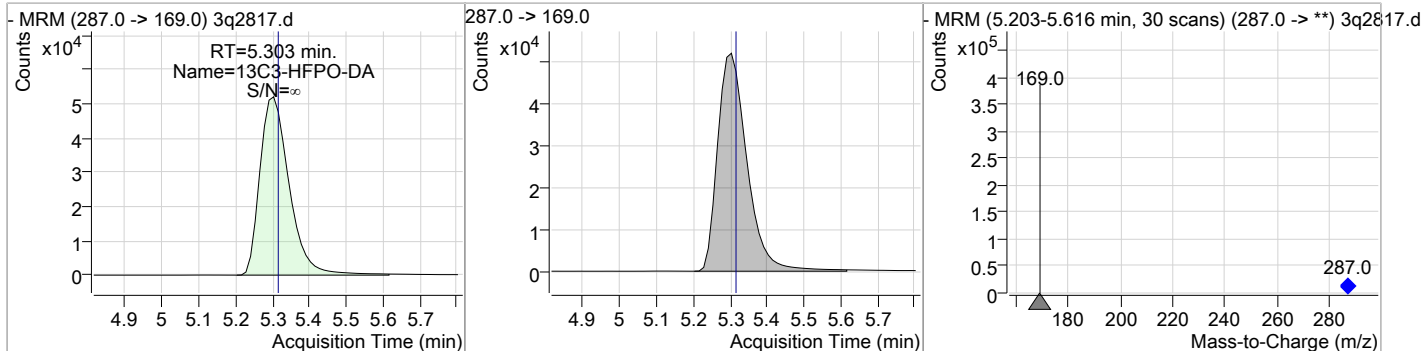
Perfluorinated Compounds by LC/MS/MS



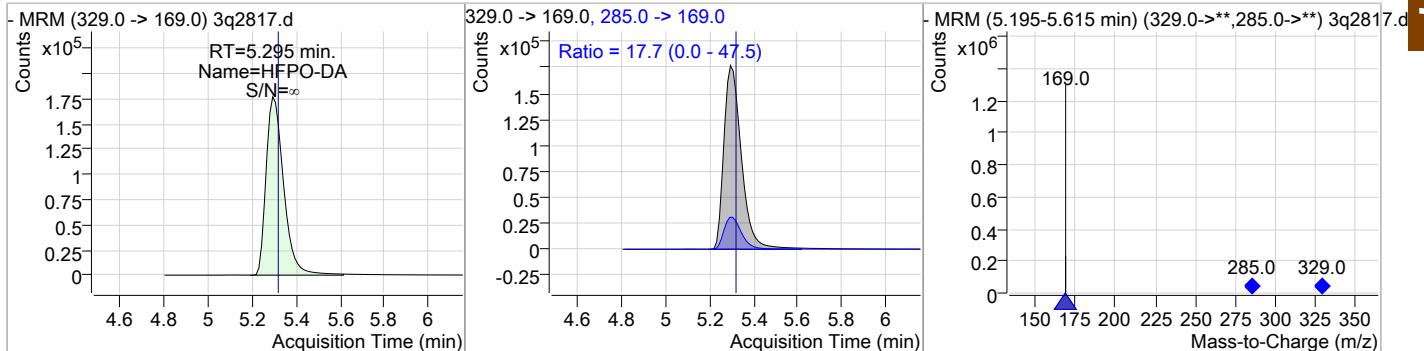
7.6.8

Perfluorinated Compounds by LC/MS/MS

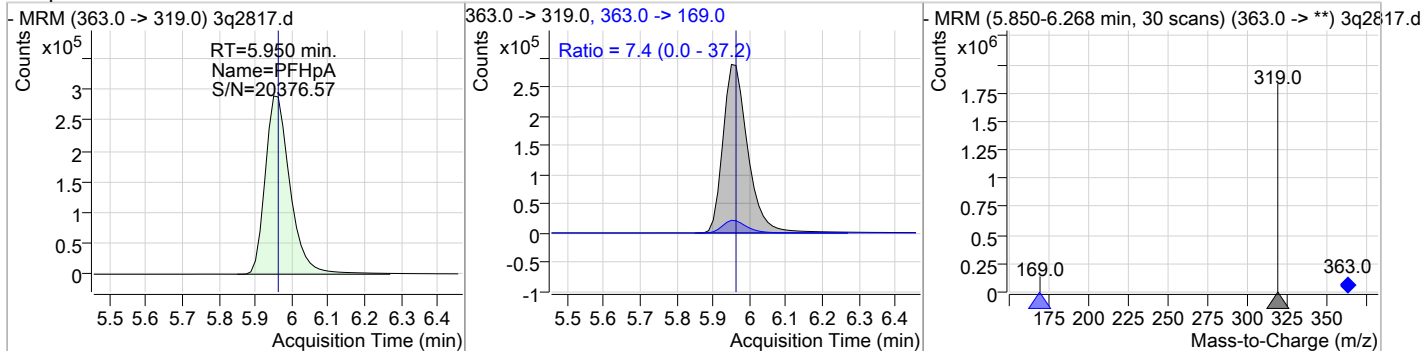
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



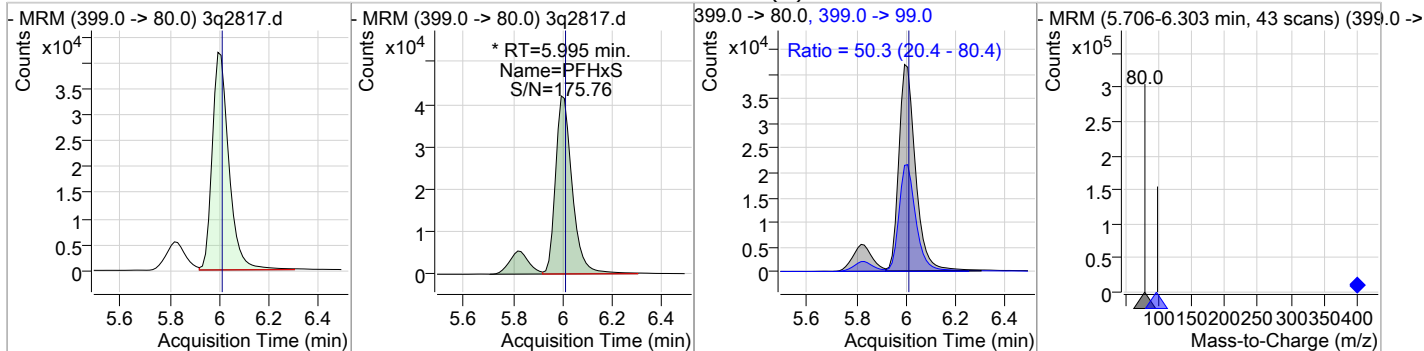
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



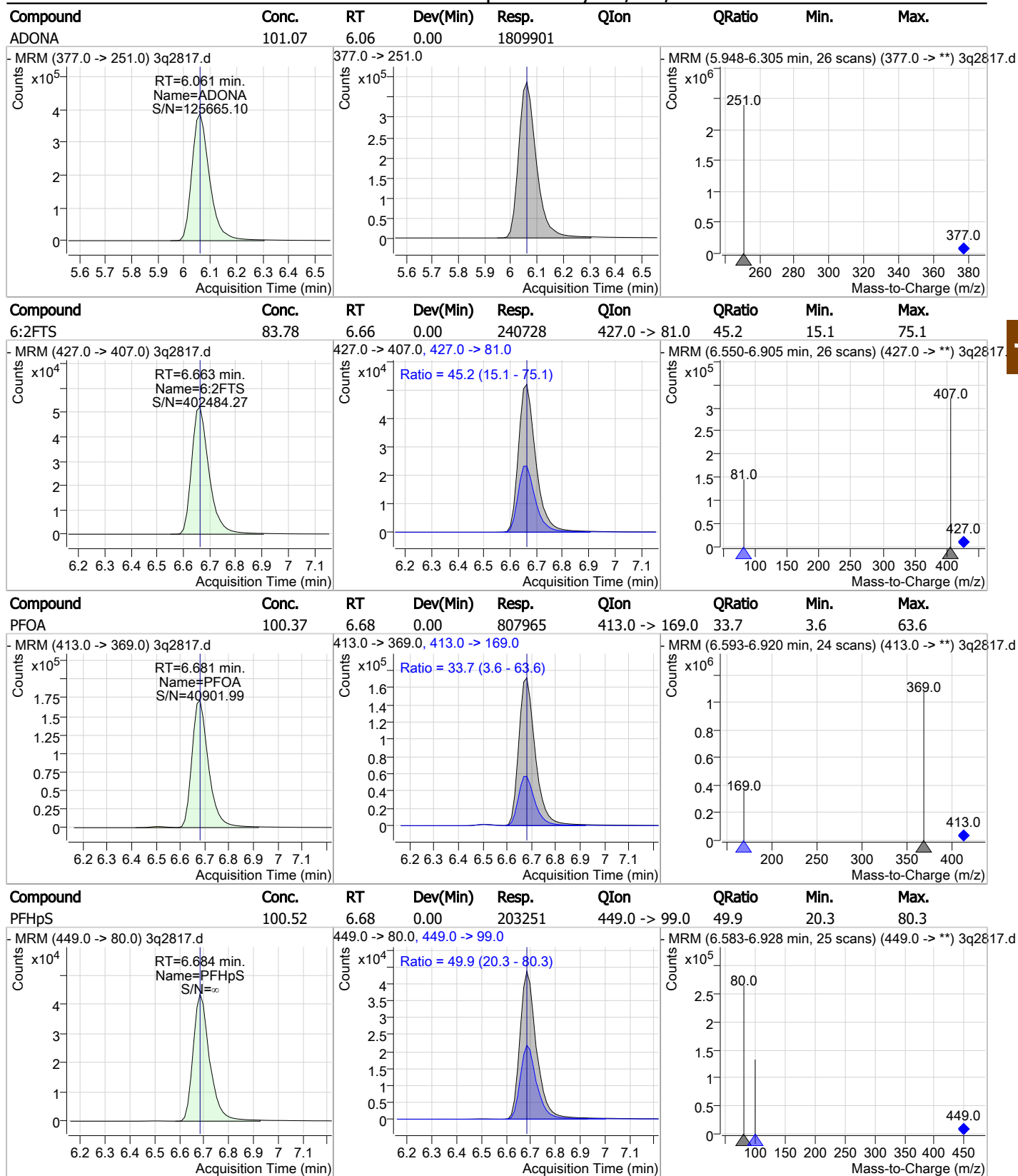
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
----------	-------	----	----------	-------	------	--------	------	------



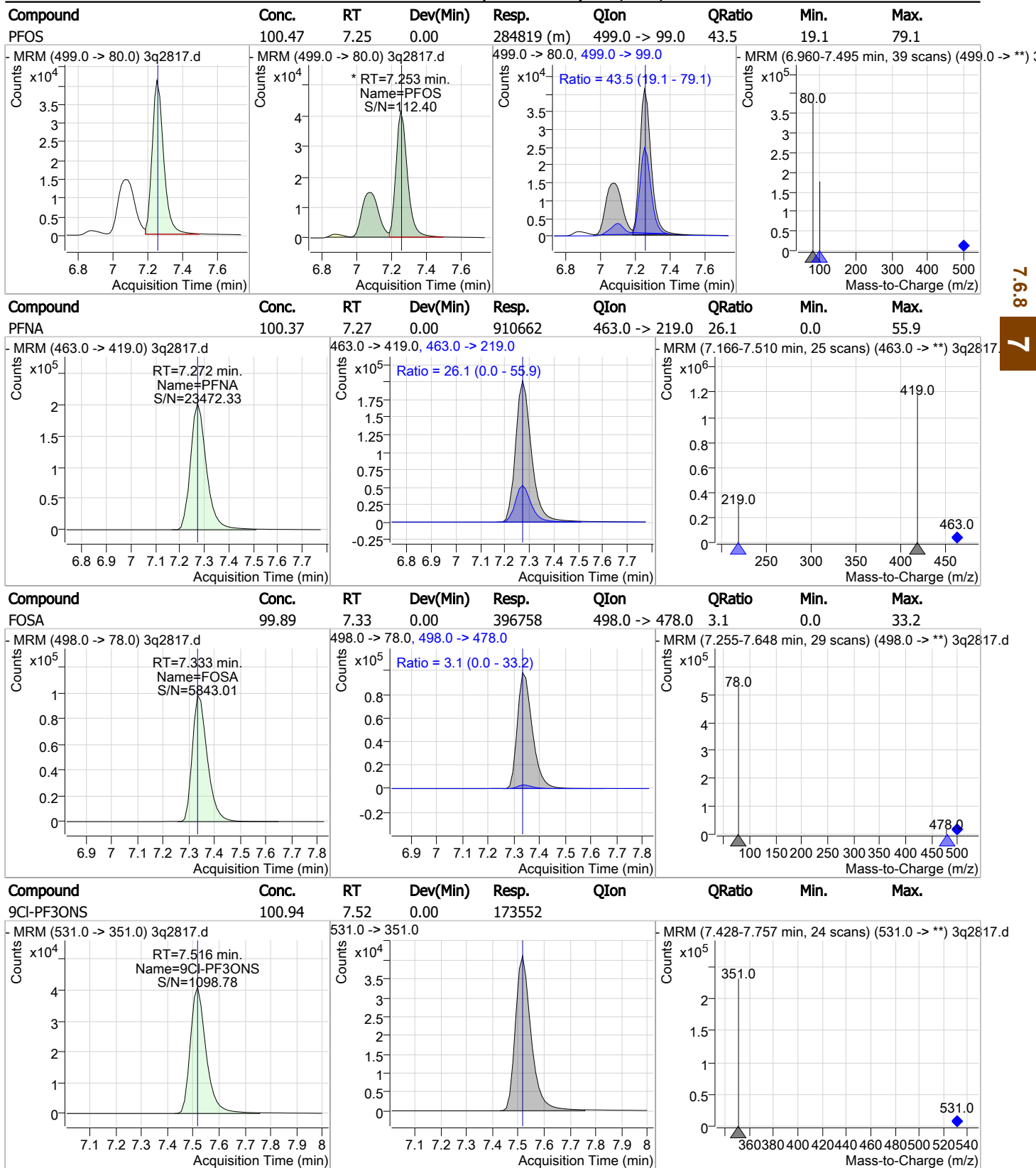
Perfluorinated Compounds by LC/MS/MS



7.6.8



Perfluorinated Compounds by LC/MS/MS

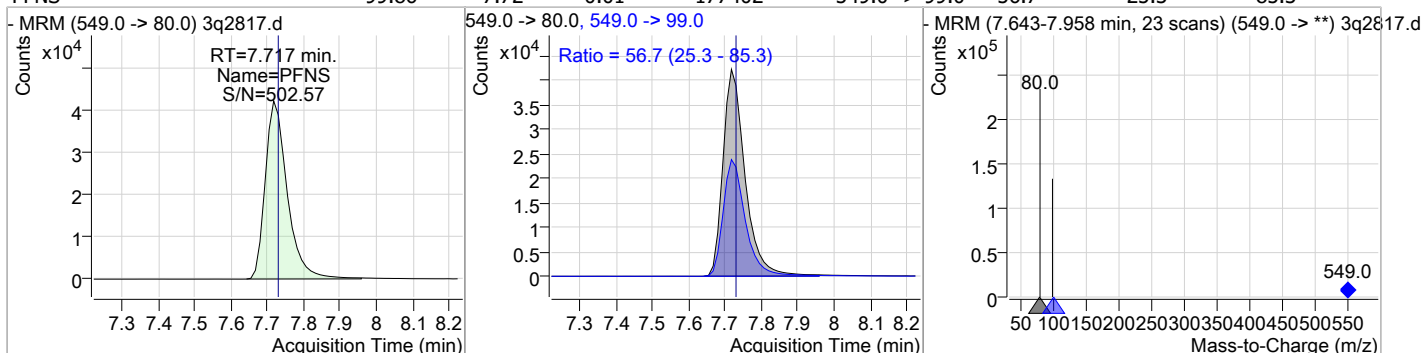


7.6.8
7

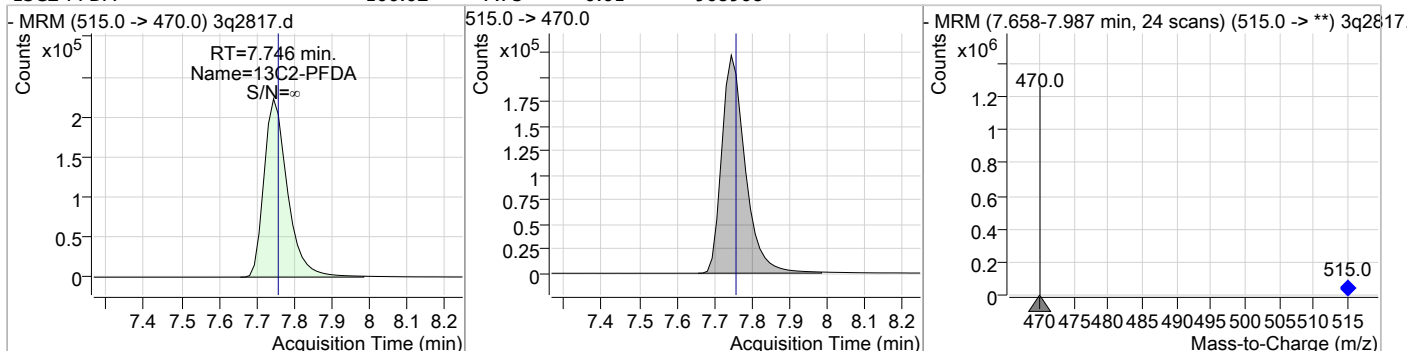


Perfluorinated Compounds by LC/MS/MS

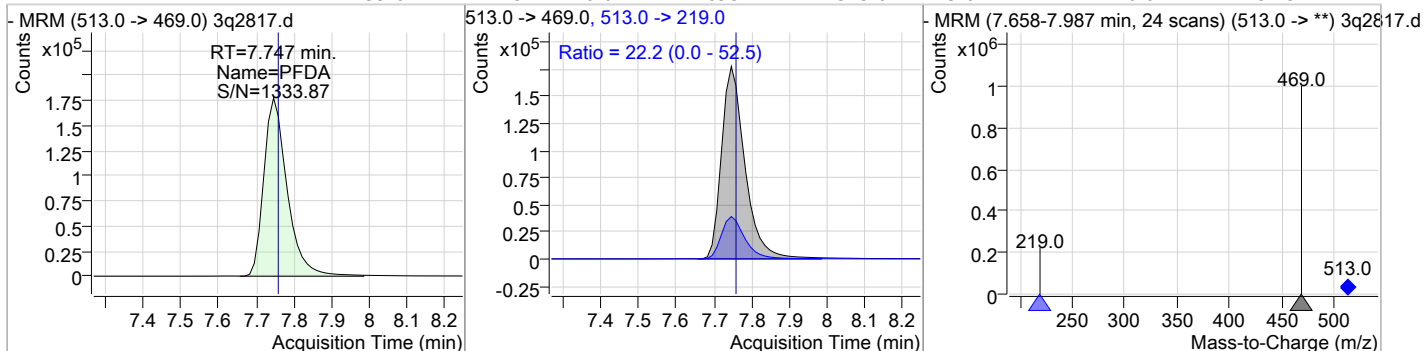
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	99.86	7.72	-0.01	177402	549.0 -> 99.0	56.7	25.3	85.3



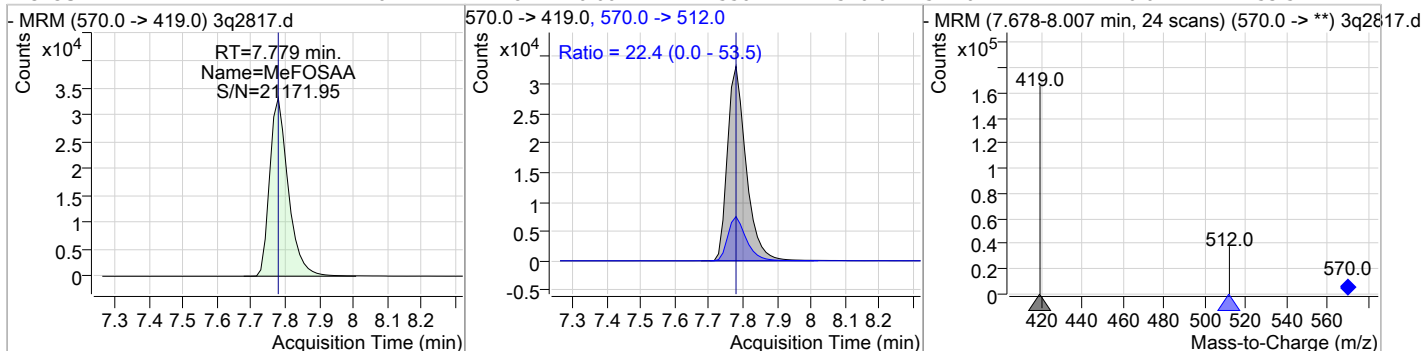
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	100.02	7.75	-0.01	968968				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	99.64	7.75	-0.01	769571	513.0 -> 219.0	22.2	0.0	52.5

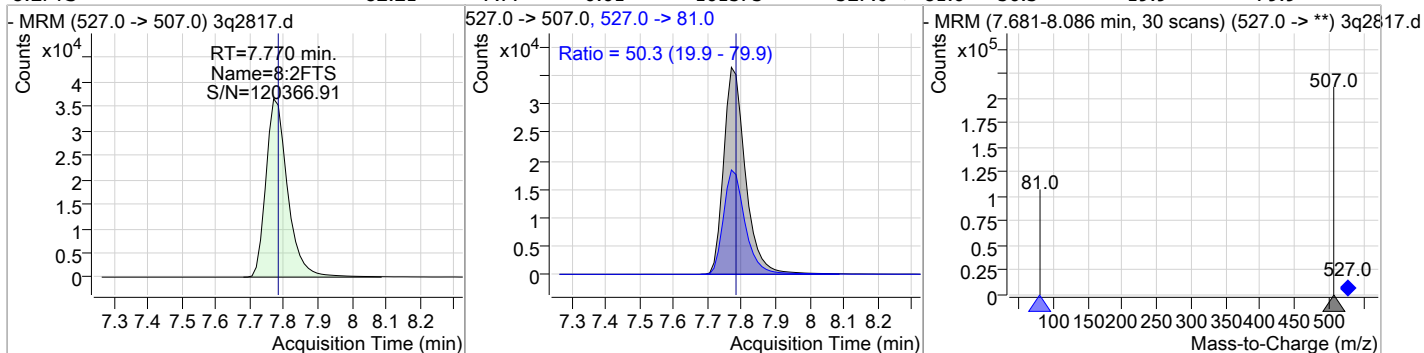


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	101.22	7.78	0.00	125567	570.0 -> 512.0	22.4	0.0	53.5

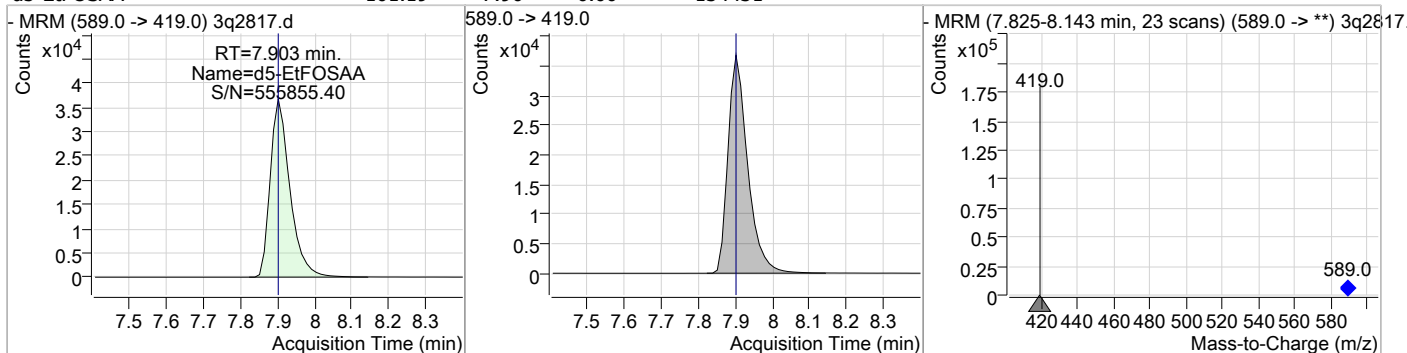


Perfluorinated Compounds by LC/MS/MS

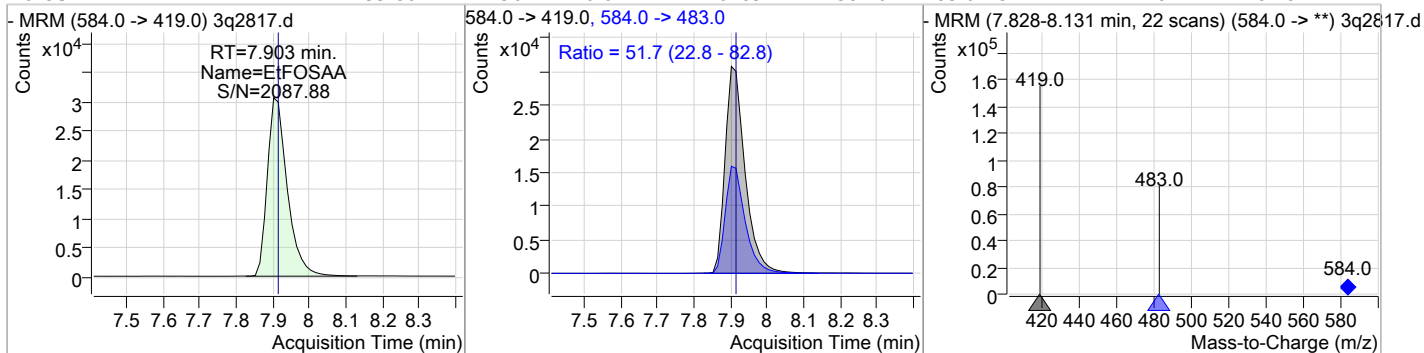
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	82.21	7.77	-0.01	161573	527.0 -> 81.0	50.3	19.9	79.9



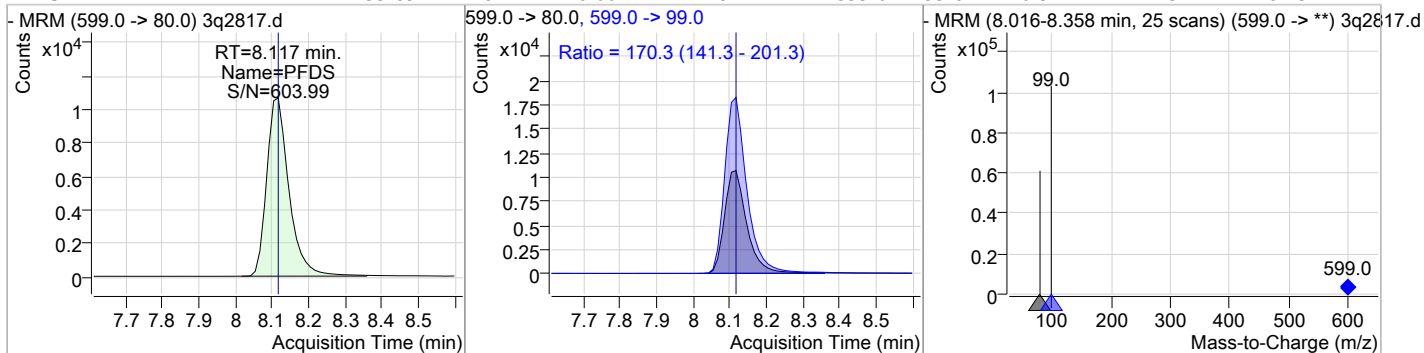
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	101.19	7.90	0.00	134431				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	99.86	7.90	-0.01	116289	584.0 -> 483.0	51.7	22.8	82.8

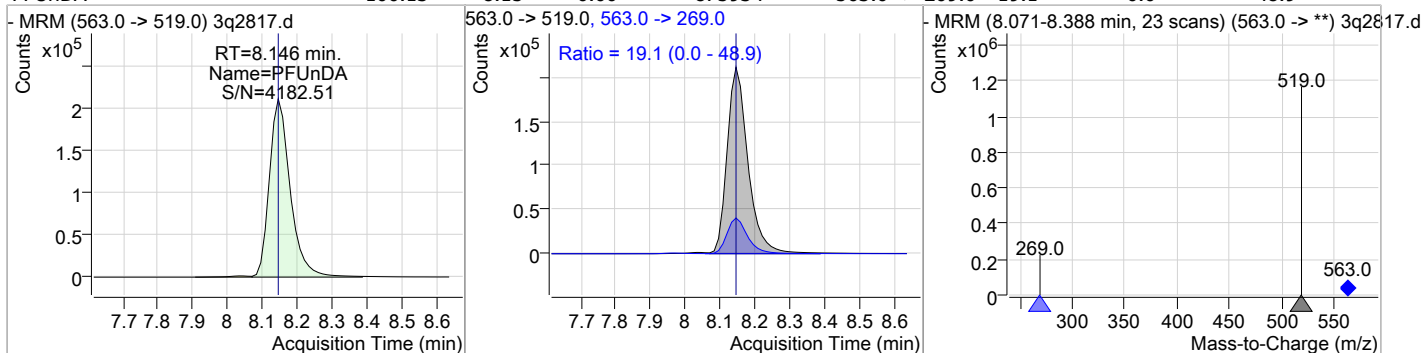


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	99.89	8.12	0.00	44847	599.0 -> 99.0	170.3	141.3	201.3

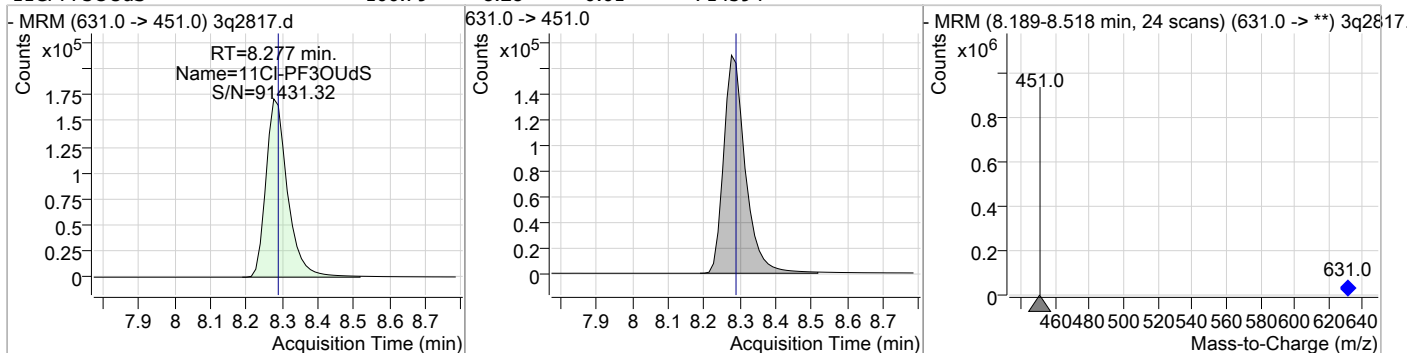


Perfluorinated Compounds by LC/MS/MS

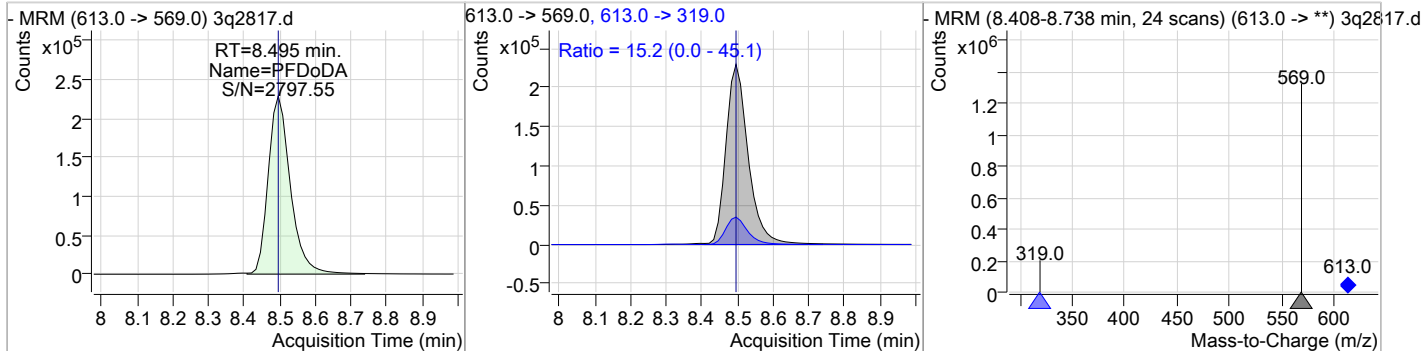
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	100.13	8.15	0.00	875934	563.0 -> 269.0	19.1	0.0	48.9



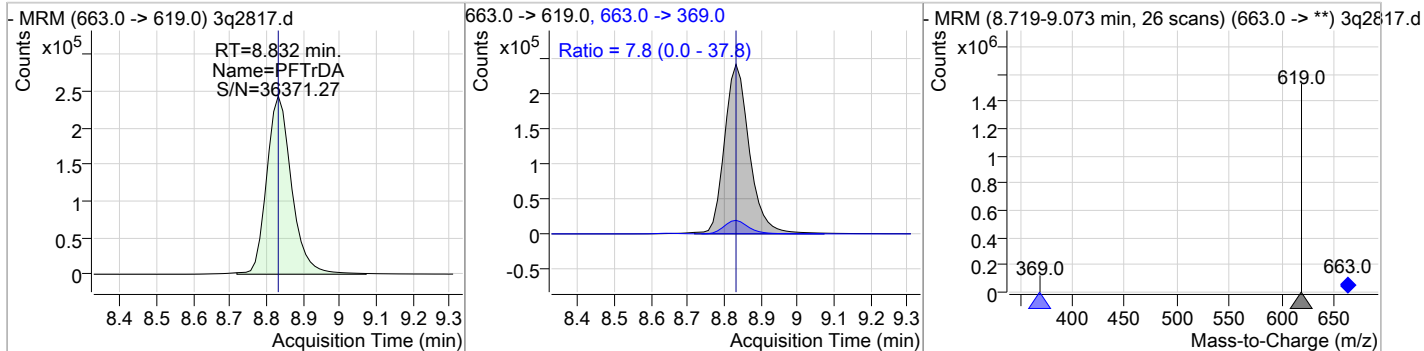
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	100.79	8.28	-0.01	714594	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	100.32	8.50	0.00	991156	613.0 -> 319.0	15.2	0.0	45.1

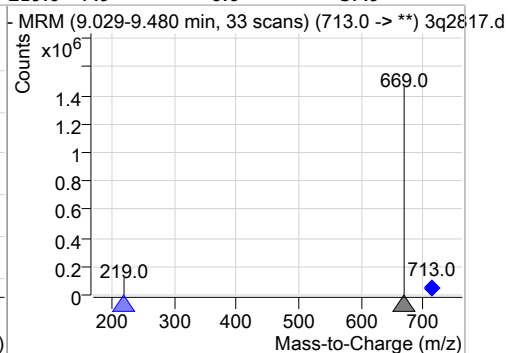
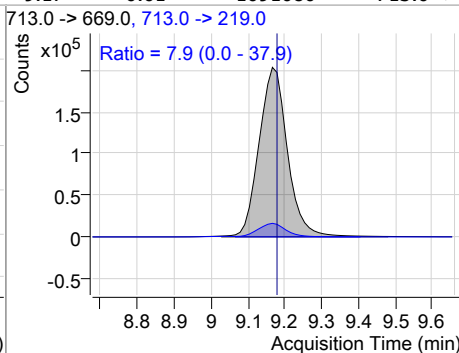
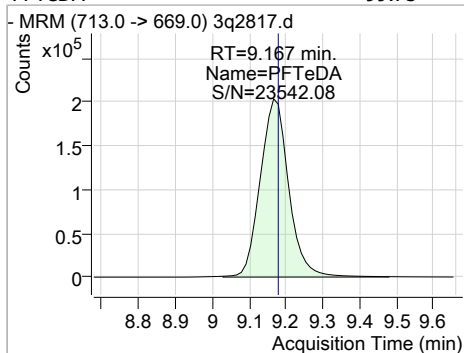


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	100.01	8.83	0.00	1148798	663.0 -> 369.0	7.8	0.0	37.8



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	99.75	9.17	-0.01	1091080	713.0 -> 219.0	7.9	0.0	37.9



7.6.8
7

Manual Integration Approval Summary

Sample Number: S3Q72-IC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2817.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 16:49 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.8.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2818.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 5:04:42 PM
 Sample Name : icv72-20
 Vial : P1-B1
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,,1.0,1,water

Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)	QValue
Internal Standards							
13C2-6:2FTS	6.674	429.0 -> 409.0	49737	20.00	µg/L	0.013	
13C2-PFDoDA	8.494	615.0 -> 570.0	240136	20.00	µg/L	0.000	
13C2-PFOA	6.679	415.0 -> 370.0	215580	20.00	µg/L	0.000	
13C3-PFPeA	3.622	266.0 -> 222.0	145901	20.00	µg/L	0.000	
13C4-PFOS	7.268	503.0 -> 80.0	53456	20.00	µg/L	0.016	
d3-MeFOSAA	7.779	573.0 -> 419.0	27586	20.00	µg/L	0.000	
System Monitoring Compounds							
13C2-PFDA	-	515.0 -> 470.0	-	N.D.			
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%			
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.			
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%			
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.			
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%			
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.			
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%			
Target Compounds							
4:2FTS	-	327.0 -> 307.0	-	N.D.			
6:2FTS	-	427.0 -> 407.0	-	N.D.			
8:2FTS	-	527.0 -> 507.0	-	N.D.			
EtFOSAA	7.916	584.0 -> 419.0	20415	15.90	µg/L m	96	
FOSA	-	498.0 -> 78.0	-	N.D.			
MeFOSAA	7.779	570.0 -> 419.0	26119	17.48	µg/L m	93	
PFBA	-	213.0 -> 169.0	-	N.D.			
PFBS	-	299.0 -> 80.0	-	N.D.			
PFDA	-	513.0 -> 469.0	-	N.D.			
PFDoDA	-	613.0 -> 569.0	-	N.D.			
PFDS	-	599.0 -> 80.0	-	N.D.			
PFHpA	-	363.0 -> 319.0	-	N.D.			
PFHpS	-	449.0 -> 80.0	-	N.D.			
PFHxA	-	313.0 -> 269.0	-	N.D.			
PFHxS	6.007	399.0 -> 80.0	0	0.00	µg/L m	1	
PFNA	-	463.0 -> 419.0	-	N.D.			
PFNS	-	549.0 -> 80.0	-	N.D.			
PFOA	6.681	413.0 -> 369.0	156287	17.95	µg/L m	95	
PFOS	7.269	499.0 -> 80.0	60719	20.71	µg/L m	87	
PFPeA	-	263.0 -> 219.0	-	N.D.			
PFPeS	-	349.0 -> 80.0	-	N.D.			
PFTeDA	-	713.0 -> 669.0	-	N.D.			
PFTrDA	-	663.0 -> 619.0	-	N.D.			
PFUnDA	-	563.0 -> 519.0	-	N.D.			
ADONA	-	377.0 -> 251.0	-	N.D.			
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.			
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.			
HFPO-DA	-	329.0 -> 169.0	-	N.D.			

7.6.9
7



Perfluorinated Compounds by LC/MS/MS

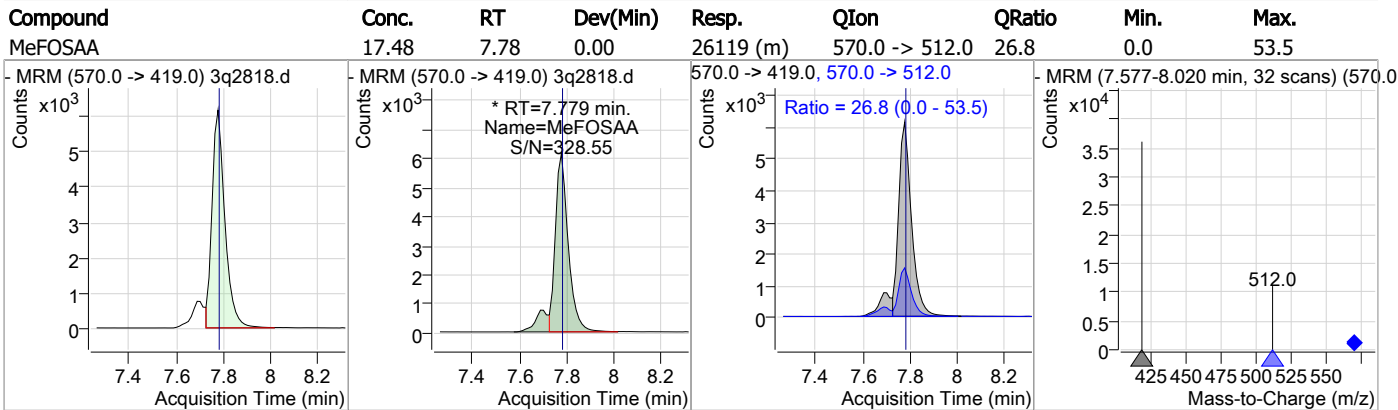
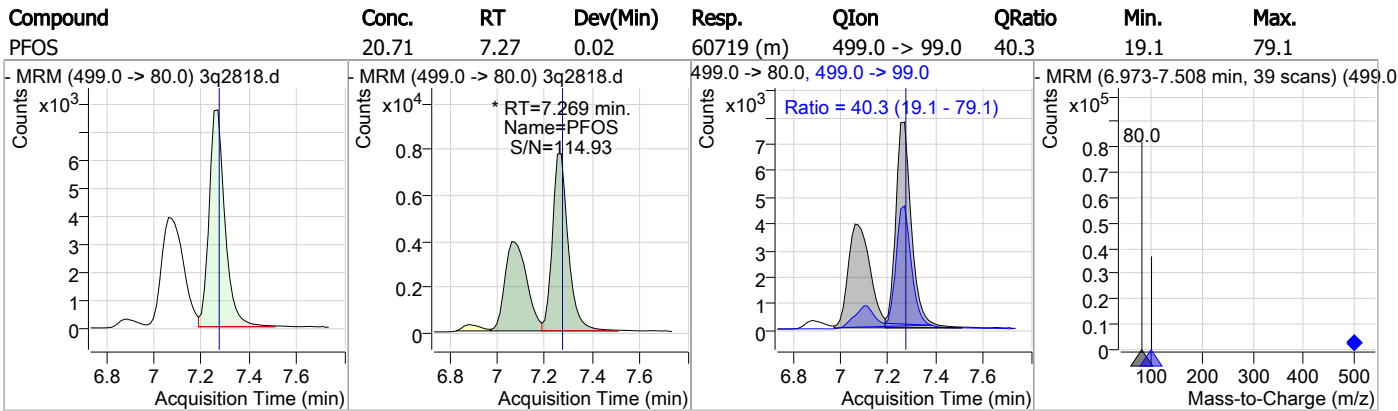
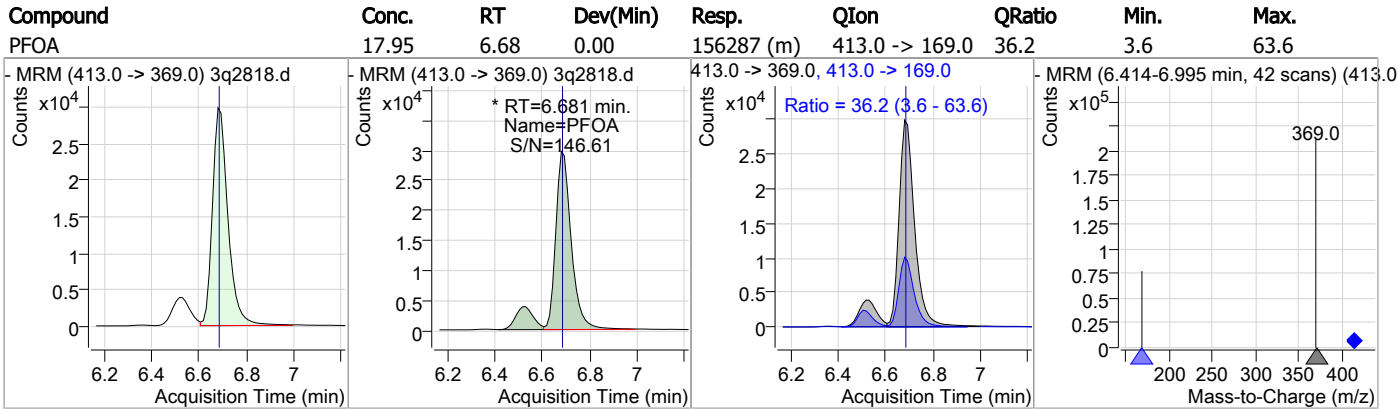
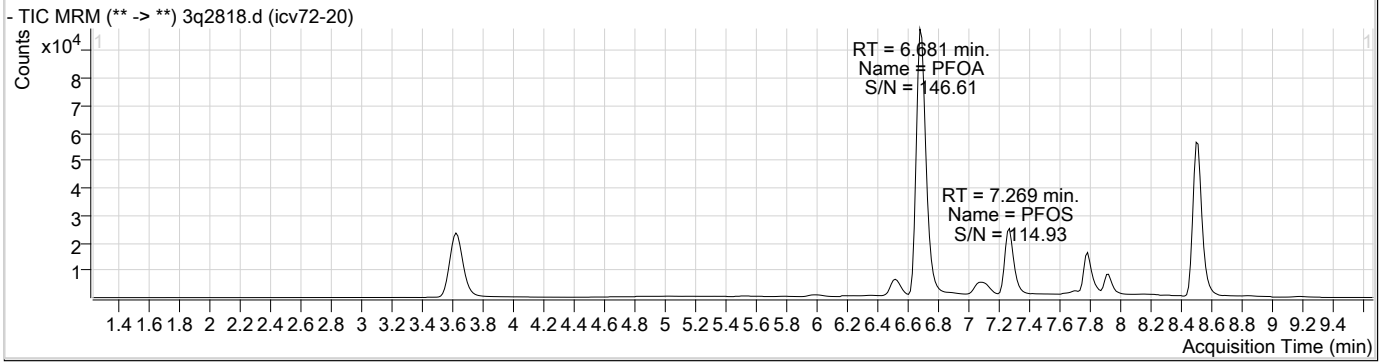
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

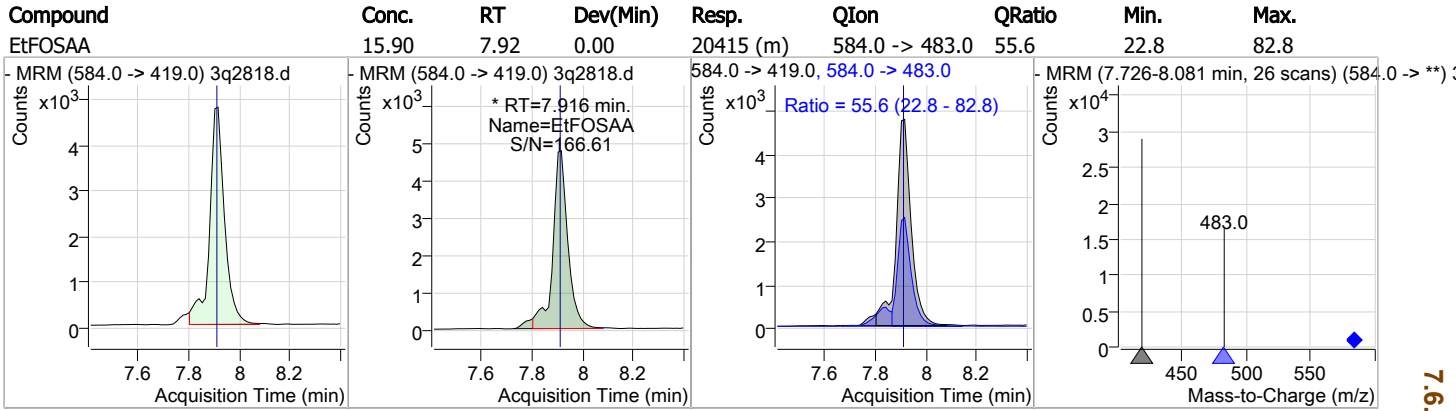
7.6.9

7

Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



7.6.9
7

Manual Integration Approval Summary

Sample Number: S3Q72-ICV72 **Method:** EPA 537 MOD
Lab FileID: 3Q2818.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 17:04 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorooctanoic acid	335-67-1		6.68	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.27	Split peak
MeFOSAA	2355-31-9		7.78	Split peak
EtFOSAA	2991-50-6		7.92	Split peak

7.6.9.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2819.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 5:20:03 PM
 Sample Name : icv72-20
 Vial : P1-B2
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	53578	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	246090	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	225618	20.00 µg/L	0.000
13C3-PFPeA	3.622	266.0 -> 222.0	155173	20.00 µg/L	0.000
13C4-PFOS	7.252	503.0 -> 80.0	56959	20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	28423	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	-	515.0 -> 470.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	
Target Compounds					
4:2FTS	4.921	327.0 -> 307.0	49385	17.02 µg/L	QValue 100
6:2FTS	6.663	427.0 -> 407.0	45923	17.86 µg/L	99
8:2FTS	7.784	527.0 -> 507.0	32207	18.31 µg/L	98
EtFOSAA	7.903	584.0 -> 419.0	24298	18.32 µg/L	98
FOSA	7.333	498.0 -> 78.0	86767	18.29 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	27207	17.67 µg/L	98
PFBA	1.726	213.0 -> 169.0	51023	16.73 µg/L	100
PFBS	3.928	299.0 -> 80.0	45736	15.13 µg/L	99
PFDA	7.759	513.0 -> 469.0	158762	18.16 µg/L	100
PFDoDA	8.495	613.0 -> 569.0	205728	19.09 µg/L	100
PFDS	8.117	599.0 -> 80.0	8596	17.38 µg/L	96
PFHpA	5.962	363.0 -> 319.0	275790	17.96 µg/L	100
PFHpS	6.684	449.0 -> 80.0	37920	17.02 µg/L	99
PFHxA	5.025	313.0 -> 269.0	83567	15.81 µg/L	100
PFHxS	6.007	399.0 -> 80.0	37606	15.30 µg/L	m 97
PFNA	7.272	463.0 -> 419.0	175689	17.11 µg/L	99
PFNS	7.730	549.0 -> 80.0	34814	17.79 µg/L	99
PFOA	6.681	413.0 -> 369.0	164997	18.11 µg/L	100
PFOS	7.253	499.0 -> 80.0	57060	18.27 µg/L	m 97
PFPeA	3.625	263.0 -> 219.0	173796	17.39 µg/L	100
PFPeS	5.155	349.0 -> 80.0	28699	15.47 µg/L	98
PFTeDA	9.167	713.0 -> 669.0	195340	16.37 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	246005	19.63 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	186520	19.54 µg/L	100
ADONA	-	377.0 -> 251.0	-	N.D.	
9Cl-PF3ONS	-	531.0 -> 351.0	-	N.D.	
11Cl-PF3OUdS	-	631.0 -> 451.0	-	N.D.	
HFPO-DA	-	329.0 -> 169.0	-	N.D.	

7.6.10
7

Perfluorinated Compounds by LC/MS/MS

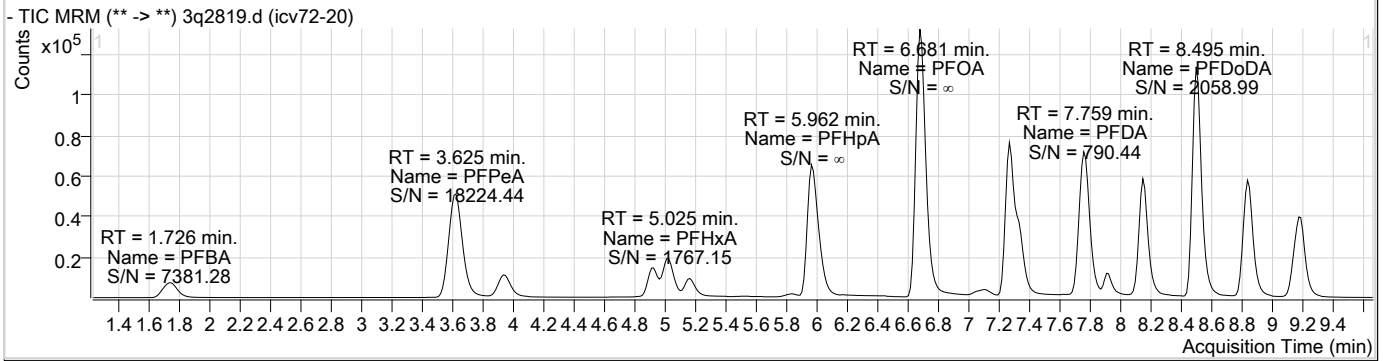
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

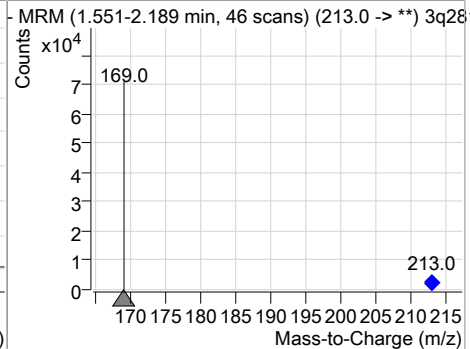
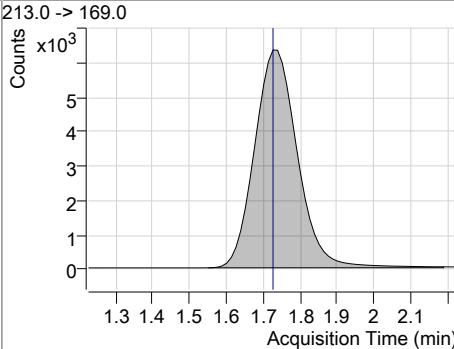
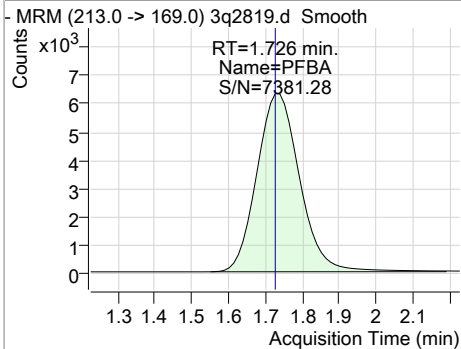
7.6.10

7

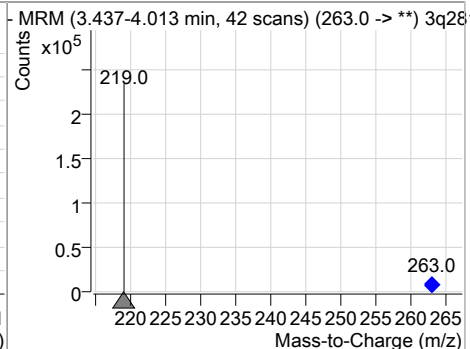
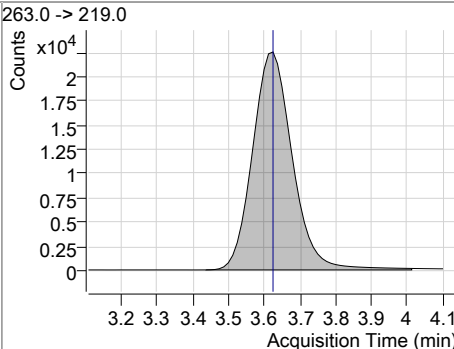
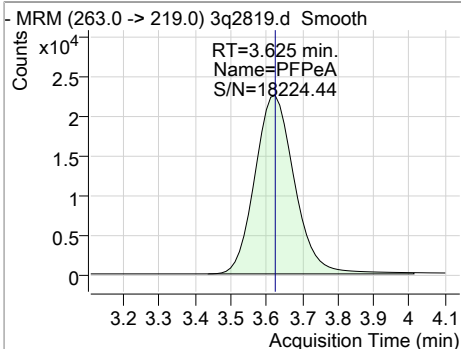
Perfluorinated Compounds by LC/MS/MS



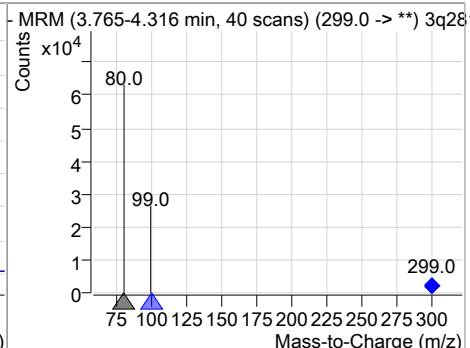
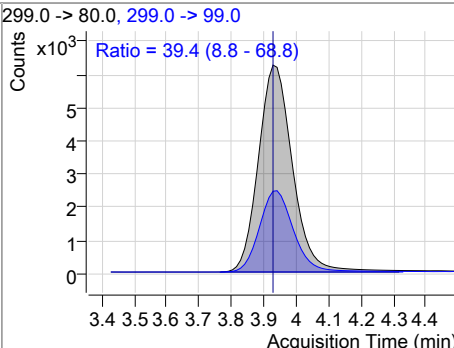
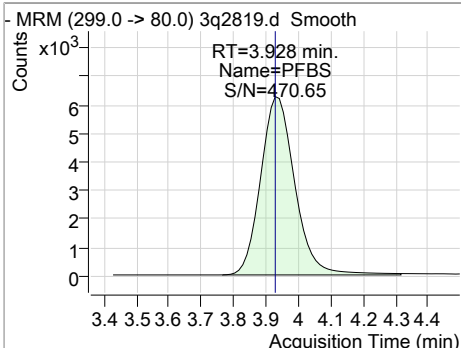
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	16.73	1.73	0.00	51023				



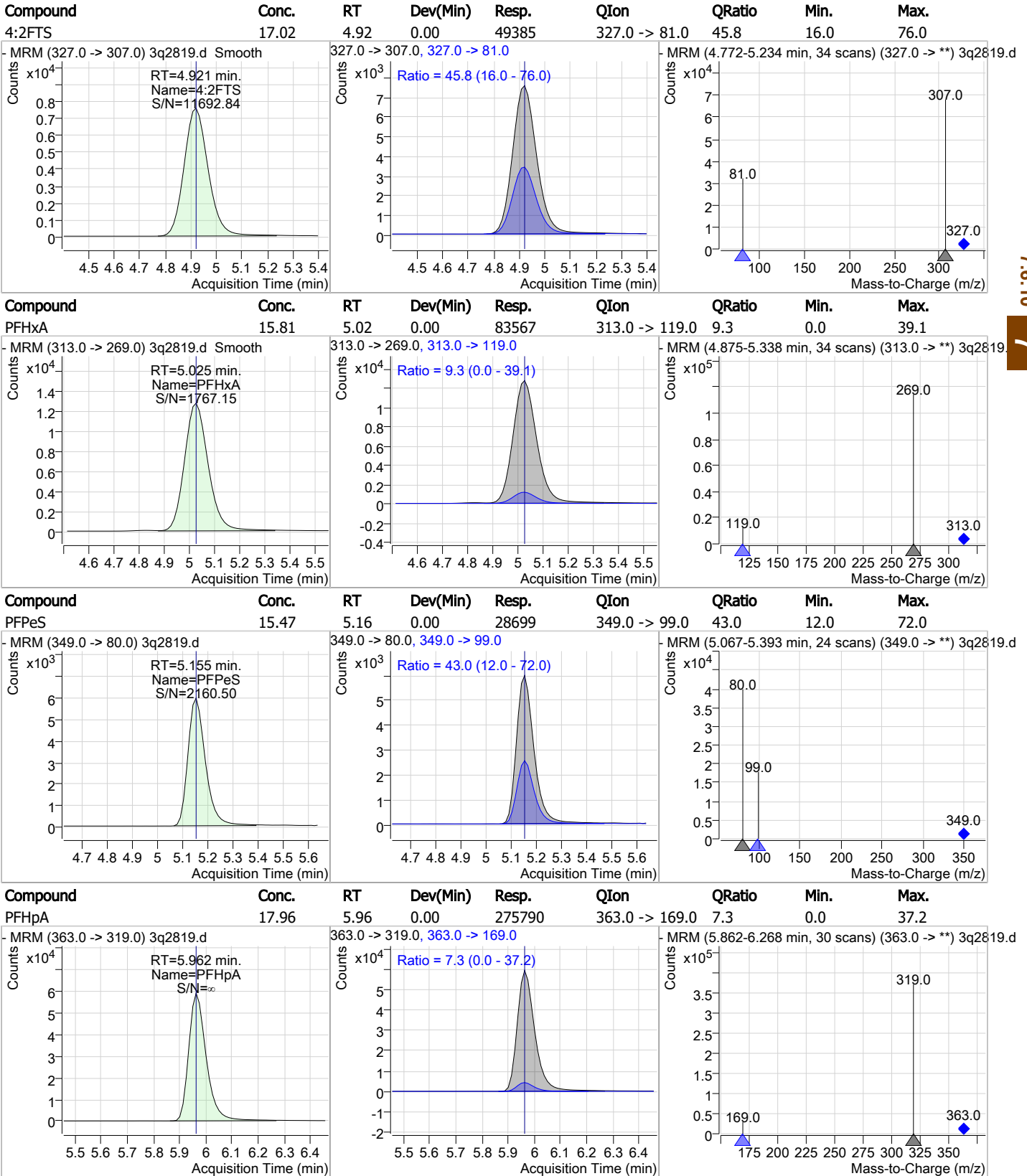
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	17.39	3.62	0.00	173796				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	15.13	3.93	0.00	45736	299.0 -> 99.0	39.4	8.8	68.8



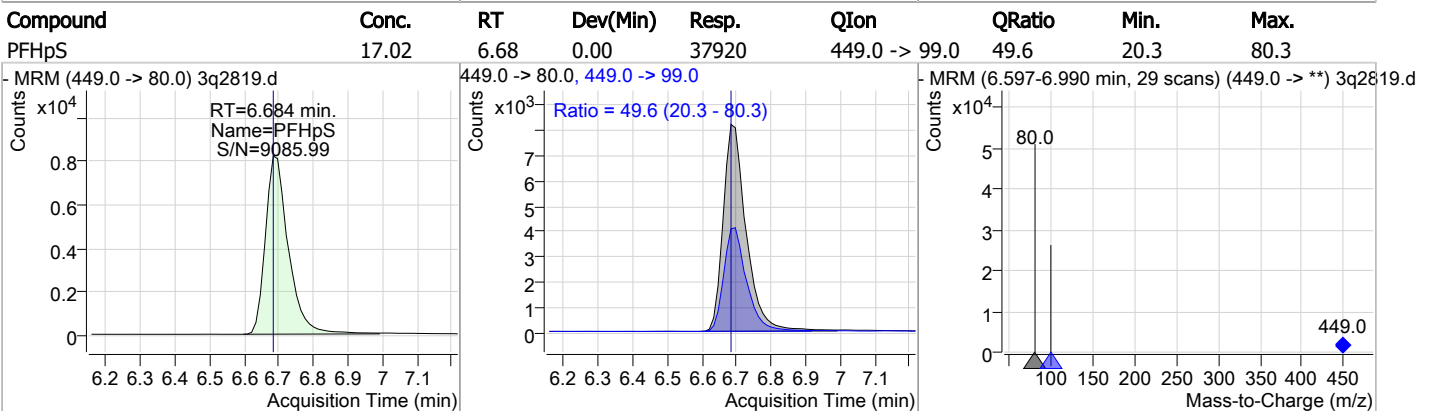
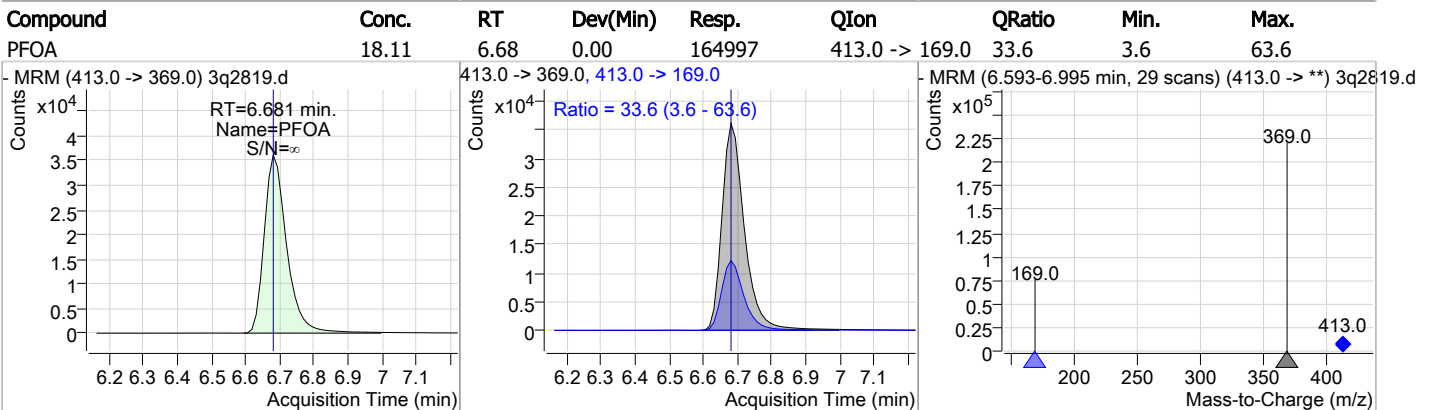
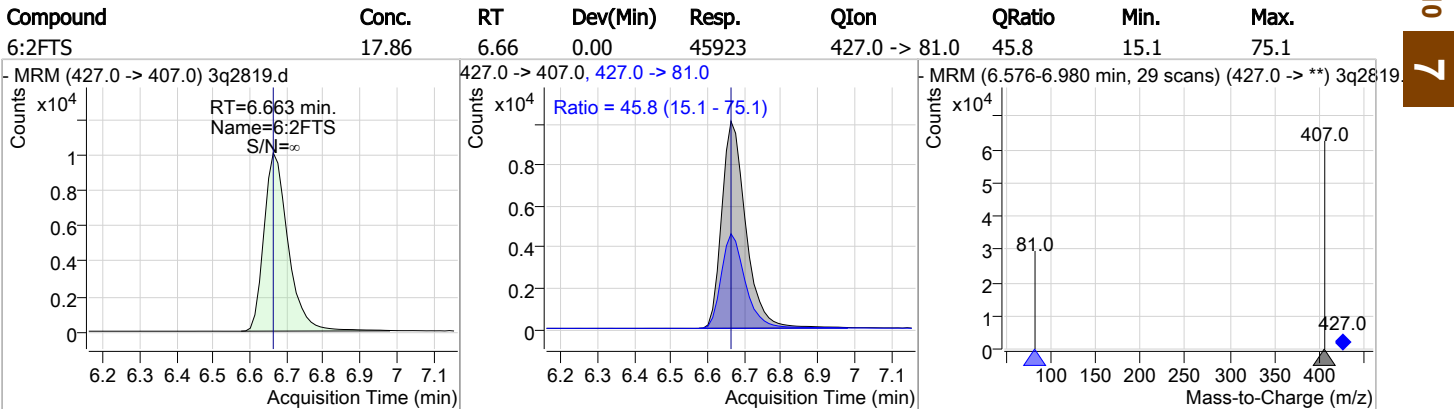
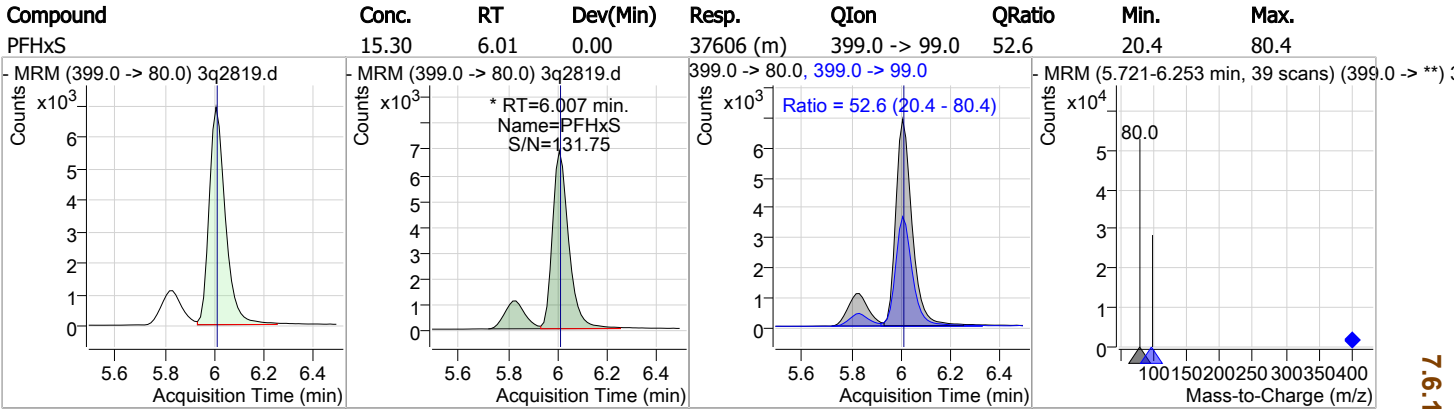
Perfluorinated Compounds by LC/MS/MS



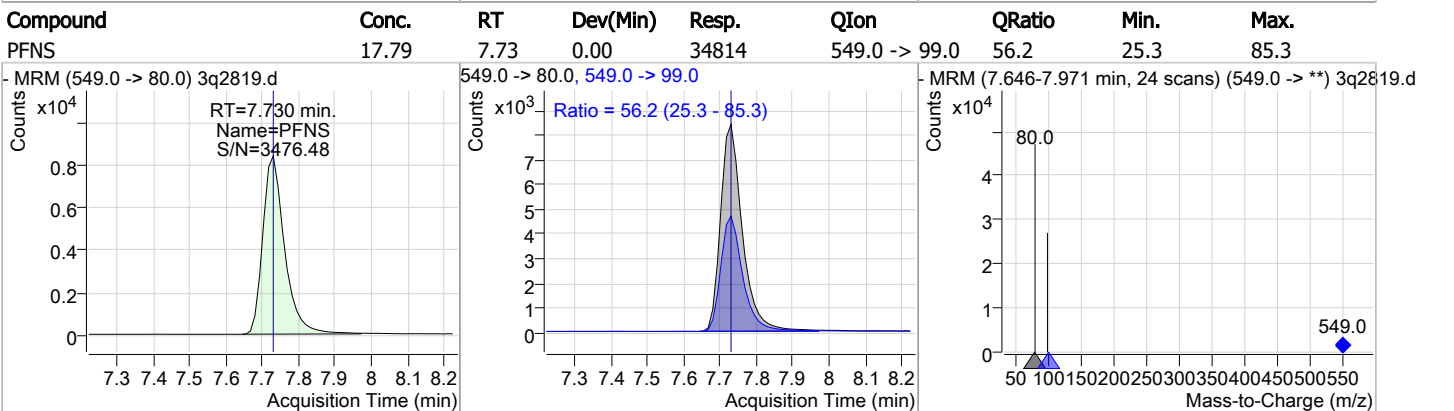
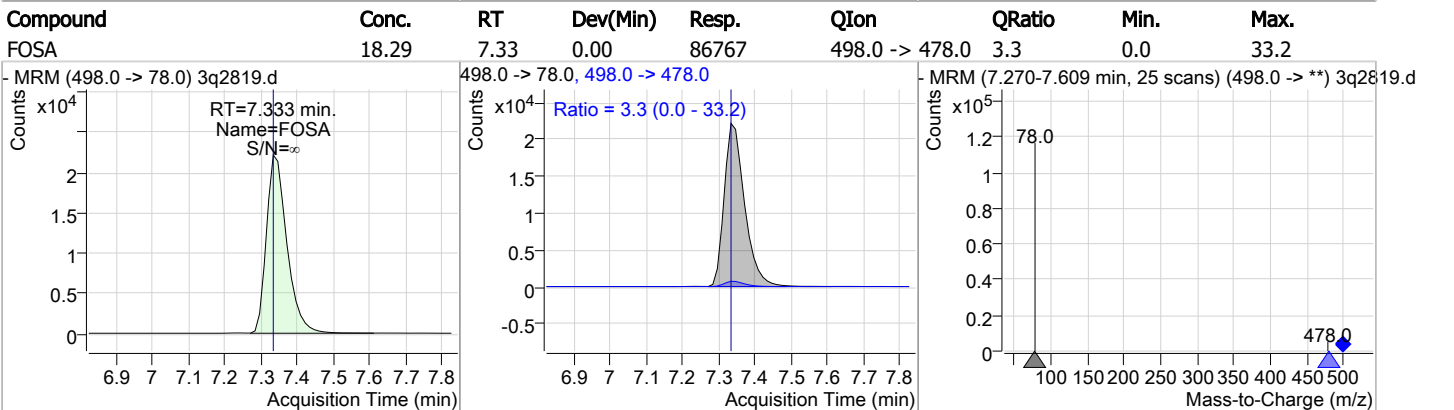
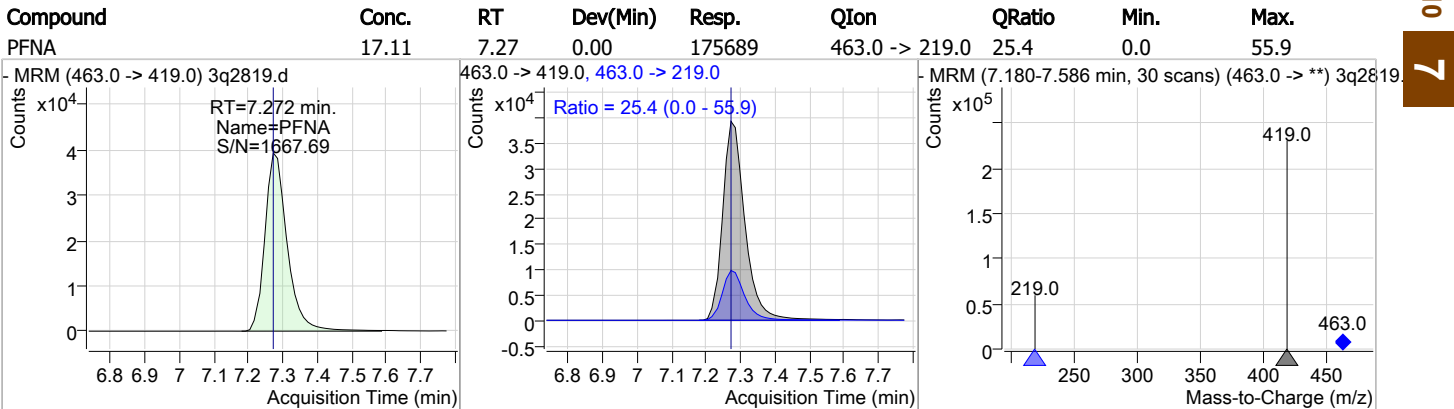
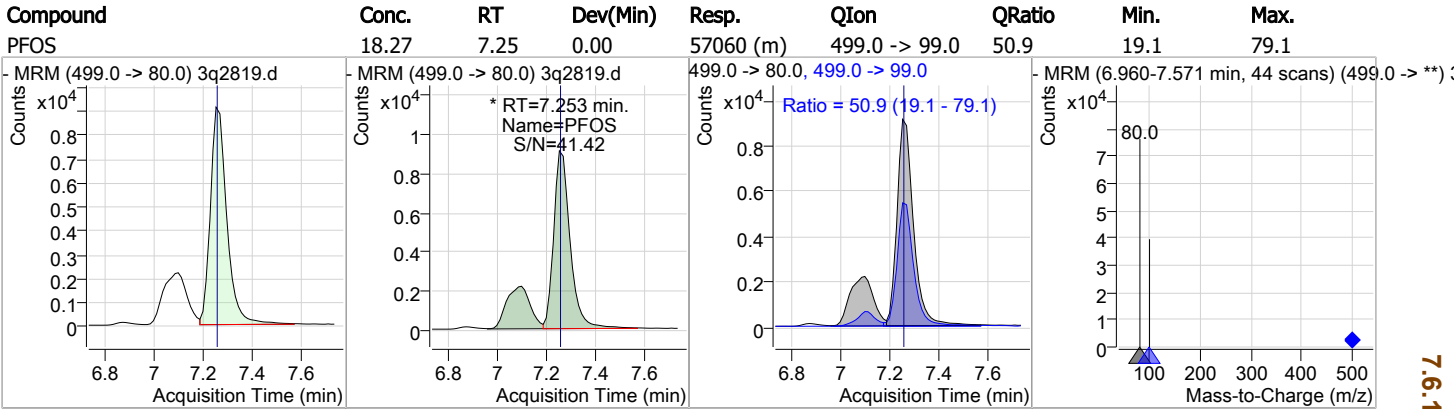
7.6.10 7



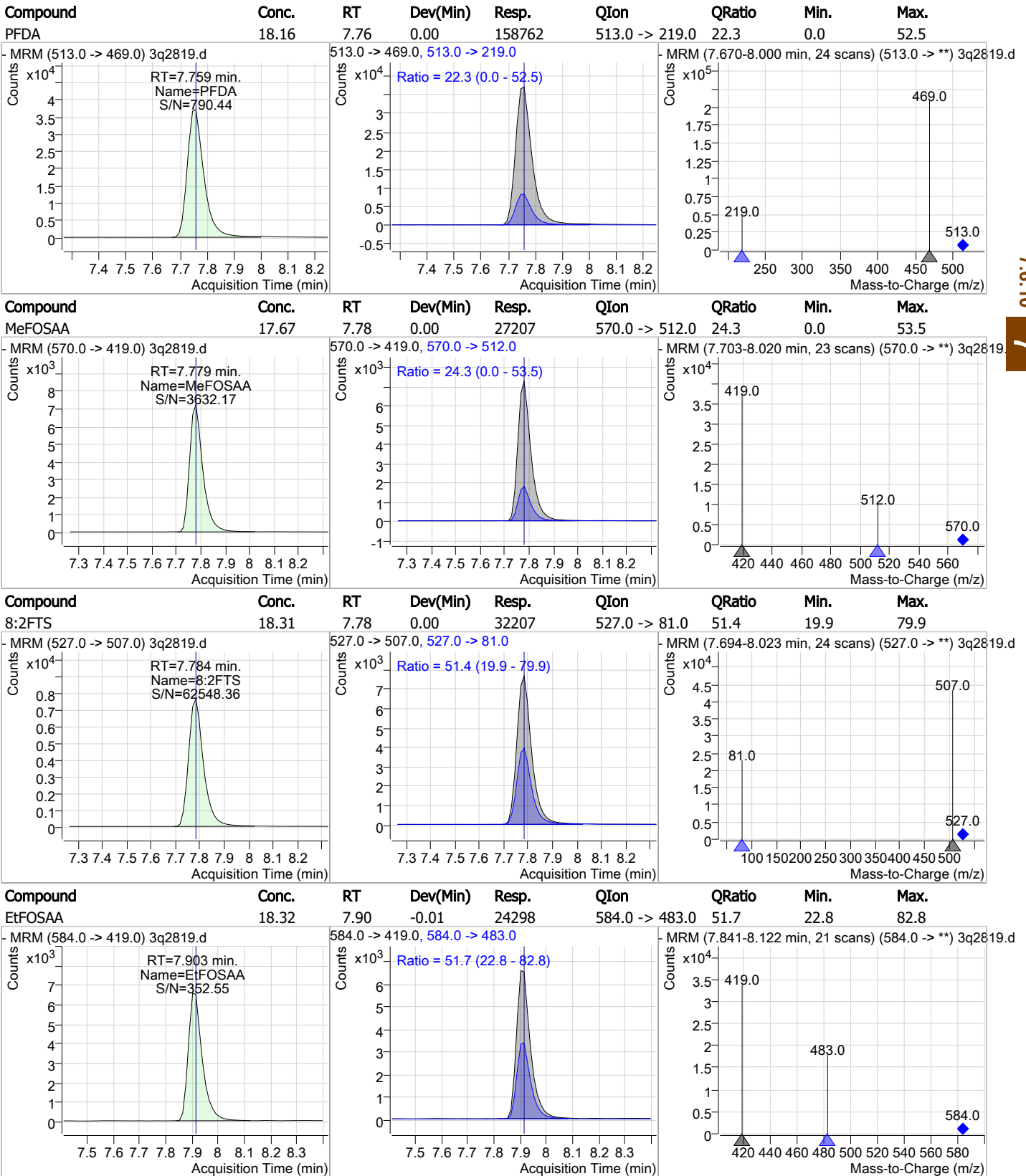
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS

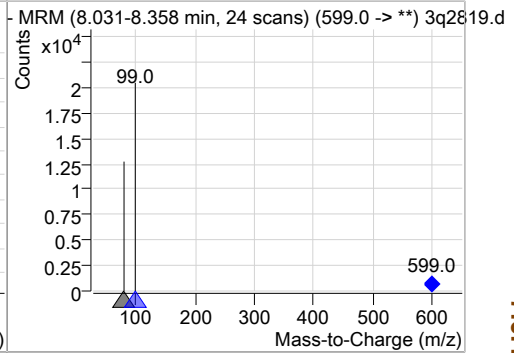
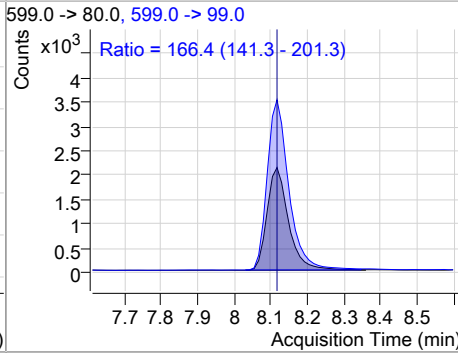
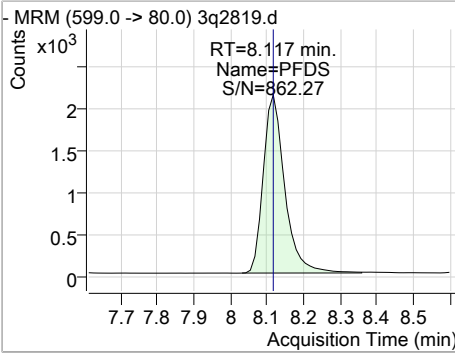


7.6-10 7

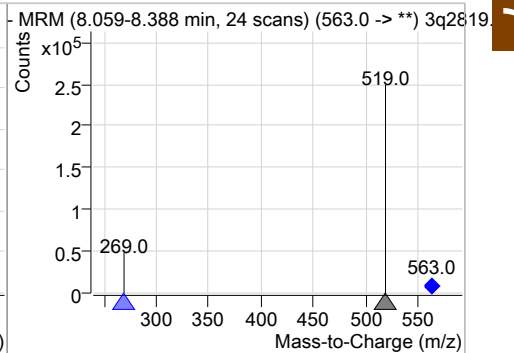
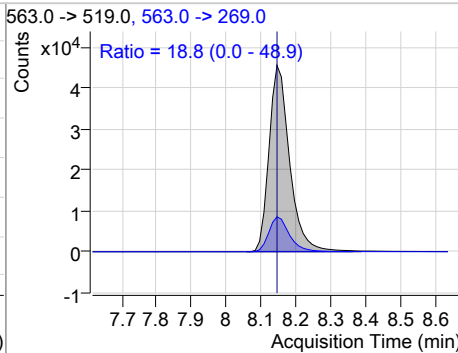
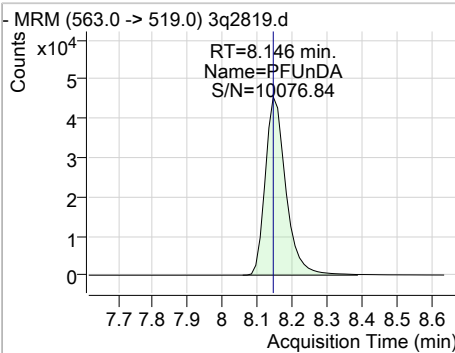


Perfluorinated Compounds by LC/MS/MS

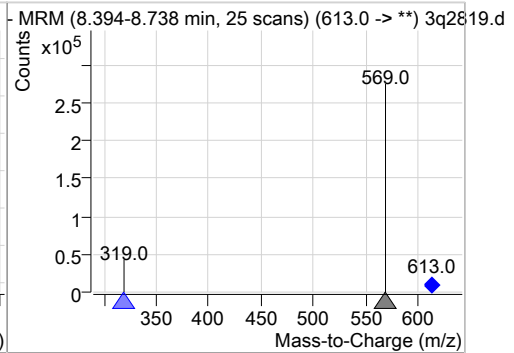
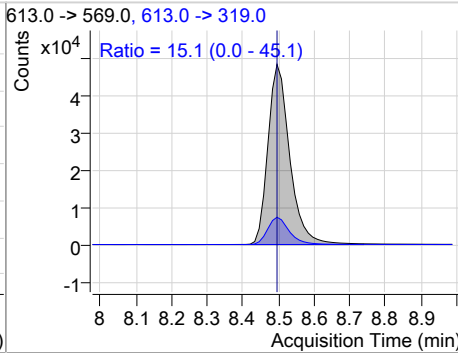
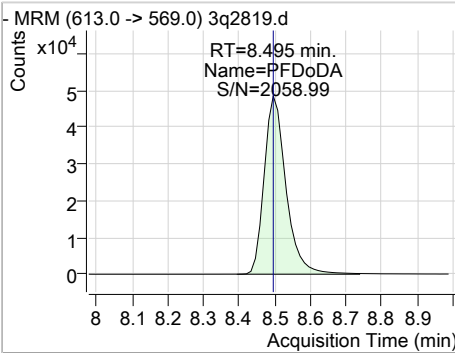
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	17.38	8.12	0.00	8596	599.0 -> 99.0	166.4	141.3	201.3



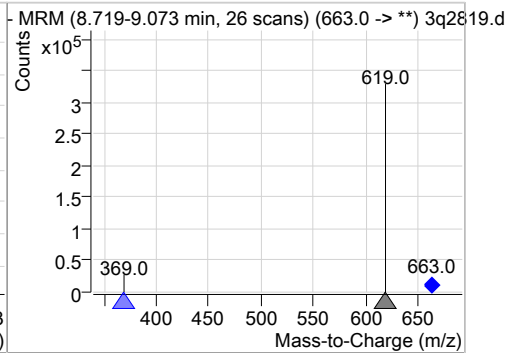
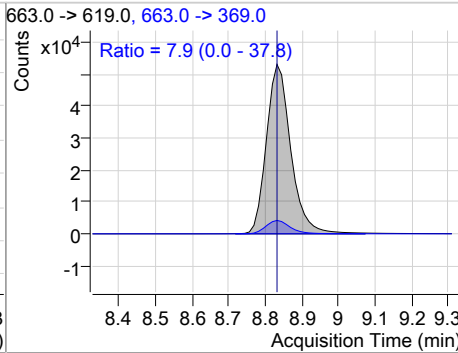
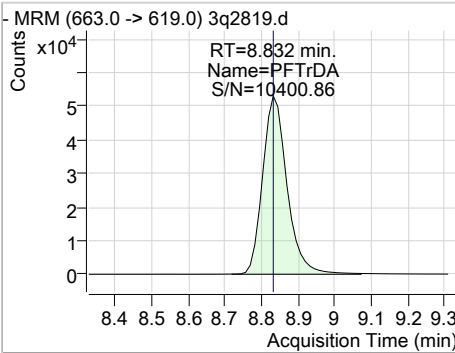
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	19.54	8.15	0.00	186520	563.0 -> 269.0	18.8	0.0	48.9



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	19.09	8.50	0.00	205728	613.0 -> 319.0	15.1	0.0	45.1



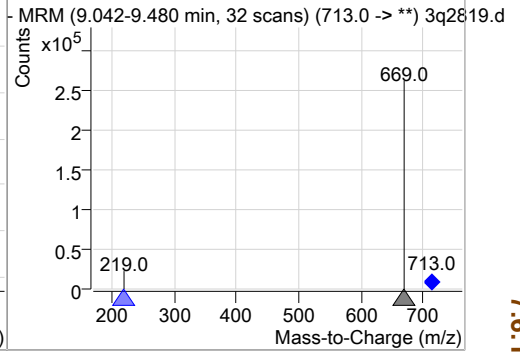
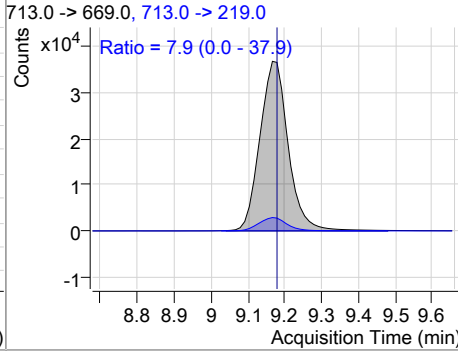
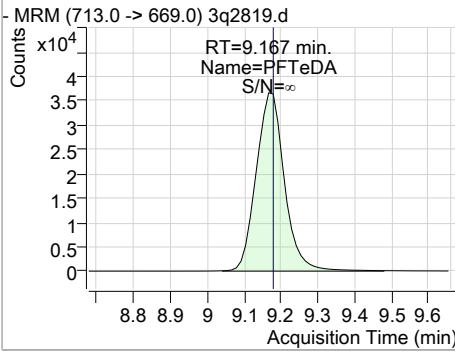
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	19.63	8.83	0.00	246005	663.0 -> 369.0	7.9	0.0	37.8



7.6.10 7

Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	16.37	9.17	-0.01	195340	713.0 -> 219.0	7.9	0.0	37.9



7.6.10
7

Manual Integration Approval Summary

Sample Number: S3Q72-ICV72 **Method:** EPA 537 MOD
Lab FileID: 3Q2819.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 17:20 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.10.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2820.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/11/2019 5:35:23 PM
 Sample Name : icv72-20
 Vial : P1-B3
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	51732	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	249073	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	224901	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	154094	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	56065	20.00 µg/L	0.000
d3-MeFOSAA	7.765	573.0 -> 419.0	27533	20.00 µg/L	-0.013

System Monitoring Compounds

13C2-PFDA	-	515.0 -> 470.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C2-PFHxA	-	315.0 -> 270.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
d5-EtFOSAA	-	589.0 -> 419.0	-	N.D.	
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = NA%	
13C3-HFPO-DA	-	287.0 -> 169.0	-	N.D.	
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = NA%	

Target Compounds

Compound	RT	QIon	Resp.	Conc. Units	QValue
4:2FTS	-	327.0 -> 307.0	-	N.D.	
6:2FTS	-	427.0 -> 407.0	-	N.D.	
8:2FTS	-	527.0 -> 507.0	-	N.D.	
EtFOSAA	7.903	584.0 -> 419.0	22694	17.68 µg/L m	96
FOSA	-	498.0 -> 78.0	-	N.D.	
MeFOSAA	7.779	570.0 -> 419.0	25352	17.00 µg/L m	95
PFBA	-	213.0 -> 169.0	-	N.D.	
PFBS	3.928	299.0 -> 80.0	56654	19.04 µg/L	100
PFDA	7.747	513.0 -> 469.0	182099	20.90 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	209807	19.23 µg/L	100
PFDS	-	599.0 -> 80.0	-	N.D.	
PFHpA	5.962	363.0 -> 319.0	282329	18.44 µg/L	99
PFHpS	-	449.0 -> 80.0	-	N.D.	
PFHxA	5.012	313.0 -> 269.0	98258	18.65 µg/L	99
PFHxS	5.995	399.0 -> 80.0	47100	19.46 µg/L m	100
PFNA	7.272	463.0 -> 419.0	206320	20.16 µg/L	100
PFNS	-	549.0 -> 80.0	-	N.D.	
PFOA	6.681	413.0 -> 369.0	179860	19.81 µg/L	100
PFOS	7.253	499.0 -> 80.0	58125	18.91 µg/L m	100
PFPeA	-	263.0 -> 219.0	-	N.D.	
PFPeS	-	349.0 -> 80.0	-	N.D.	
PFTeDA	9.167	713.0 -> 669.0	247571	20.50 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	258822	20.40 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	197723	20.47 µg/L	100
ADONA	6.061	377.0 -> 251.0	387527	19.18 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	37310	19.24 µg/L	100
11Cl-PF3OUdS	8.277	631.0 -> 451.0	158397	19.80 µg/L	100
HFPO-DA	5.321	329.0 -> 169.0	48649	20.59 µg/L	99

7.6.11
7



Perfluorinated Compounds by LC/MS/MS

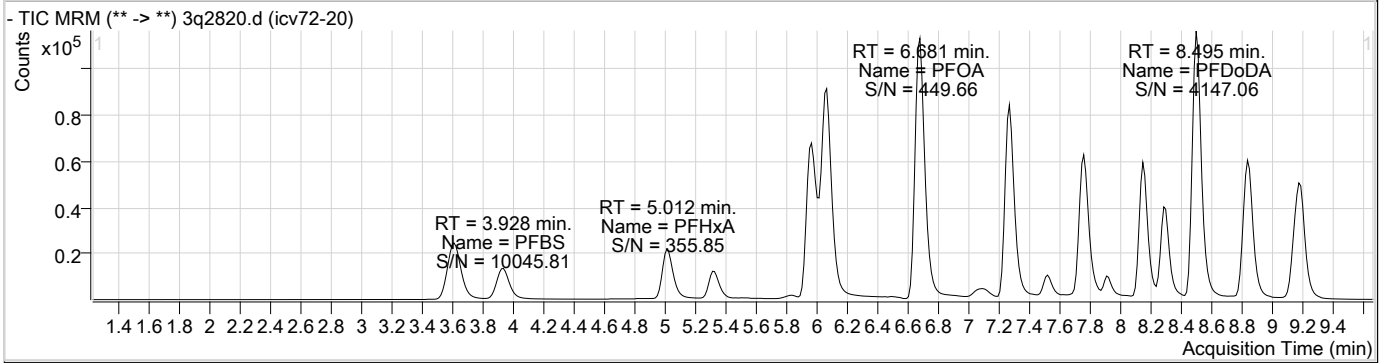
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

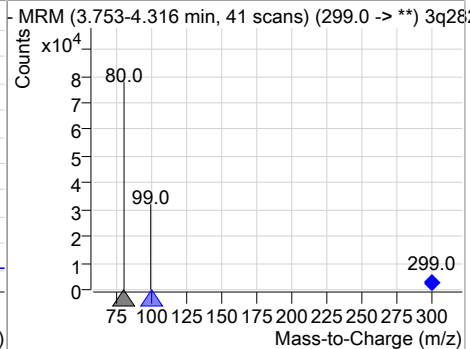
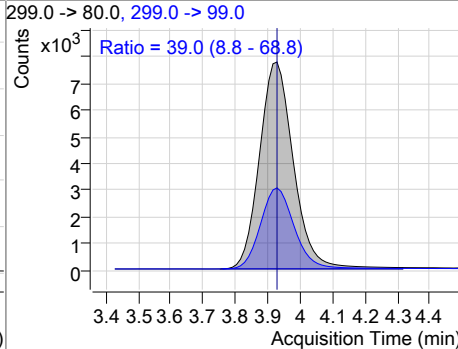
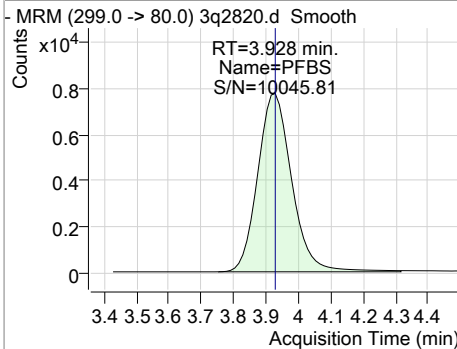
7.6.11

7

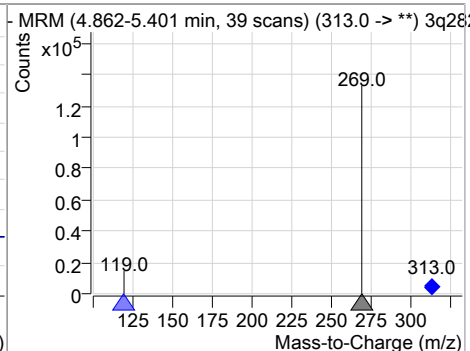
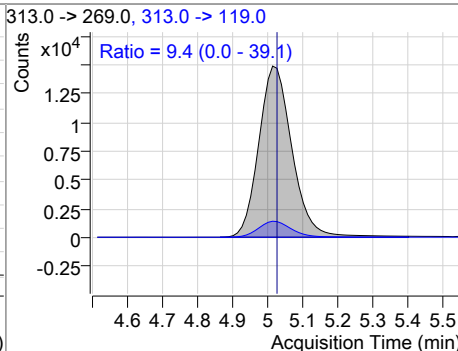
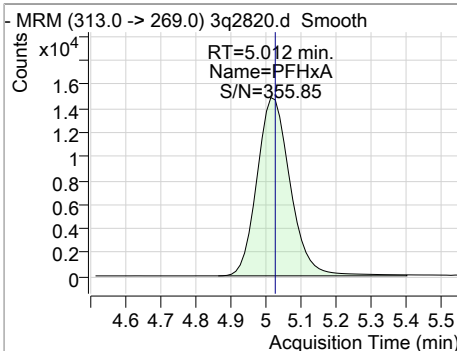
Perfluorinated Compounds by LC/MS/MS



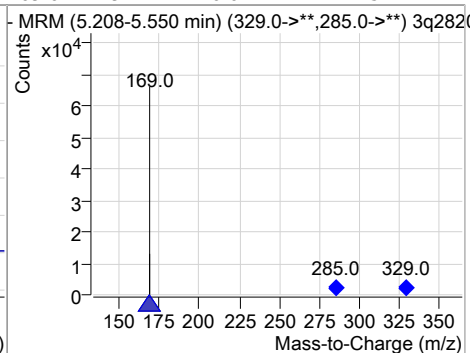
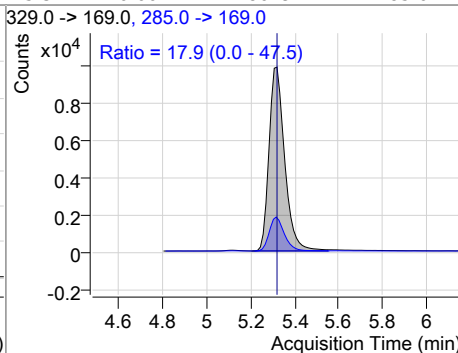
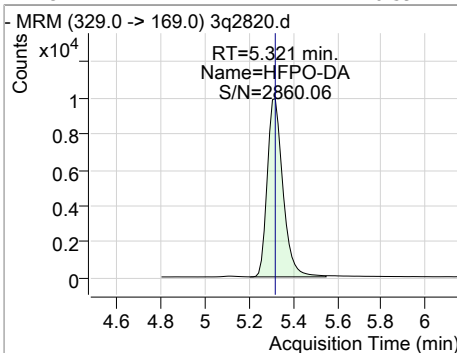
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	19.04	3.93	0.00	56654	299.0 -> 99.0	39.0	8.8	68.8



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	18.65	5.01	-0.01	98258	313.0 -> 119.0	9.4	0.0	39.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	20.59	5.32	0.00	48649	285.0 -> 169.0	17.9	0.0	47.5

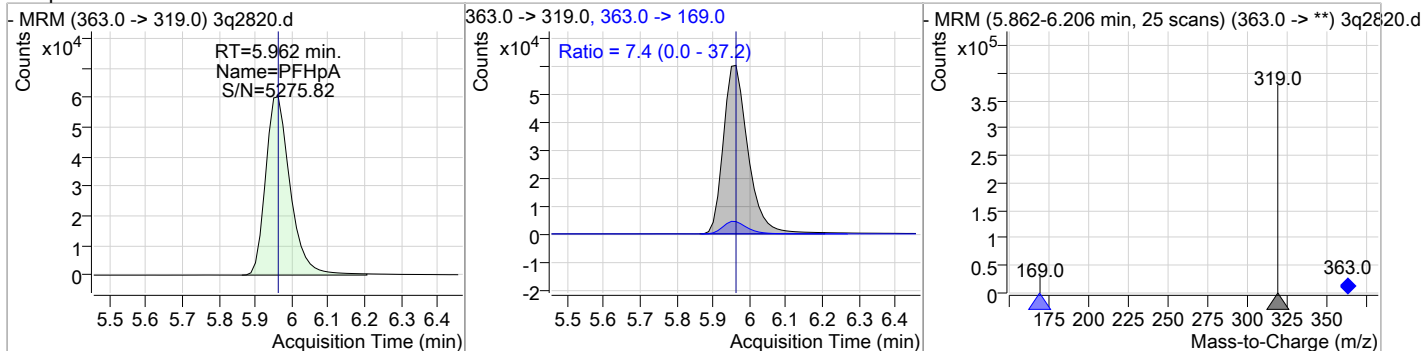


7.6.11
7

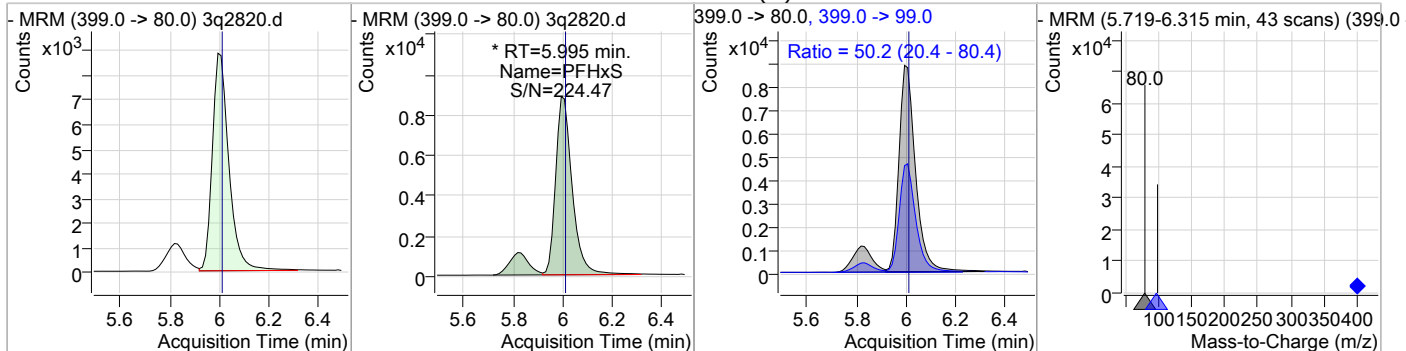


Perfluorinated Compounds by LC/MS/MS

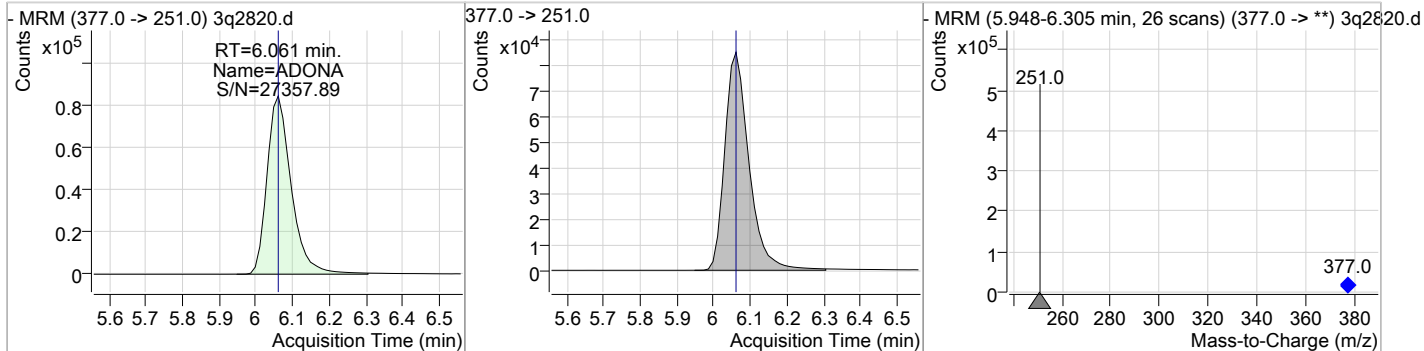
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	18.44	5.96	0.00	282329	363.0 -> 169.0	7.4	0.0	37.2



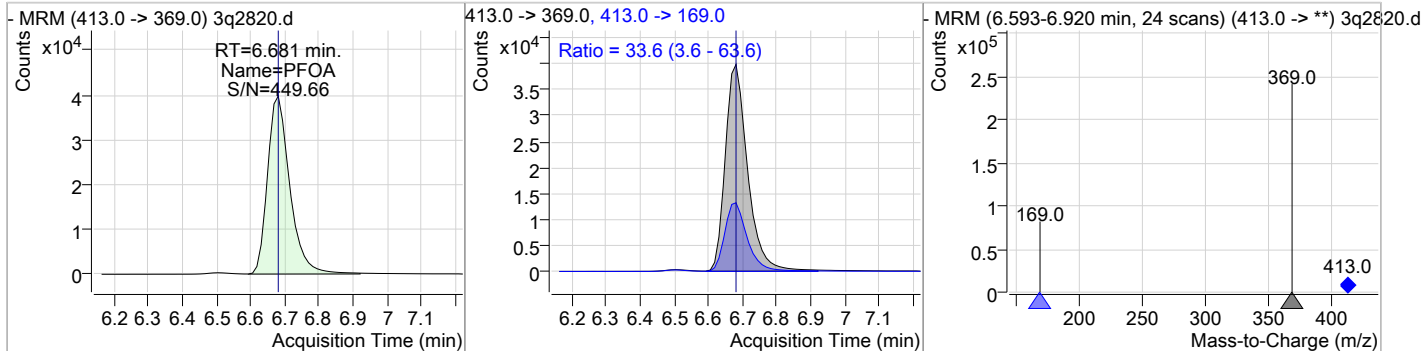
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	19.46	5.99	-0.01	47100 (m)	399.0 -> 99.0	50.2	20.4	80.4



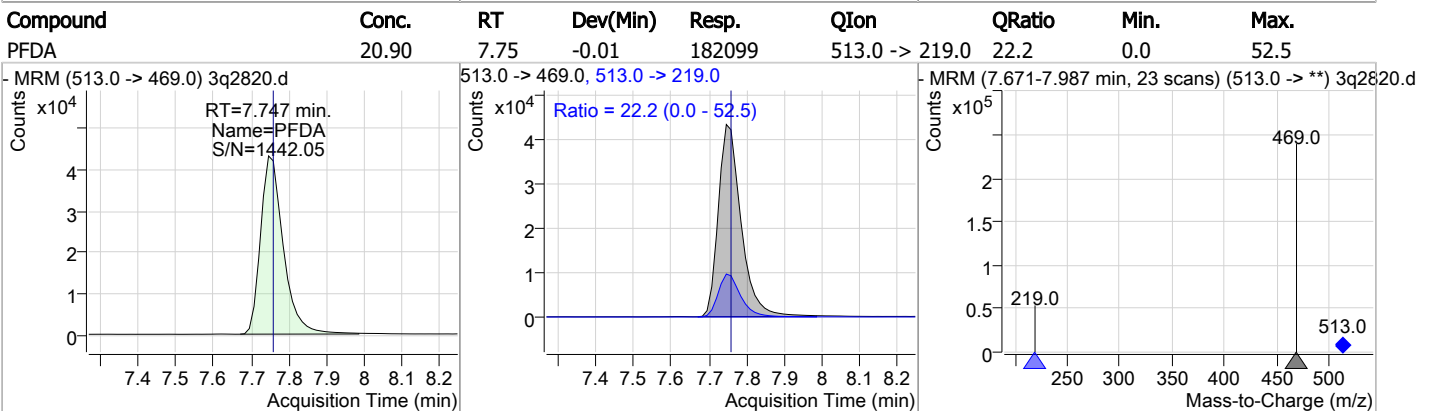
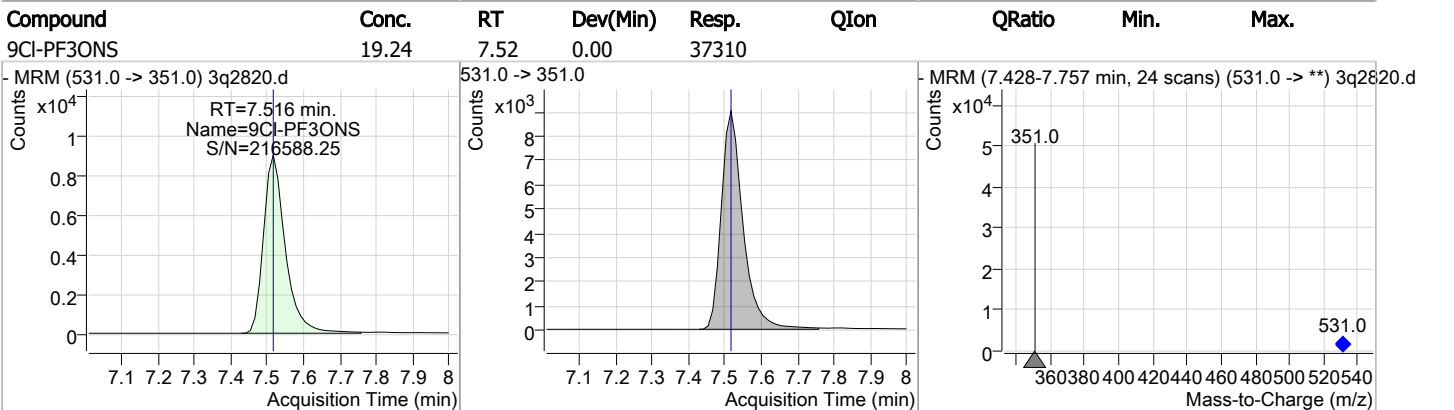
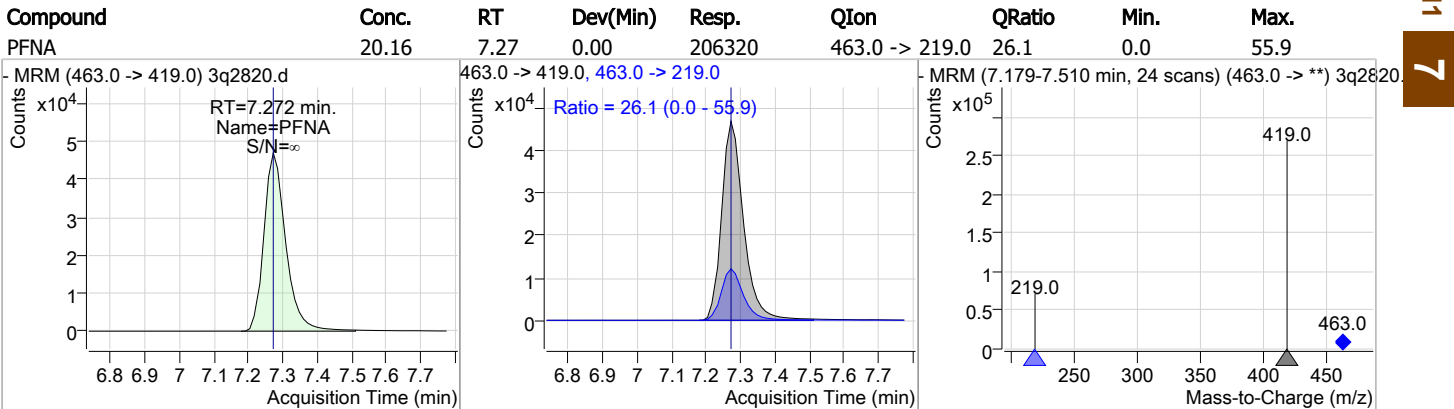
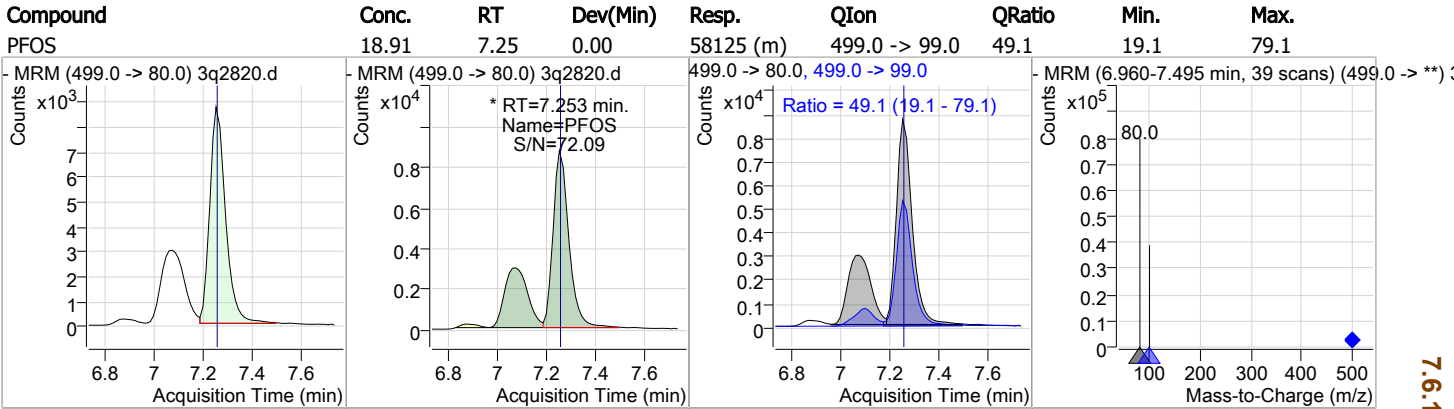
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
ADONA	19.18	6.06	0.00	387527	377.0 -> 251.0			



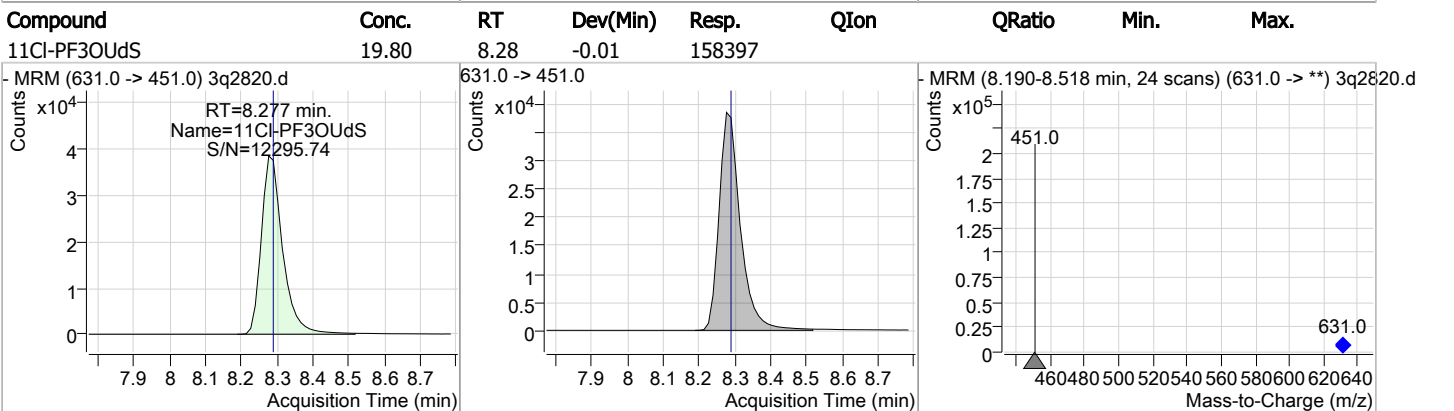
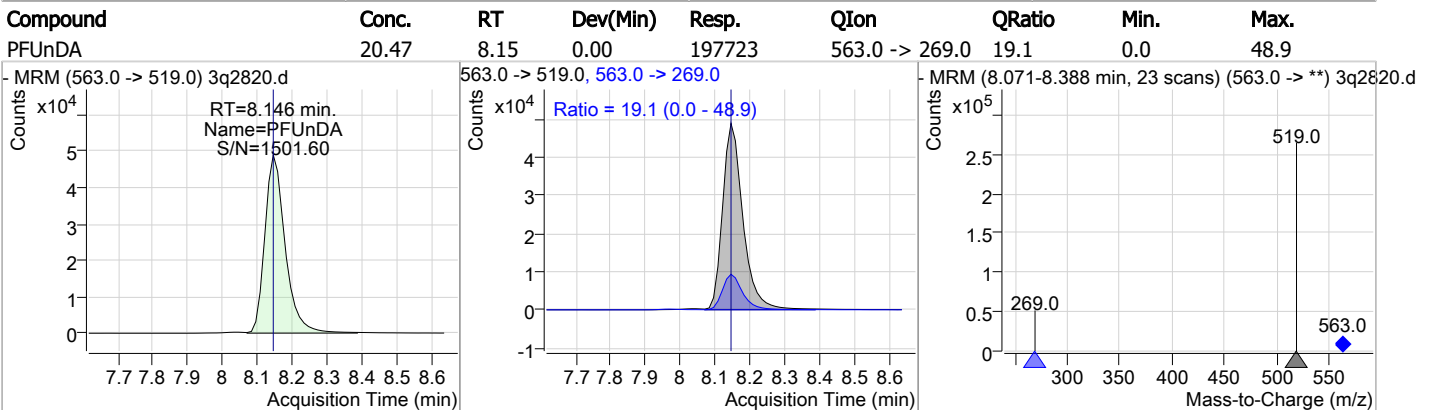
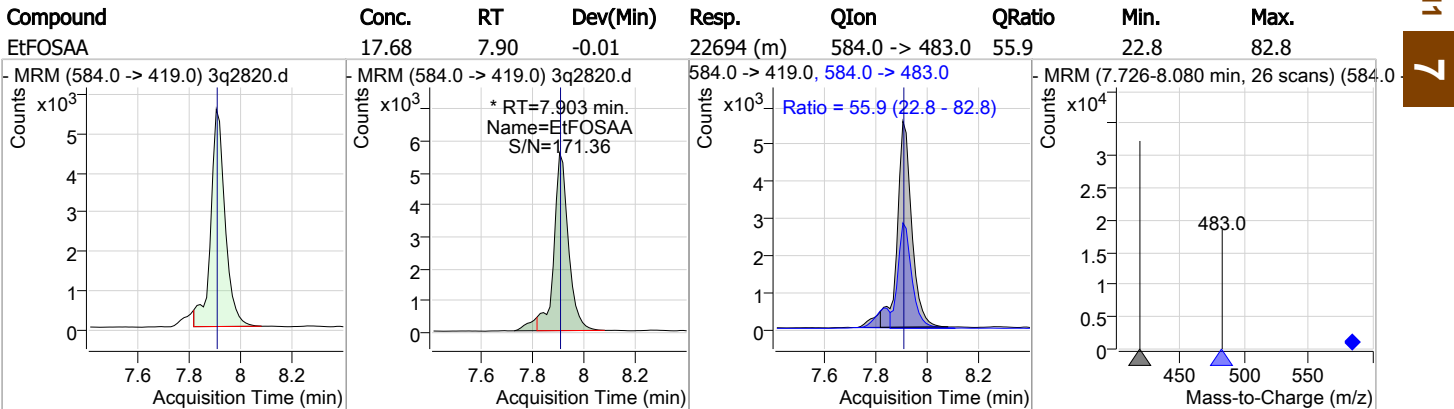
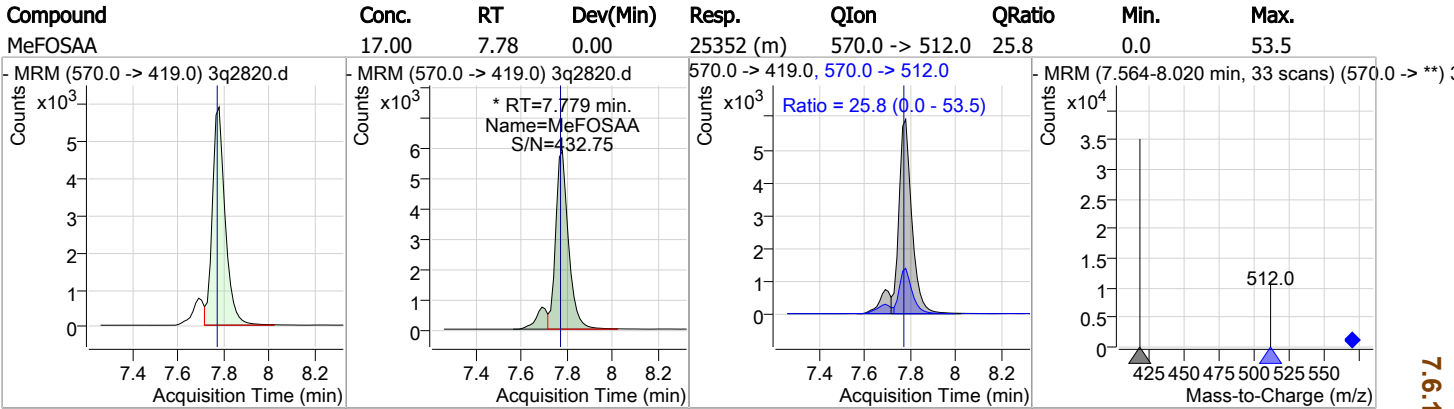
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOA	19.81	6.68	0.00	179860	413.0 -> 169.0	33.6	3.6	63.6



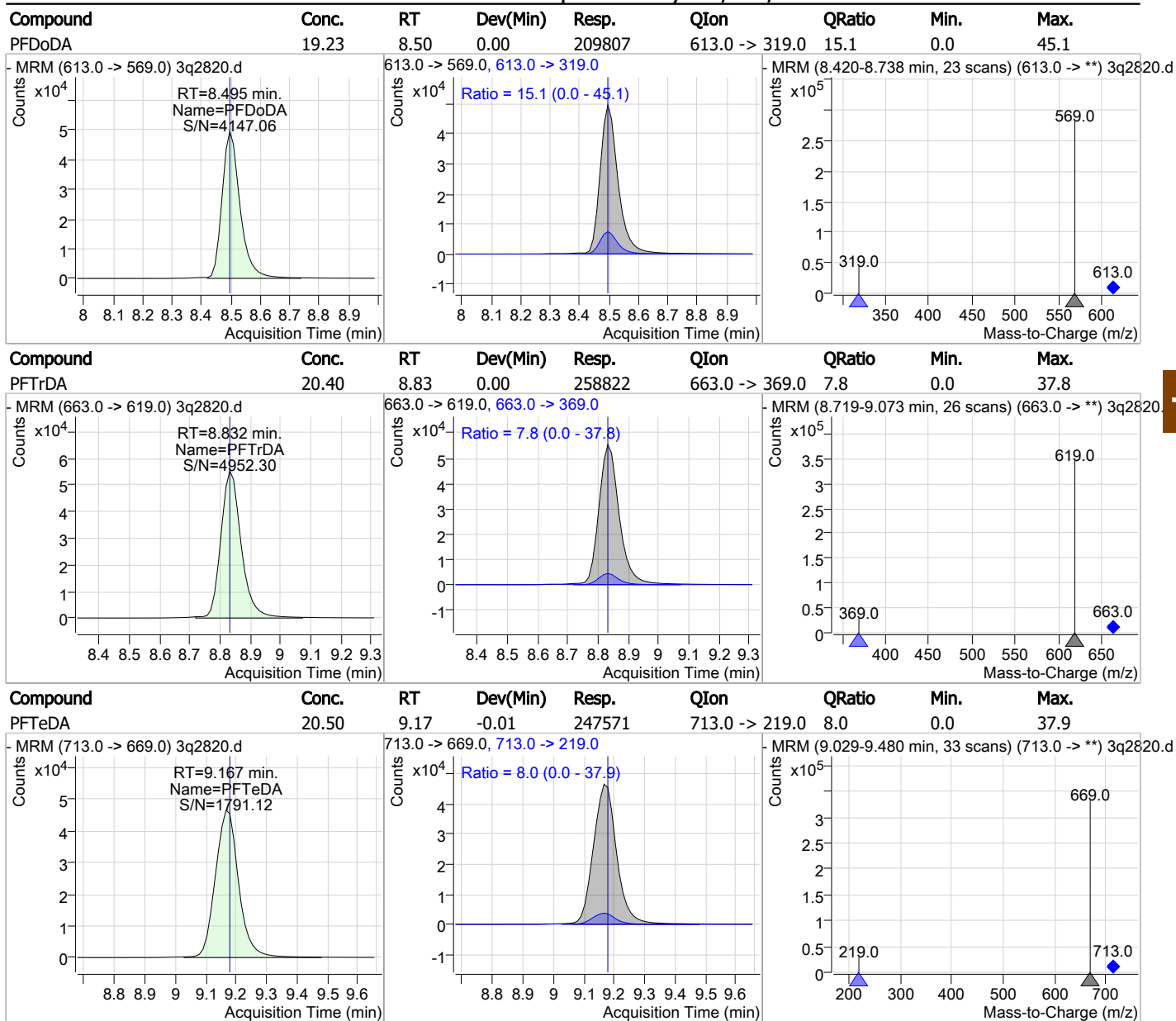
Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



Perfluorinated Compounds by LC/MS/MS



7.6.11
7



Manual Integration Approval Summary

Sample Number: S3Q72-ICV72 **Method:** EPA 537 MOD
Lab FileID: 3Q2820.D **Analyst approved:** 04/12/19 12:05 Nancy Saunders
Injection Time: 04/11/19 17:35 **Supervisor approved:** 04/12/19 17:21 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.00	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak
MeFOSAA	2355-31-9		7.78	Split peak
EtFOSAA	2991-50-6		7.90	Split peak

7.6.11.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2896.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 1:04:34 PM
 Sample Name : cc72-20
 Vial : P1-A7
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.662	429.0 -> 409.0	57200	20.00 µg/L	0.000
13C2-PFDoDA	8.494	615.0 -> 570.0	264954	20.00 µg/L	0.000
13C2-PFOA	6.679	415.0 -> 370.0	235284	20.00 µg/L	0.000
13C3-PFPeA	3.609	266.0 -> 222.0	160816	20.00 µg/L	-0.013
13C4-PFOS	7.252	503.0 -> 80.0	59450	20.00 µg/L	0.000
d3-MeFOSAA	7.779	573.0 -> 419.0	29624	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	236951	20.04 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.2%	
13C2-PFHxA	5.011	315.0 -> 270.0	201484	18.81 µg/L	-0.013
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 94.0%	
d5-EtFOSAA	7.903	589.0 -> 419.0	31671	18.43 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 92.1%	
13C3-HFPO-DA	5.316	287.0 -> 169.0	72298	100.16 µg/L	0.000
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 100.2%	
Target Compounds					
4:2FTS	4.908	327.0 -> 307.0	58645	18.93 µg/L	QValue
6:2FTS	6.663	427.0 -> 407.0	52438	19.10 µg/L	100
8:2FTS	7.784	527.0 -> 507.0	37330	19.88 µg/L	99
EtFOSAA	7.916	584.0 -> 419.0	26997	19.50 µg/L	98
FOSA	7.333	498.0 -> 78.0	93537	18.91 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	28729	17.90 µg/L	100
PFBA	1.726	213.0 -> 169.0	54427	17.11 µg/L	100
PFBS	3.928	299.0 -> 80.0	57211	18.14 µg/L	100
PFDA	7.759	513.0 -> 469.0	185454	20.34 µg/L	100
PFDoDA	8.495	613.0 -> 569.0	216293	18.64 µg/L	100
PFDS	8.117	599.0 -> 80.0	9998	19.37 µg/L	95
PFHpA	5.962	363.0 -> 319.0	287783	17.97 µg/L	100
PFHpS	6.684	449.0 -> 80.0	43293	18.62 µg/L	99
PFHxA	5.012	313.0 -> 269.0	98541	17.87 µg/L	99
PFHxS	6.007	399.0 -> 80.0	46697	18.20 µg/L	m 100
PFNA	7.272	463.0 -> 419.0	201604	18.83 µg/L	100
PFNS	7.730	549.0 -> 80.0	39671	19.42 µg/L	97
PFOA	6.681	413.0 -> 369.0	177757	18.71 µg/L	100
PFOS	7.253	499.0 -> 80.0	60850	18.67 µg/L	m 97
PFPeA	3.612	263.0 -> 219.0	194328	18.76 µg/L	100
PFPeS	5.143	349.0 -> 80.0	36863	19.18 µg/L	100
PFTeDA	9.167	713.0 -> 669.0	251120	19.55 µg/L	100
PFTrDA	8.832	663.0 -> 619.0	264799	19.62 µg/L	100
PFUnDA	8.146	563.0 -> 519.0	199516	19.42 µg/L	99
ADONA	6.061	377.0 -> 251.0	379865	17.97 µg/L	100
9Cl-PF3ONS	7.516	531.0 -> 351.0	35725	17.61 µg/L	100
11Cl-PF3OUds	8.277	631.0 -> 451.0	150904	18.03 µg/L	100
HFPO-DA	5.308	329.0 -> 169.0	240150	98.27 µg/L	100

7.6.12
7

Perfluorinated Compounds by LC/MS/MS

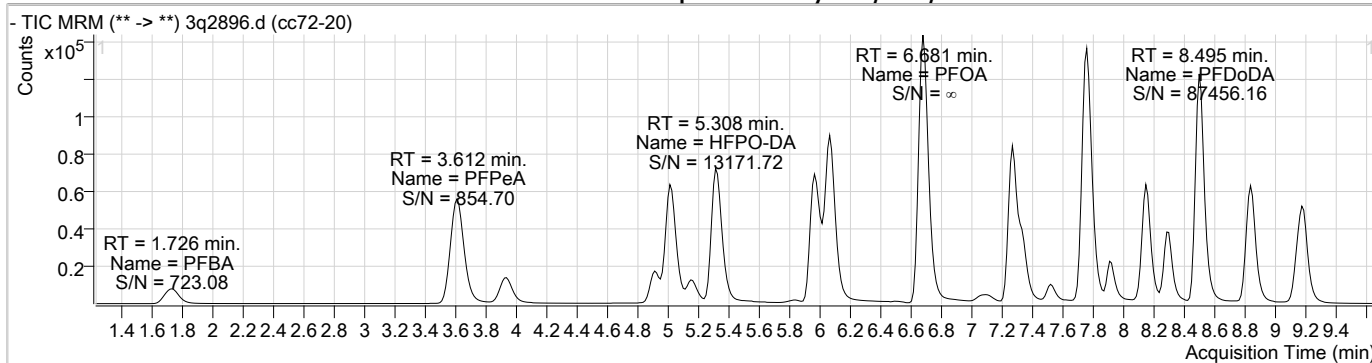
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

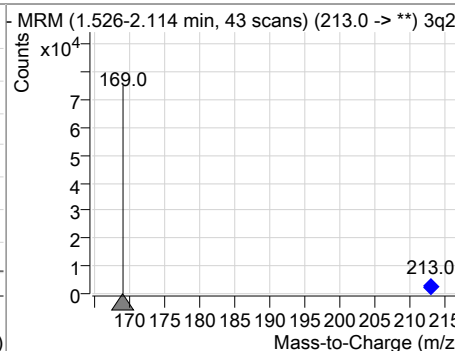
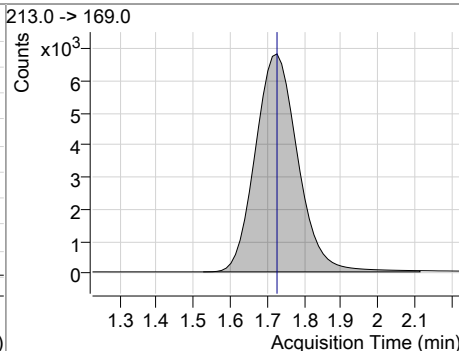
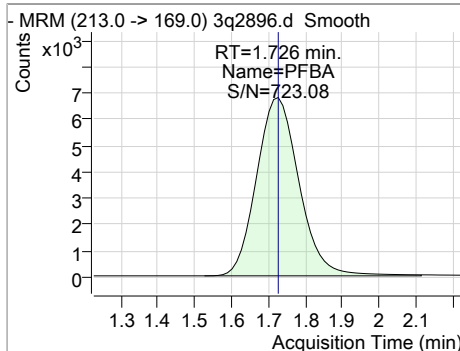
7.6.12

7

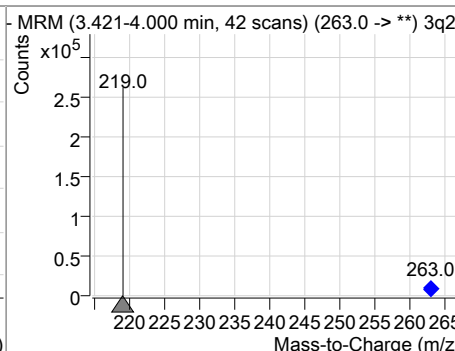
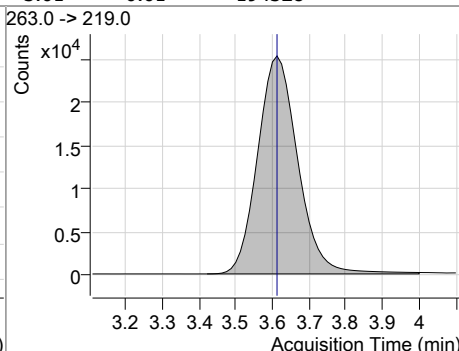
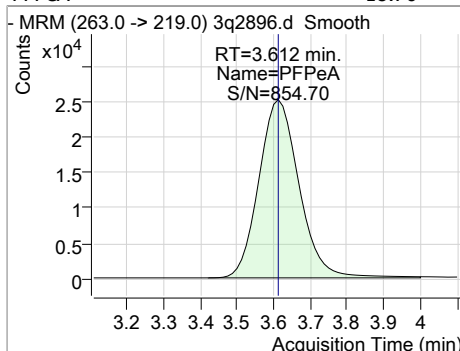
Perfluorinated Compounds by LC/MS/MS



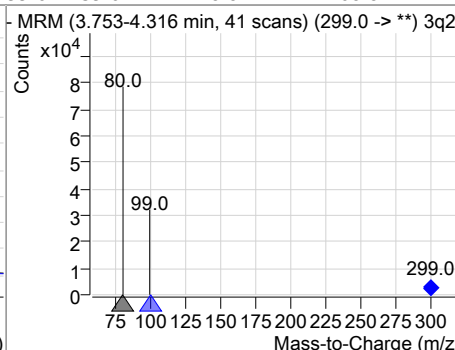
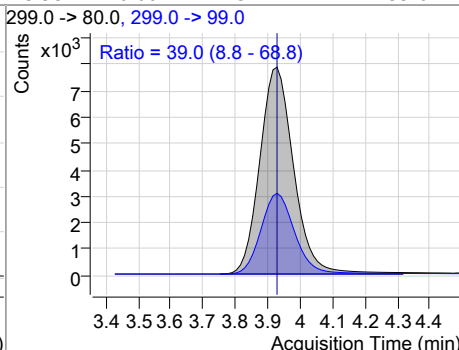
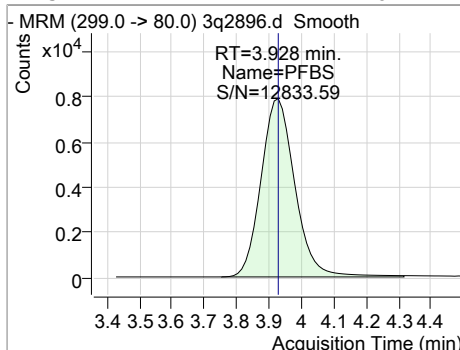
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	17.11	1.73	0.00	54427				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	18.76	3.61	-0.01	194328				

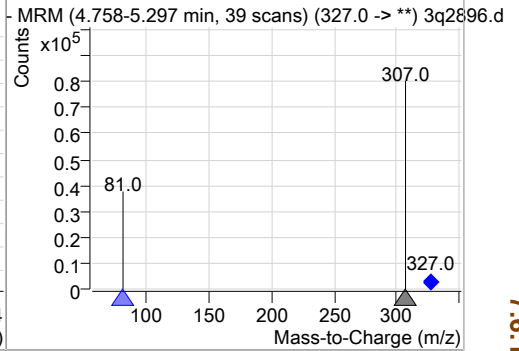
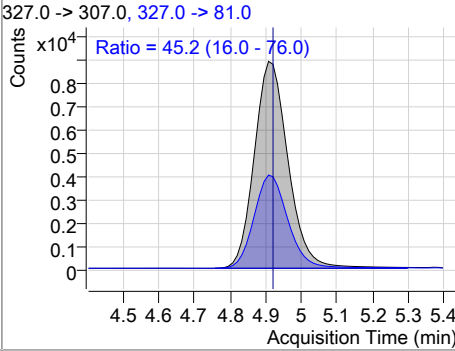
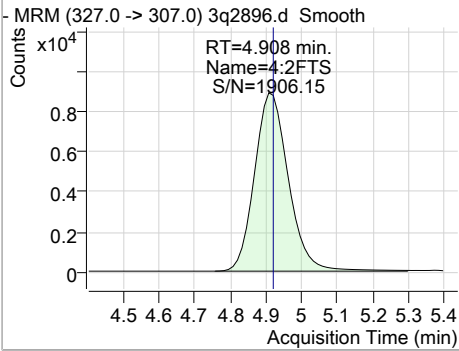


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	18.14	3.93	0.00	57211	299.0 -> 99.0	39.0	8.8	68.8

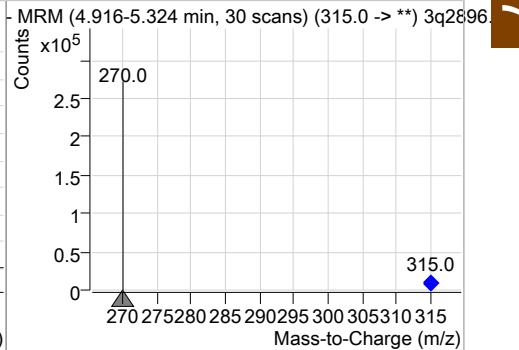
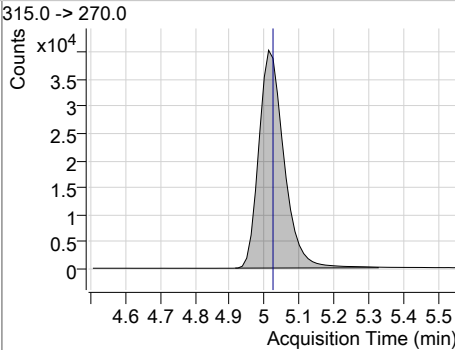
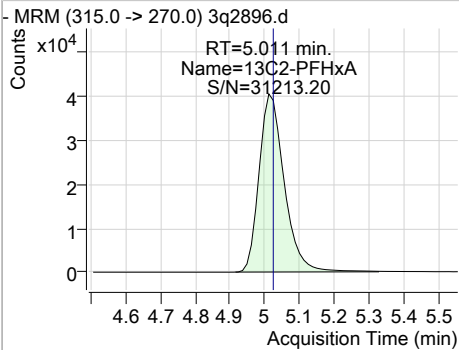


Perfluorinated Compounds by LC/MS/MS

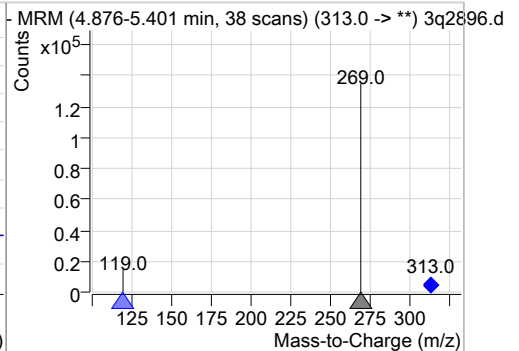
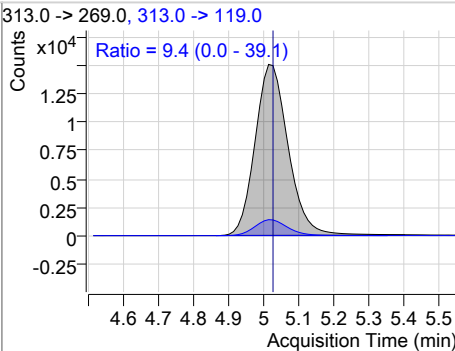
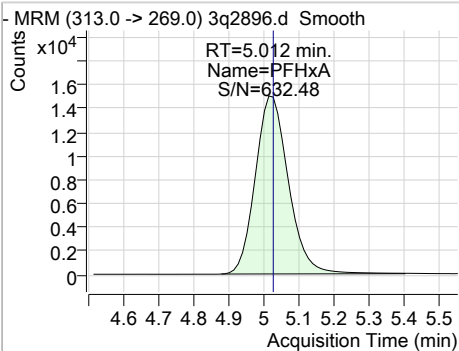
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
4:2FTS	18.93	4.91	-0.01	58645	327.0 -> 81.0	45.2	16.0	76.0



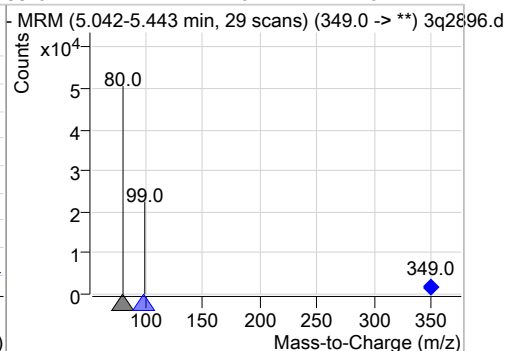
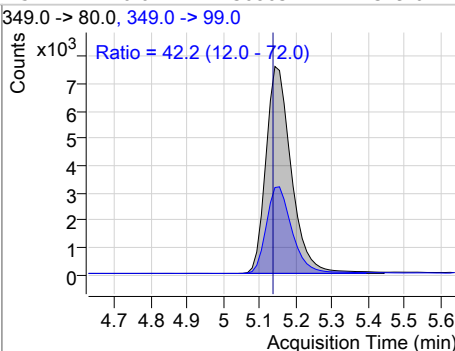
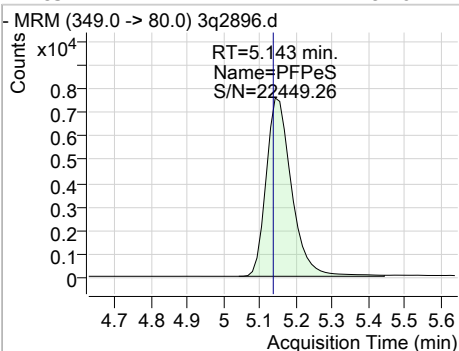
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFHxA	18.81	5.01	-0.01	201484				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxA	17.87	5.01	-0.01	98541	313.0 -> 119.0	9.4	0.0	39.1

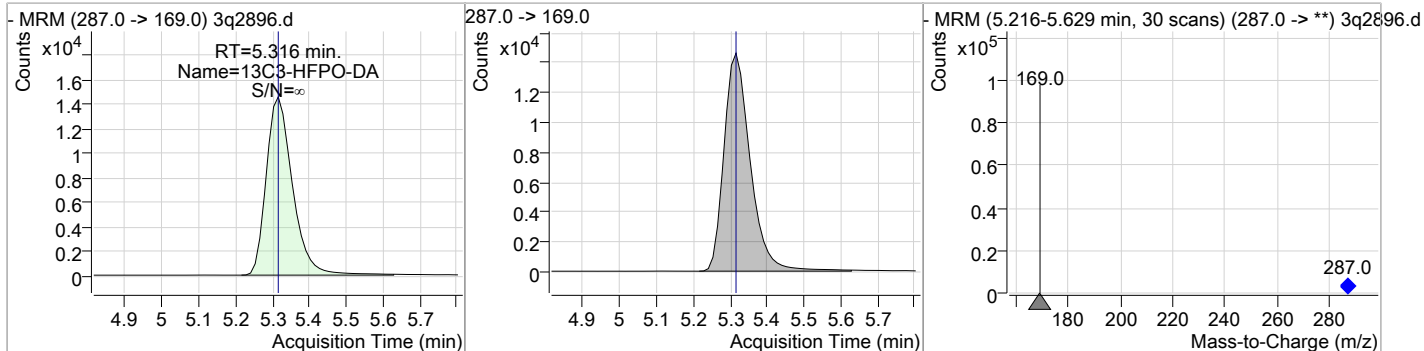


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeS	19.18	5.14	-0.01	36863	349.0 -> 99.0	42.2	12.0	72.0

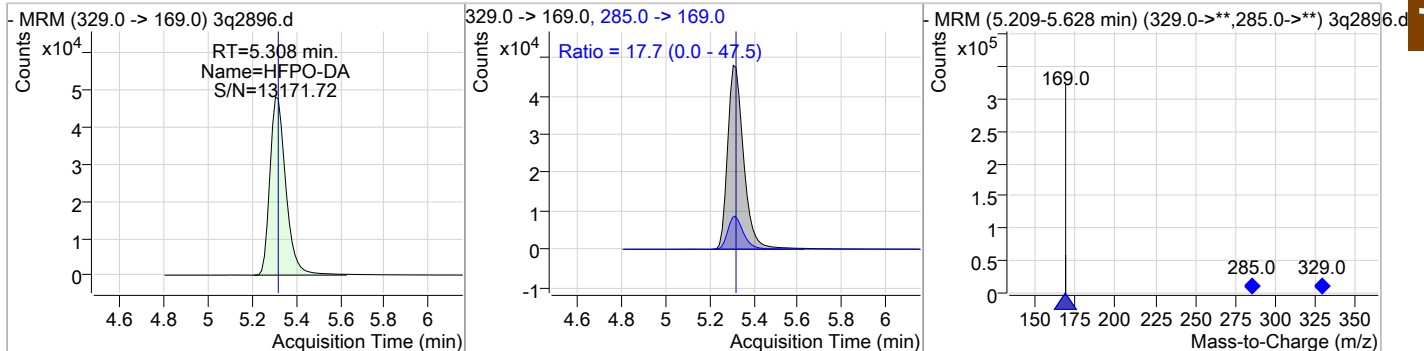


Perfluorinated Compounds by LC/MS/MS

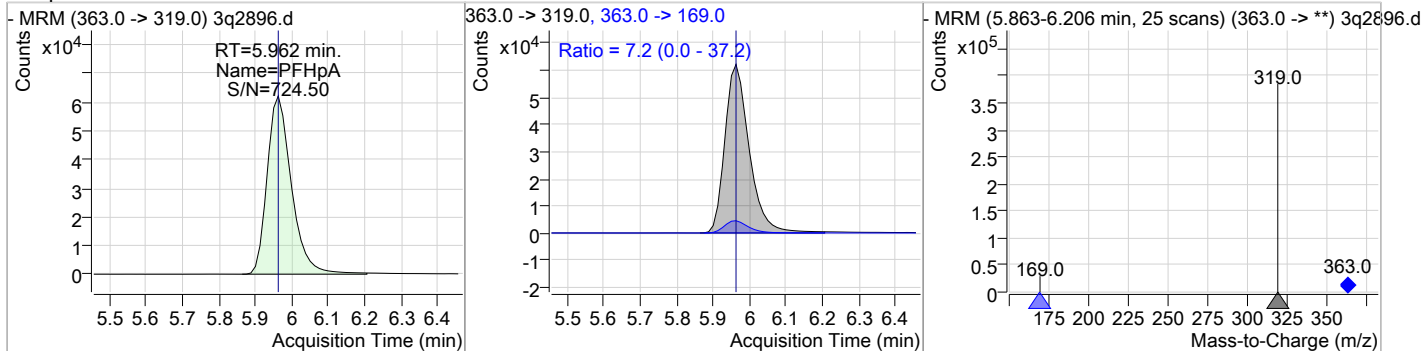
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	100.16	5.32	0.00	72298				



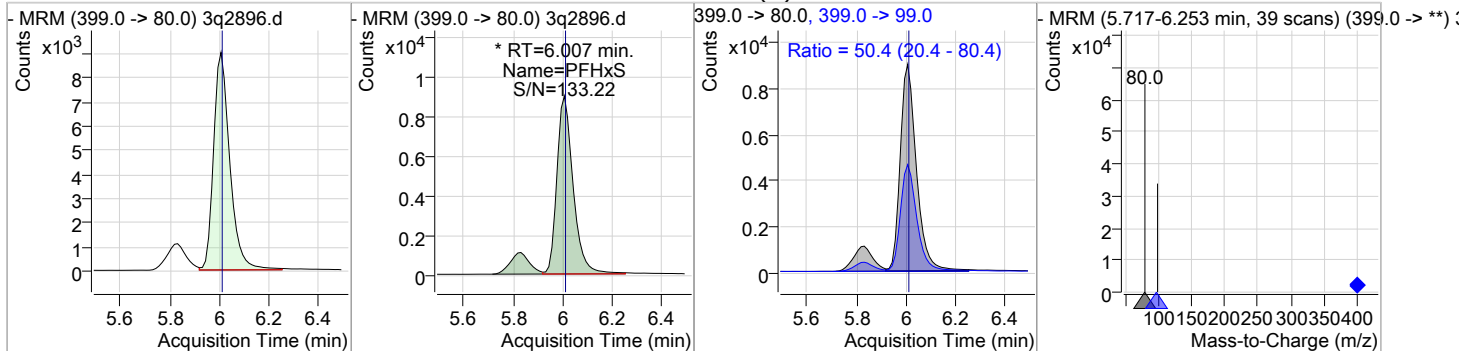
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	98.27	5.31	-0.01	240150	285.0 -> 169.0	17.7	0.0	47.5



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	17.97	5.96	0.00	287783	363.0 -> 169.0	7.2	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	18.20	6.01	0.00	46697 (m)	399.0 -> 99.0	50.4	20.4	80.4

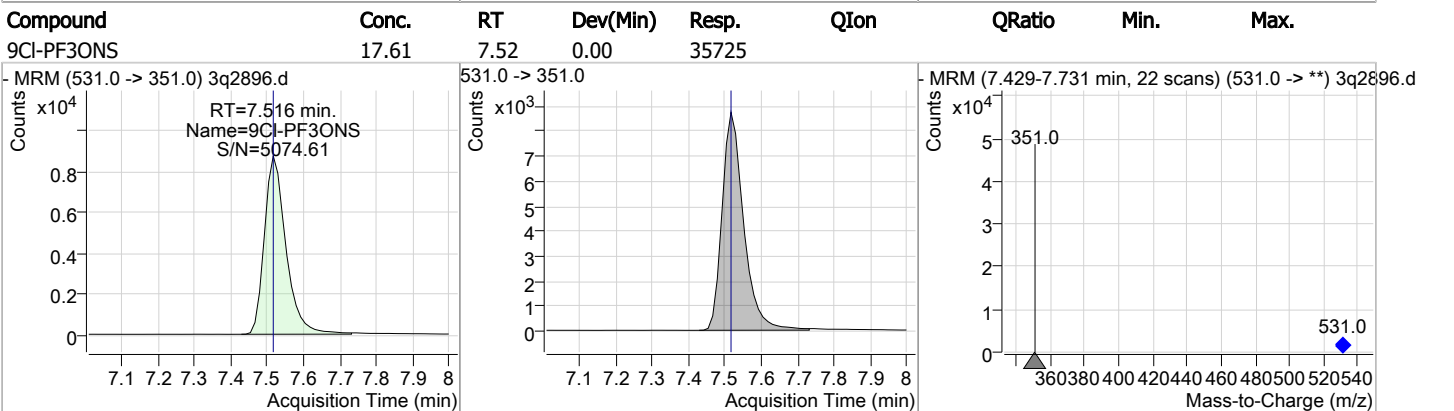
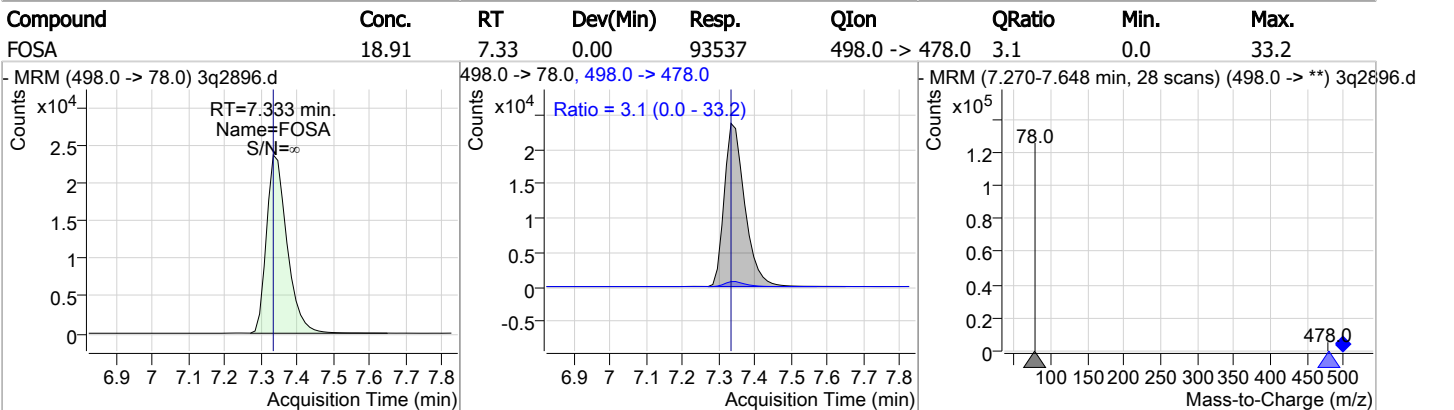
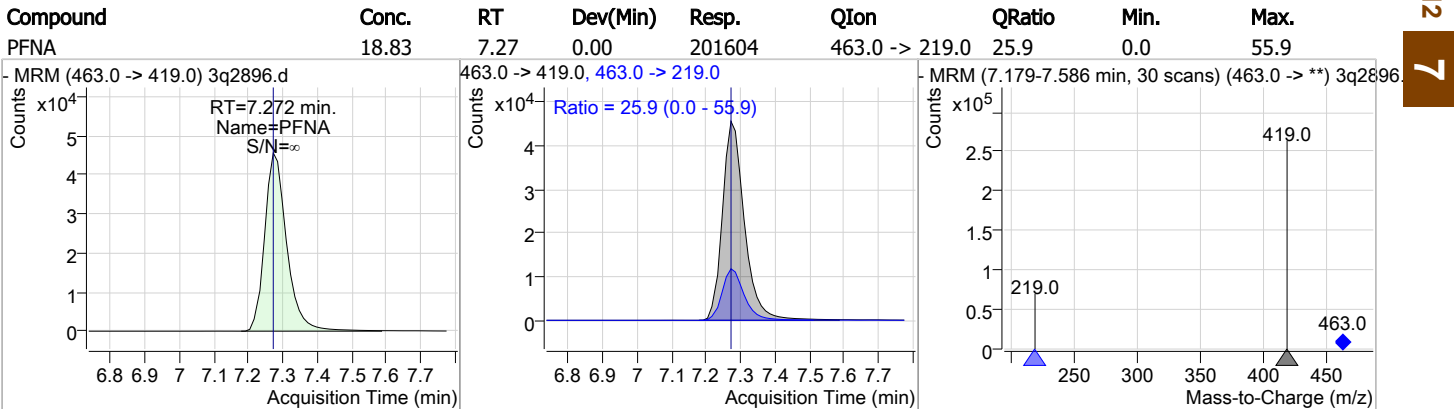
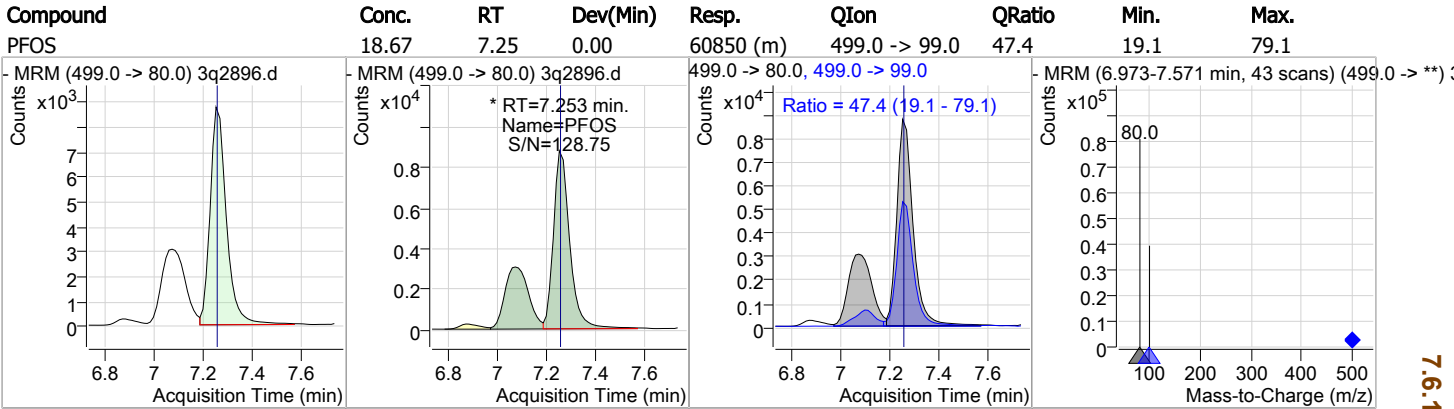


Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
ADONA	17.97	6.06	0.00	379865				
6:2FTS	19.10	6.66	0.00	52438	427.0 -> 81.0	45.2	15.1	75.1
PFOA	18.71	6.68	0.00	177757	413.0 -> 169.0	33.6	3.6	63.6
PFHpS	18.62	6.68	0.00	43293	449.0 -> 99.0	51.2	20.3	80.3

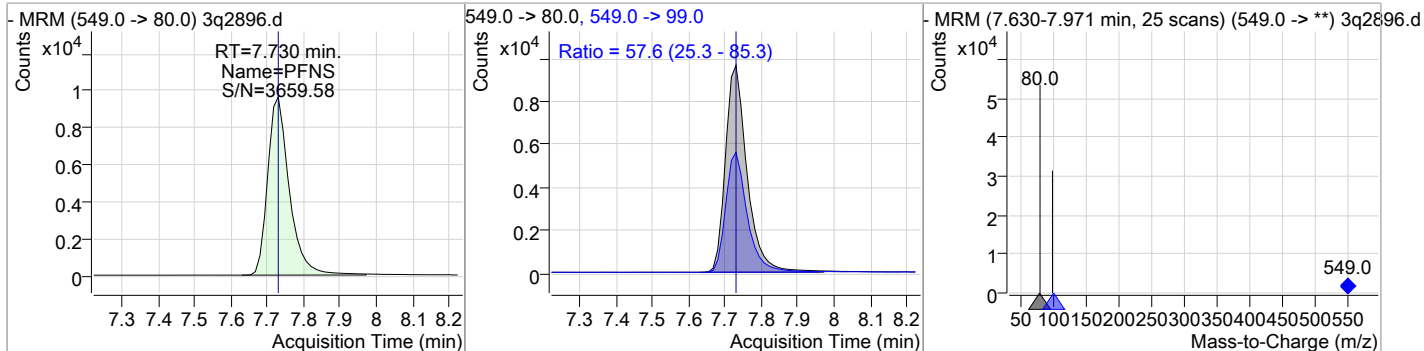
7.6.12 7

Perfluorinated Compounds by LC/MS/MS

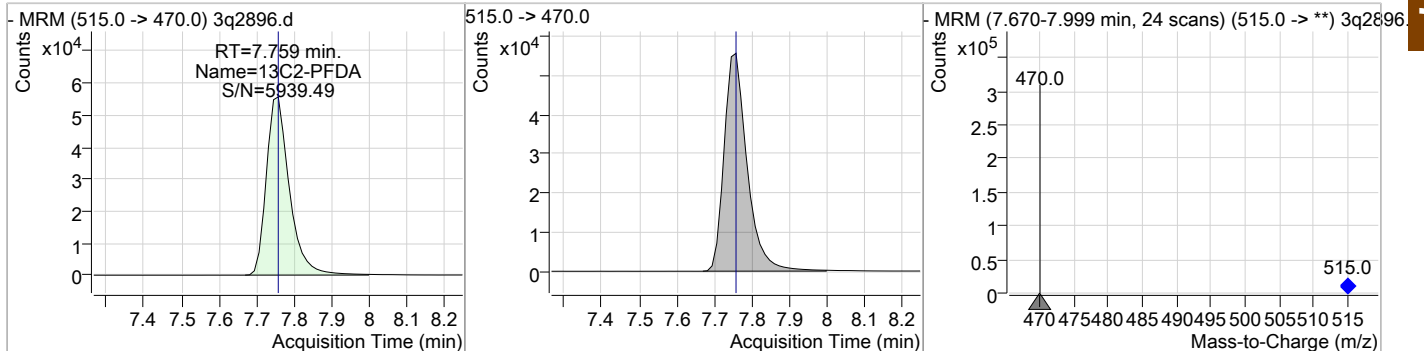


Perfluorinated Compounds by LC/MS/MS

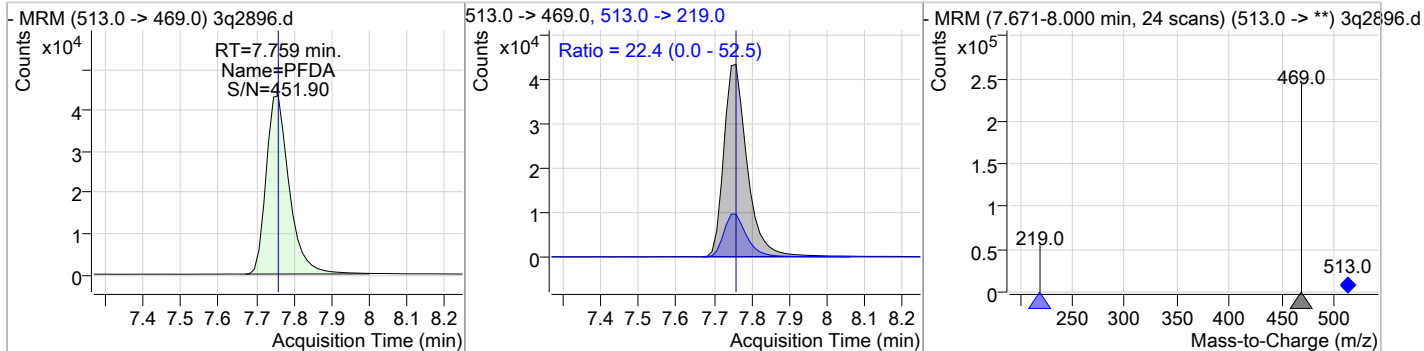
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	19.42	7.73	0.00	39671	549.0 -> 99.0	57.6	25.3	85.3



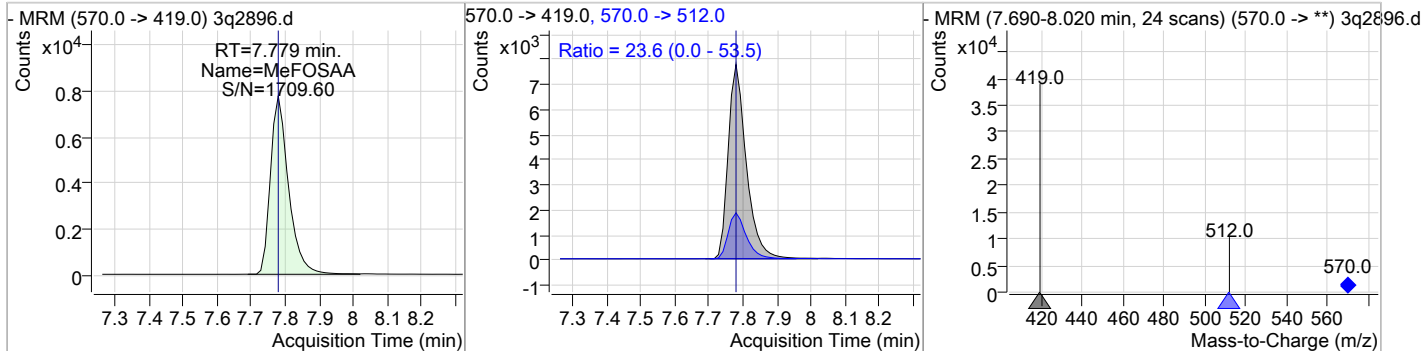
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.04	7.76	0.00	236951				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.34	7.76	0.00	185454	513.0 -> 219.0	22.4	0.0	52.5

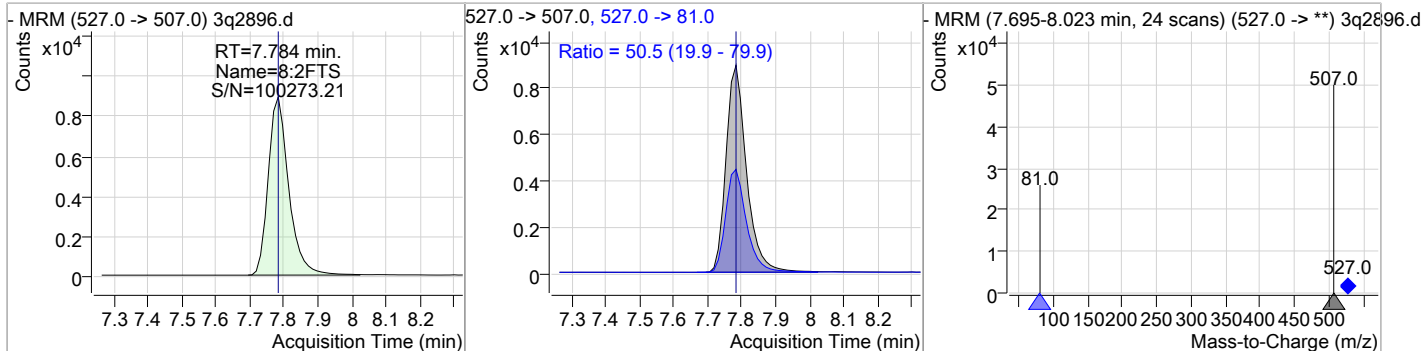


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	17.90	7.78	0.00	28729	570.0 -> 512.0	23.6	0.0	53.5

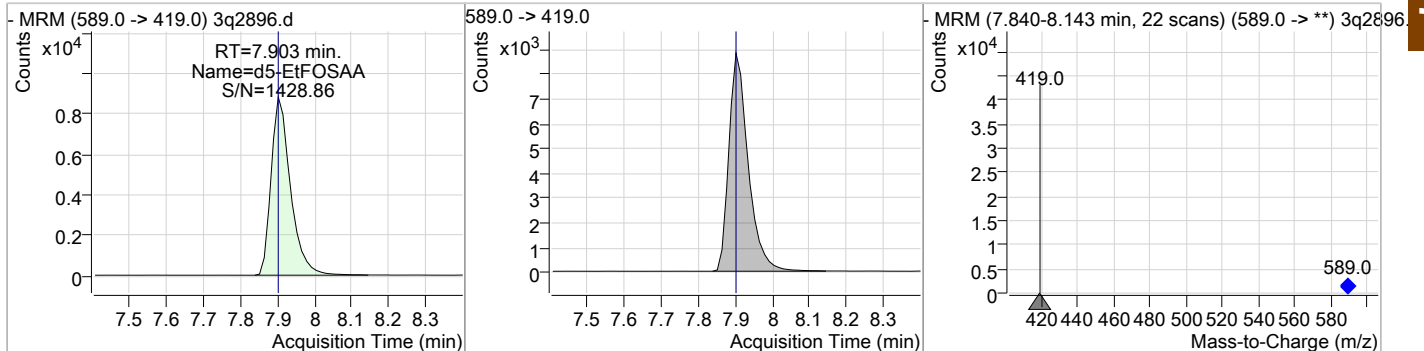


Perfluorinated Compounds by LC/MS/MS

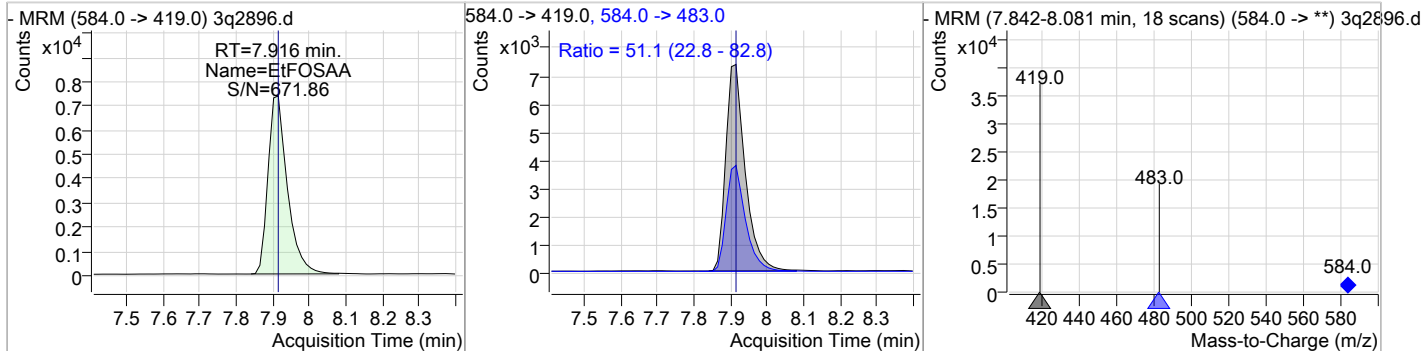
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	19.88	7.78	0.00	37330	527.0 -> 81.0	50.5	19.9	79.9



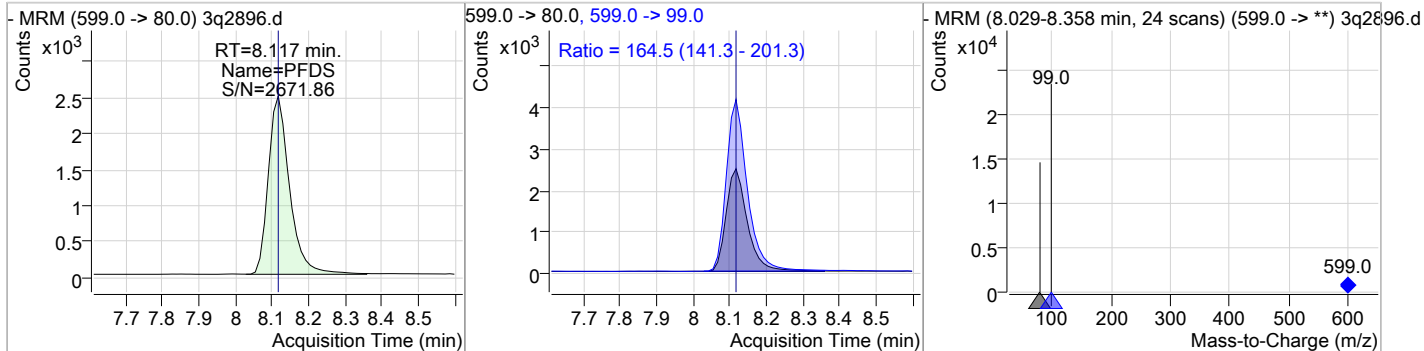
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	18.43	7.90	0.00	31671				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	19.50	7.92	0.00	26997	584.0 -> 483.0	51.1	22.8	82.8

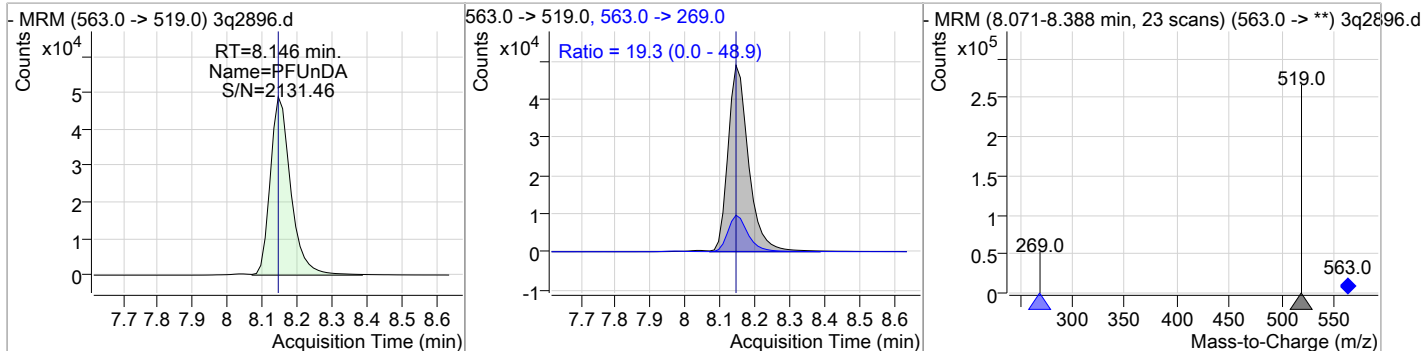


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	19.37	8.12	0.00	9998	599.0 -> 99.0	164.5	141.3	201.3

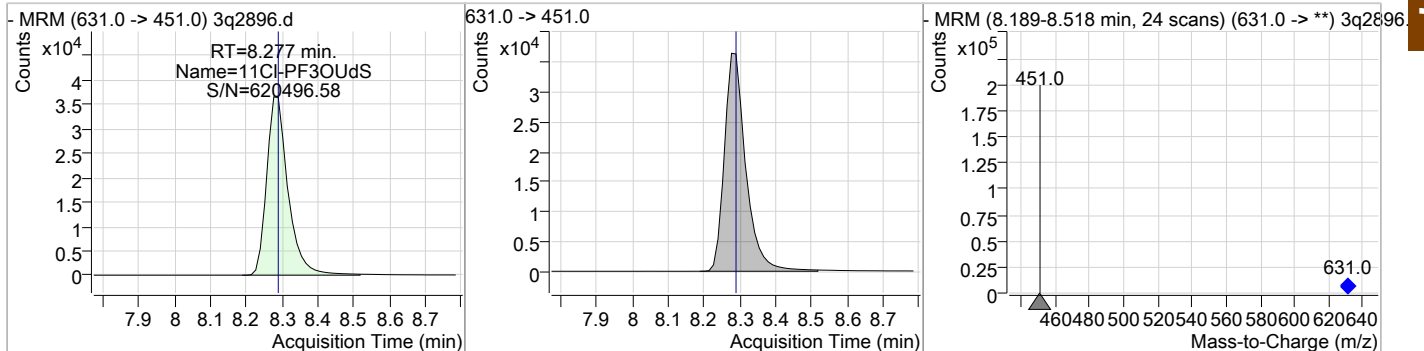


Perfluorinated Compounds by LC/MS/MS

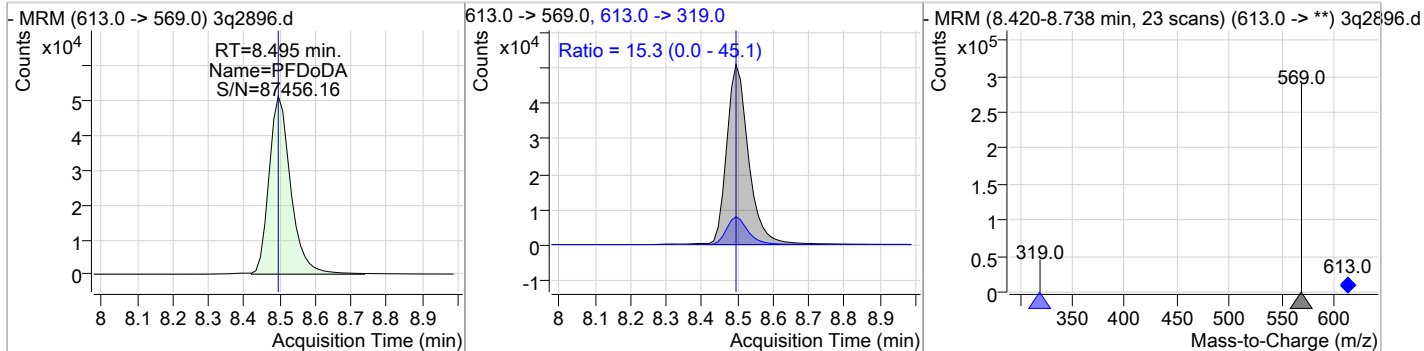
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	19.42	8.15	0.00	199516	563.0 -> 269.0	19.3	0.0	48.9



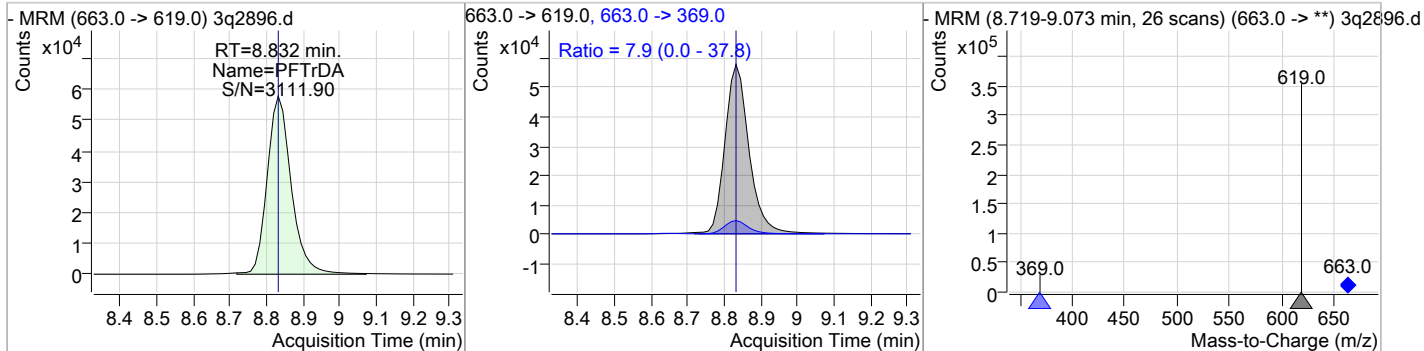
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	18.03	8.28	-0.01	150904	631.0 -> 451.0			



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	18.64	8.50	0.00	216293	613.0 -> 319.0	15.3	0.0	45.1

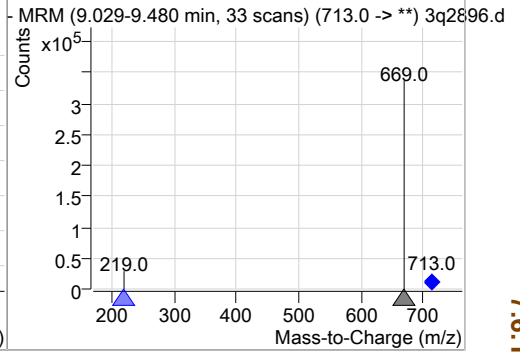
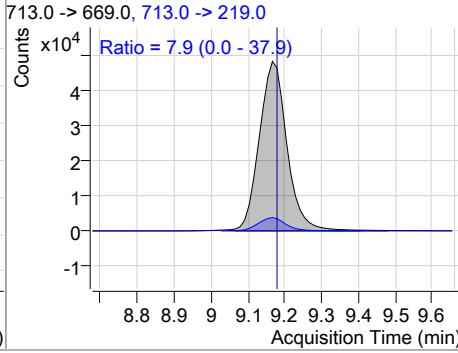
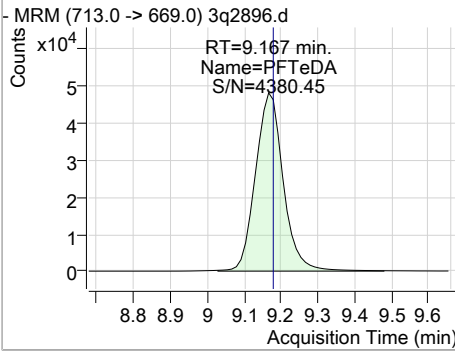


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	19.62	8.83	0.00	264799	663.0 -> 369.0	7.9	0.0	37.8



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	19.55	9.17	-0.01	251120	713.0 -> 219.0	7.9	0.0	37.9



7.6.12
7

Manual Integration Approval Summary

Sample Number: S3Q72-CC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2896.D **Analyst approved:** 04/12/19 13:38 Nancy Saunders
Injection Time: 04/12/19 13:04 **Supervisor approved:** 04/12/19 17:23 Norman Farmer

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.01	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.25	Split peak

7.6.12.1

7

Perfluorinated Compounds by LC/MS/MS

Data File : 3q2906.d
 Operator : nancyf
 Acq. Method : 537_LIST_GENX.m
 Acq. Date-Time : 4/12/2019 3:37:56 PM
 Sample Name : cc72-20
 Vial : P1-A7
 DA Method File : 537_GENX_041219_S3Q72.quantmethod.xml
 Batch Name : s3q72.batch.bin
 Sample Information : op74506,S3Q72,130,,1.0,1,water

Compound	RT	QIon	Resp.	Conc. Units	Dev(Min)
Internal Standards					
13C2-6:2FTS	6.674	429.0 -> 409.0	58524	20.00 µg/L	0.013
13C2-PFDoDA	8.494	615.0 -> 570.0	263287	20.00 µg/L	0.000
13C2-PFOA	6.691	415.0 -> 370.0	240721	20.00 µg/L	0.013
13C3-PFPeA	3.622	266.0 -> 222.0	165089	20.00 µg/L	0.000
13C4-PFOS	7.268	503.0 -> 80.0	60769	20.00 µg/L	0.016
d3-MeFOSAA	7.779	573.0 -> 419.0	30594	20.00 µg/L	0.000
System Monitoring Compounds					
13C2-PFDA	7.759	515.0 -> 470.0	242847	20.08 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 100.4%	
13C2-PFHxA	5.024	315.0 -> 270.0	206951	18.88 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 94.4%	
d5-EtFOSAA	7.903	589.0 -> 419.0	32251	18.17 µg/L	0.000
Spiked Amount: 20.00	Range: 70.0 - 130.0%			Recovery = 90.8%	
13C3-HFPO-DA	5.328	287.0 -> 169.0	72880	98.66 µg/L	0.013
Spiked Amount: 100.00	Range: 70.0 - 130.0%			Recovery = 98.7%	
Target Compounds					
4:2FTS	4.921	327.0 -> 307.0	59477	18.77 µg/L	QValue 99
6:2FTS	6.676	427.0 -> 407.0	53245	18.96 µg/L	99
8:2FTS	7.784	527.0 -> 507.0	37213	19.37 µg/L	97
EtFOSAA	7.916	584.0 -> 419.0	27749	19.41 µg/L	95
FOSA	7.346	498.0 -> 78.0	94186	18.44 µg/L	100
MeFOSAA	7.779	570.0 -> 419.0	30031	18.12 µg/L	99
PFBA	1.739	213.0 -> 169.0	56310	17.31 µg/L	100
PFBS	3.941	299.0 -> 80.0	58393	18.11 µg/L	99
PFDA	7.759	513.0 -> 469.0	190934	20.47 µg/L	99
PFDoDA	8.495	613.0 -> 569.0	216950	18.81 µg/L	99
PFDS	8.117	599.0 -> 80.0	10277	19.47 µg/L	95
PFHpA	5.975	363.0 -> 319.0	293727	17.92 µg/L	100
PFHpS	6.696	449.0 -> 80.0	44205	18.60 µg/L	99
PFHxA	5.025	313.0 -> 269.0	101529	18.00 µg/L	100
PFHxS	6.020	399.0 -> 80.0	47694	18.18 µg/L	m 100
PFNA	7.284	463.0 -> 419.0	205184	18.73 µg/L	99
PFNS	7.730	549.0 -> 80.0	40890	19.58 µg/L	100
PFOA	6.693	413.0 -> 369.0	181430	18.67 µg/L	100
PFOS	7.269	499.0 -> 80.0	62296	18.69 µg/L	m 98
PFPeA	3.625	263.0 -> 219.0	200573	18.86 µg/L	100
PFPeS	5.155	349.0 -> 80.0	36657	18.58 µg/L	98
PFTeDA	9.167	713.0 -> 669.0	238277	18.66 µg/L	98
PFTrDA	8.832	663.0 -> 619.0	256614	19.14 µg/L	100
PFUnDA	8.159	563.0 -> 519.0	200702	19.66 µg/L	100
ADONA	6.073	377.0 -> 251.0	388905	17.99 µg/L	100
9Cl-PF3ONS	7.529	531.0 -> 351.0	36414	17.54 µg/L	100
11Cl-PF3OUdS	8.290	631.0 -> 451.0	152560	17.82 µg/L	100
HFPO-DA	5.321	329.0 -> 169.0	243003	97.18 µg/L	99

7.6.13
7

Perfluorinated Compounds by LC/MS/MS

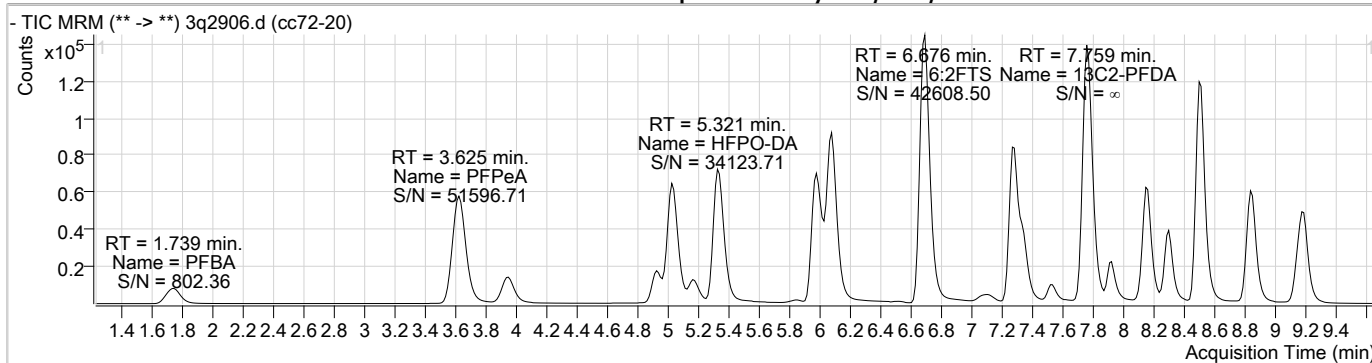
Compound	RT	QIon	Resp.	Conc.	Units	Dev(Min)
----------	----	------	-------	-------	-------	----------

= Qualifier out of range, m = manually integrated, + = Area summed

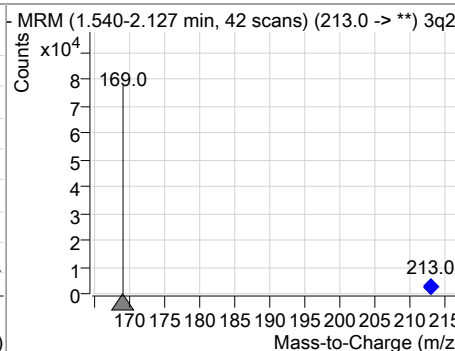
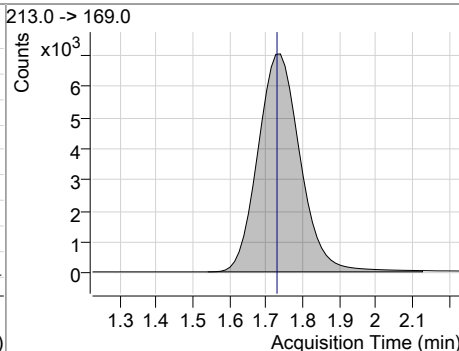
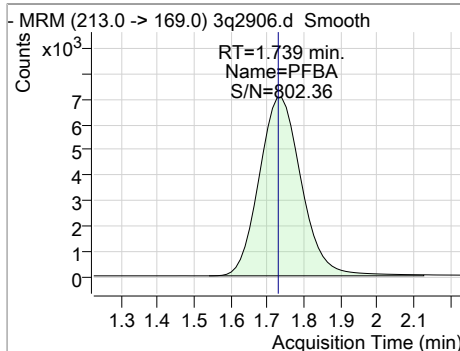
7.6.13

7

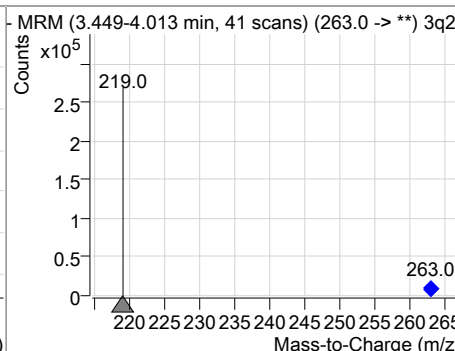
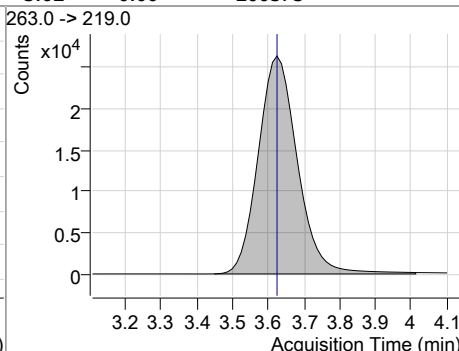
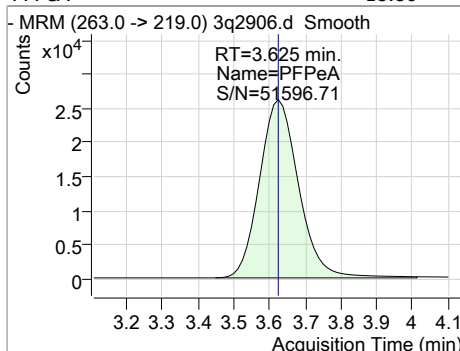
Perfluorinated Compounds by LC/MS/MS



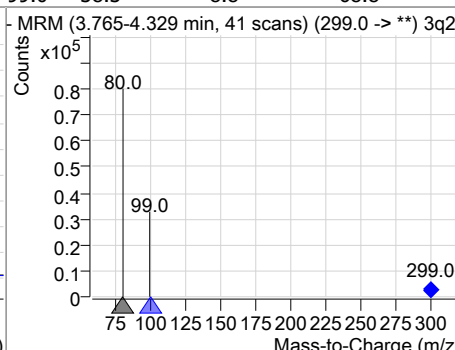
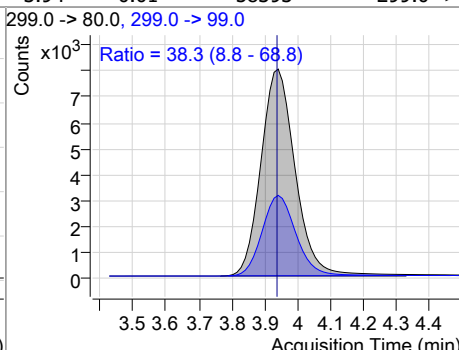
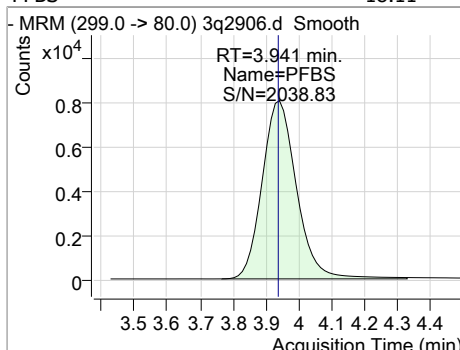
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBA	17.31	1.74	0.01	56310				



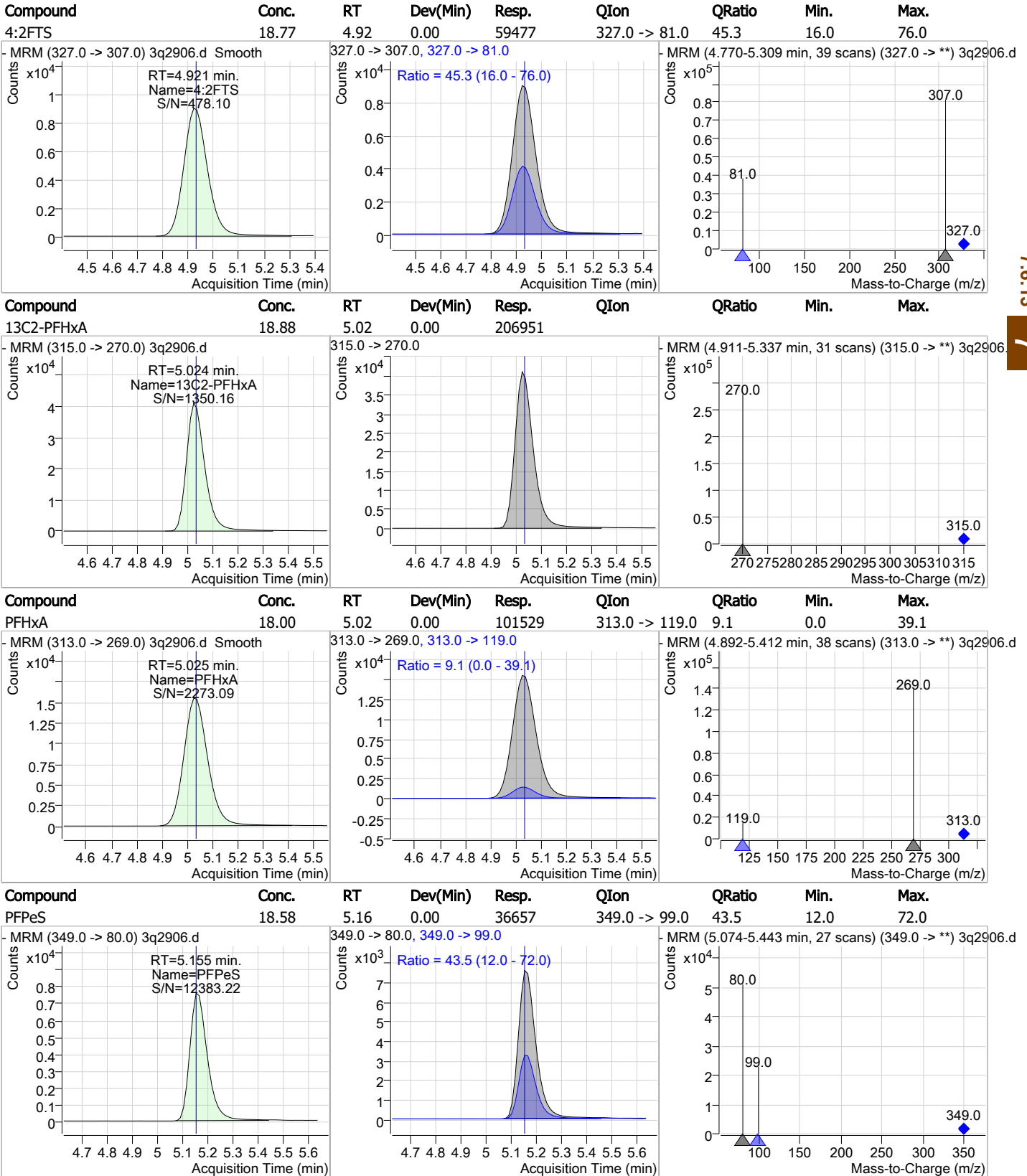
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFPeA	18.86	3.62	0.00	200573				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFBS	18.11	3.94	0.01	58393	299.0 -> 99.0	38.3	8.8	68.8



Perfluorinated Compounds by LC/MS/MS

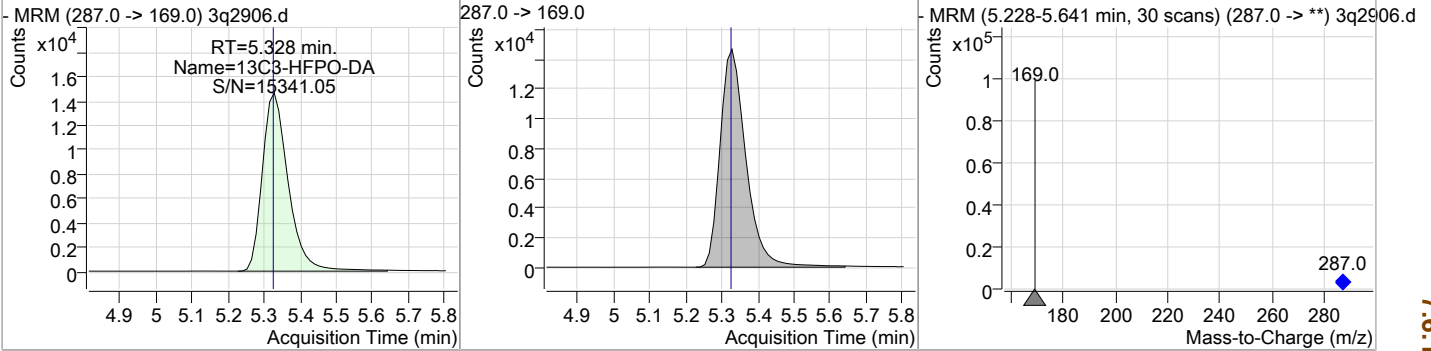


7.6.13
7

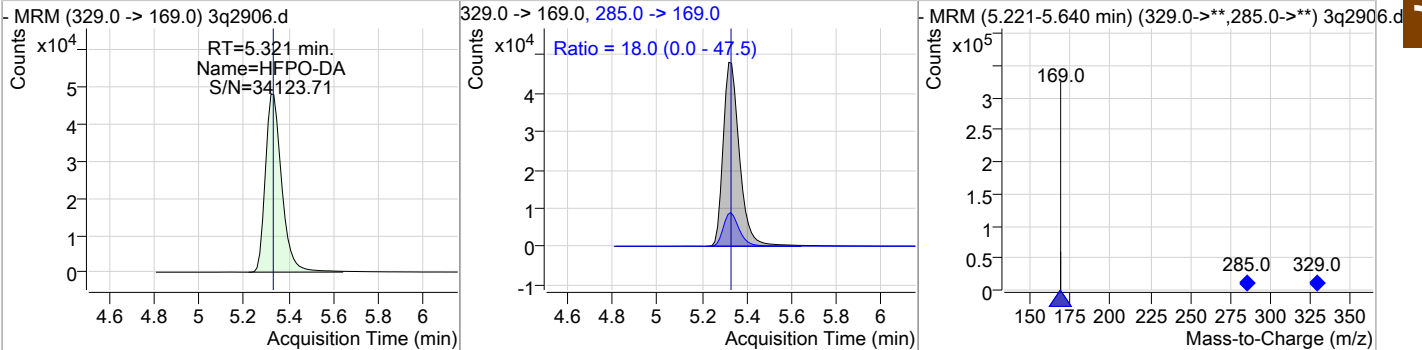


Perfluorinated Compounds by LC/MS/MS

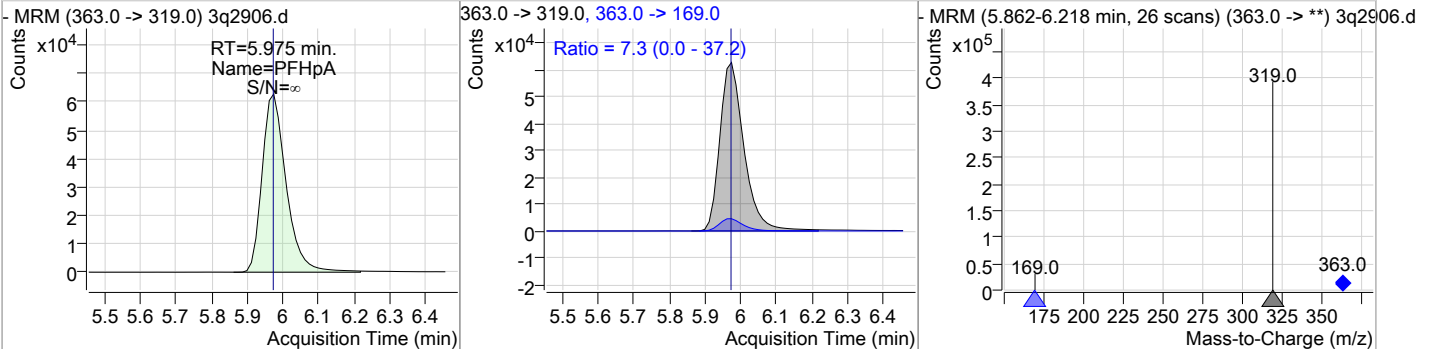
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C3-HFPO-DA	98.66	5.33	0.01	72880				



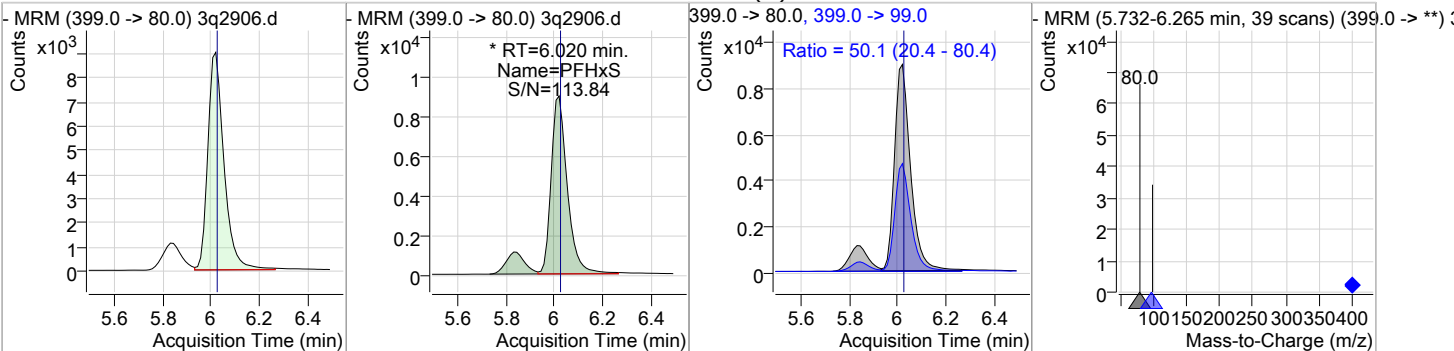
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
HFPO-DA	97.18	5.32	0.00	243003	285.0 -> 169.0	18.0	0.0	47.5



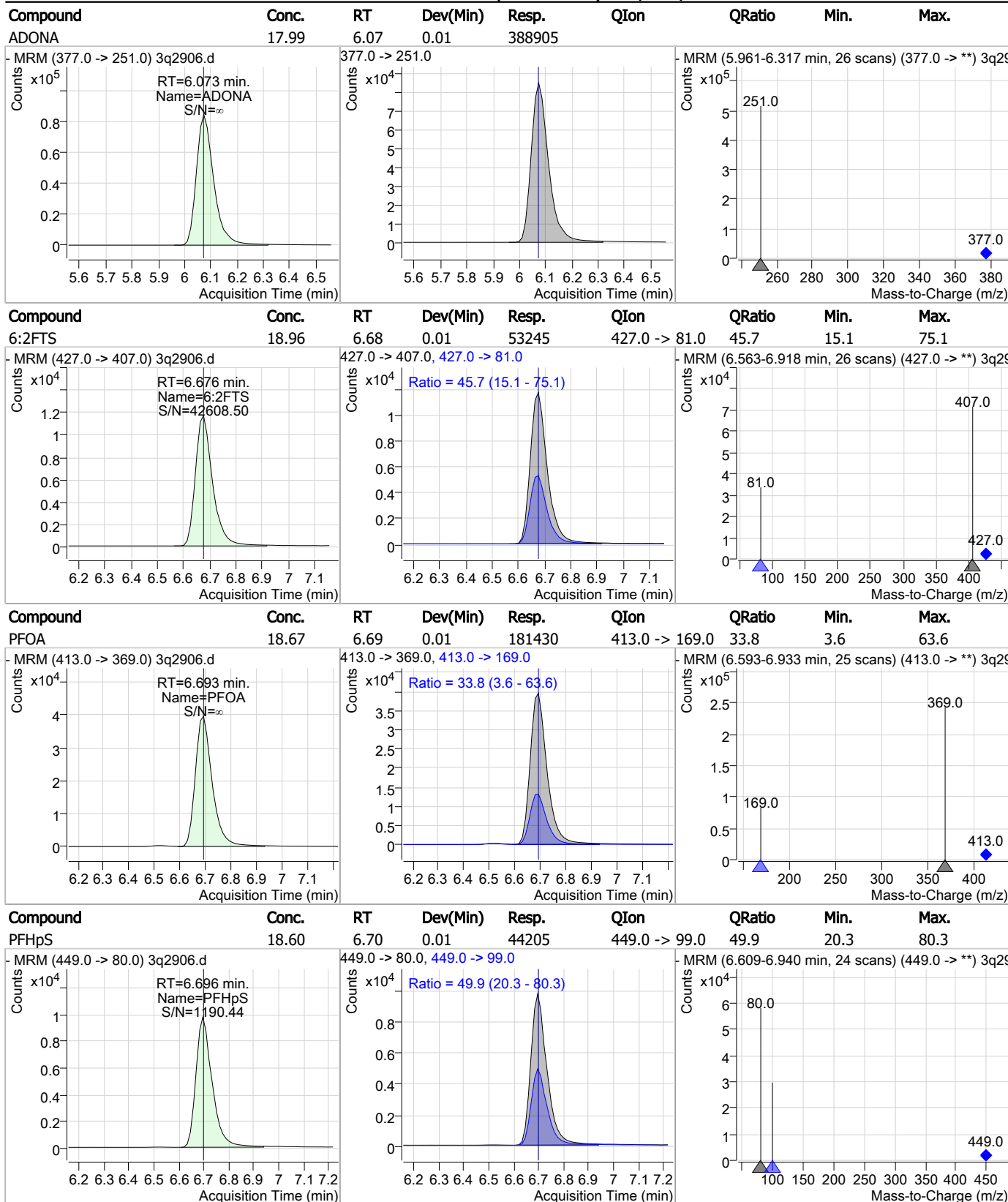
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHpA	17.92	5.97	0.01	293727	363.0 -> 169.0	7.3	0.0	37.2



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFHxS	18.18	6.02	0.01	47694 (m)	399.0 -> 99.0	50.1	20.4	80.4



Perfluorinated Compounds by LC/MS/MS

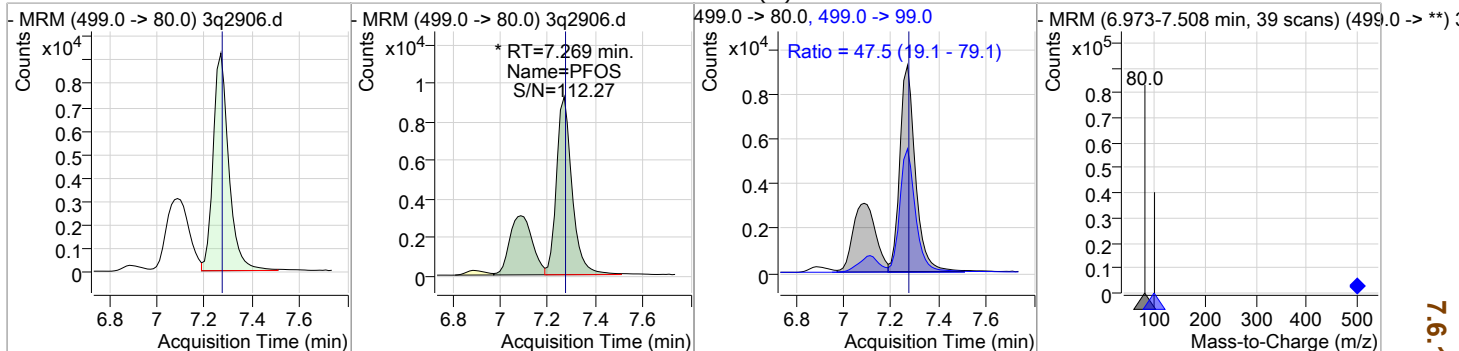


7.6.13

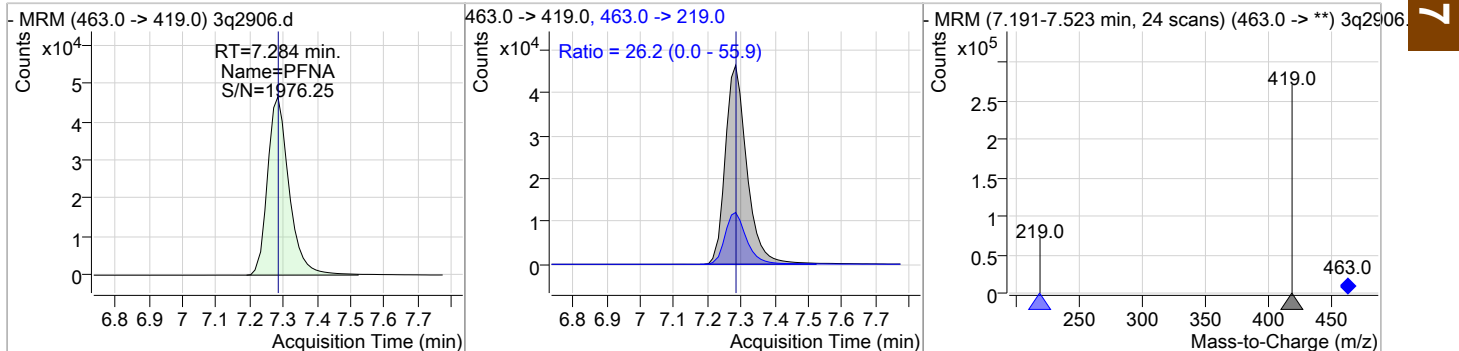
7

Perfluorinated Compounds by LC/MS/MS

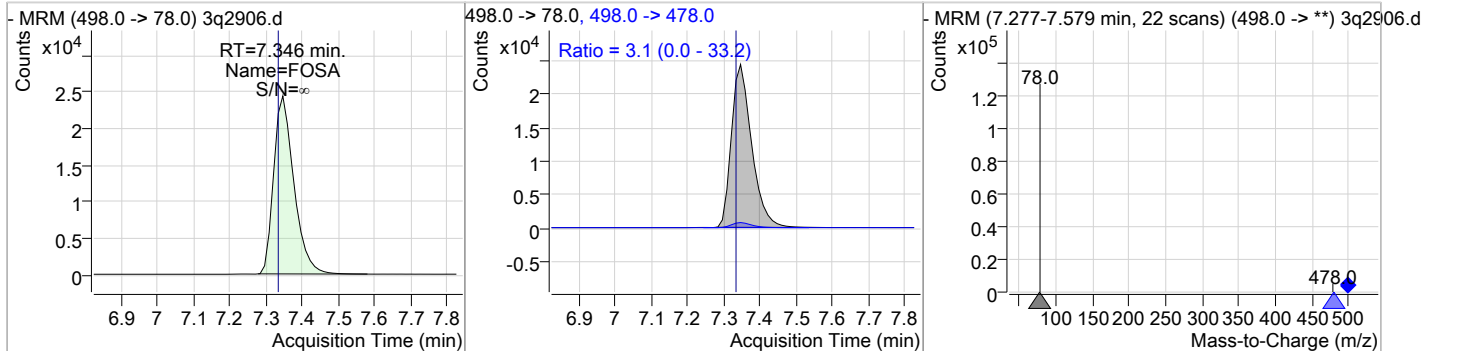
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFOS	18.69	7.27	0.02	62296 (m)	499.0 -> 99.0	47.5	19.1	79.1



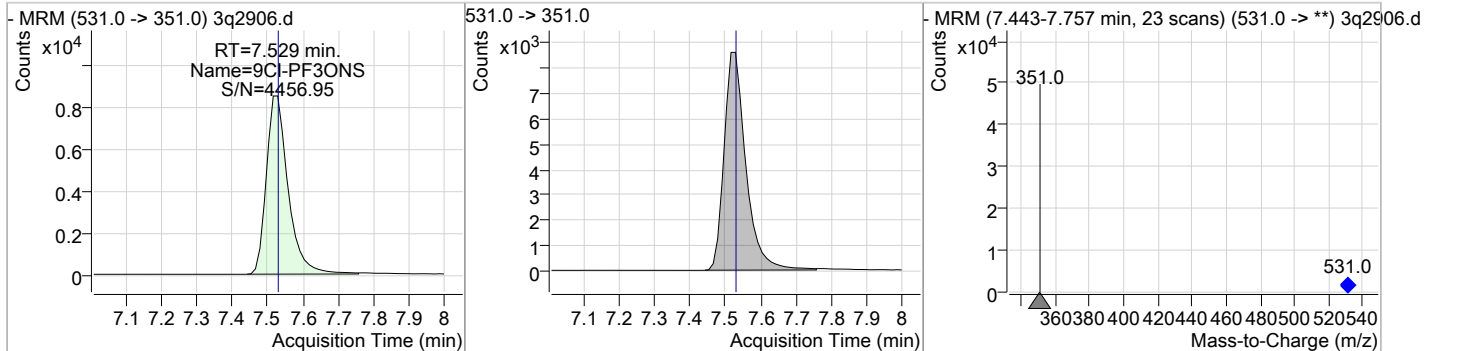
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNA	18.73	7.28	0.01	205184	463.0 -> 219.0	26.2	0.0	55.9



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
FOSA	18.44	7.35	0.01	94186	498.0 -> 478.0	3.1	0.0	33.2

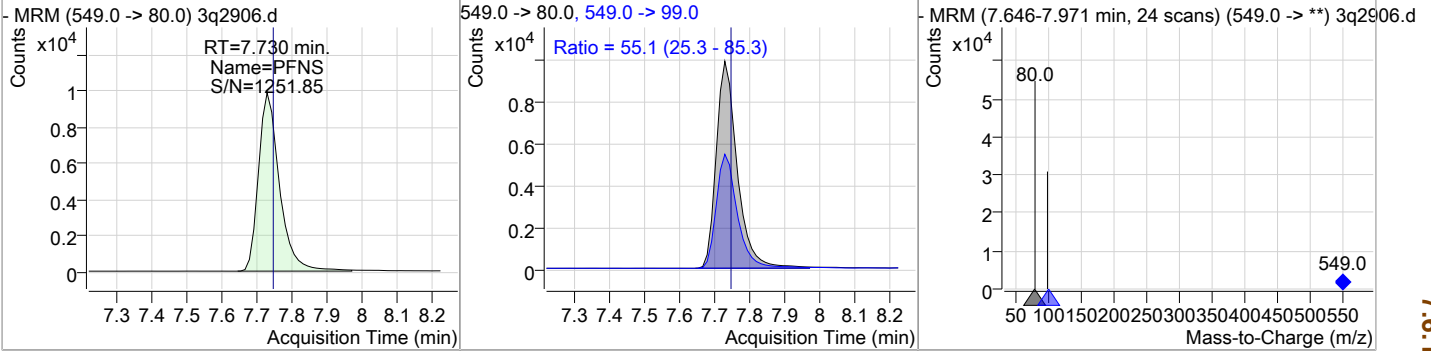


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
9CI-PF3ONS	17.54	7.53	0.01	36414	531.0 -> 351.0			

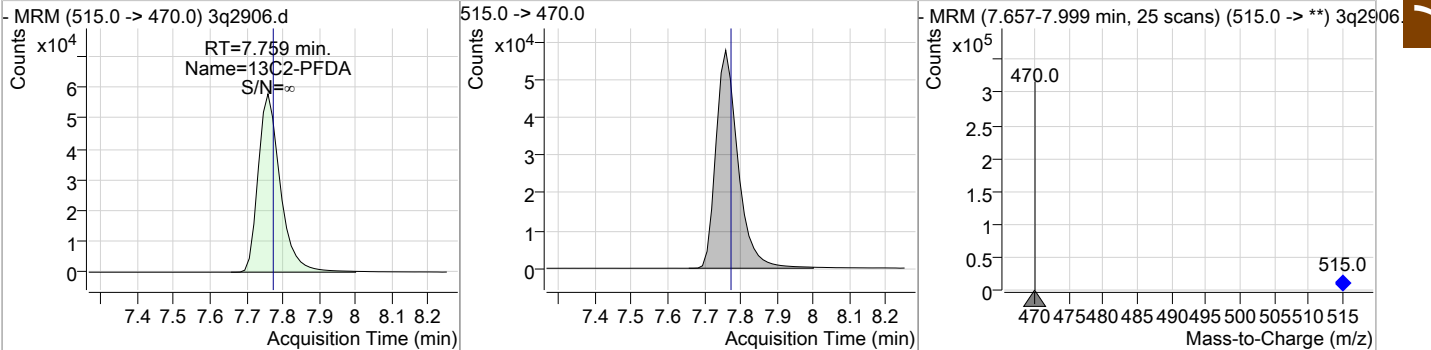


Perfluorinated Compounds by LC/MS/MS

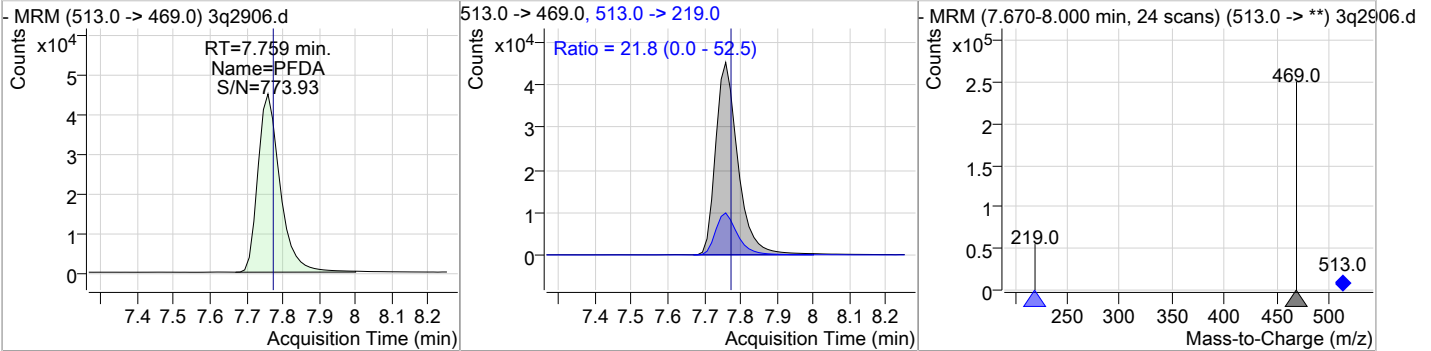
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFNS	19.58	7.73	0.00	40890	549.0 -> 99.0	55.1	25.3	85.3



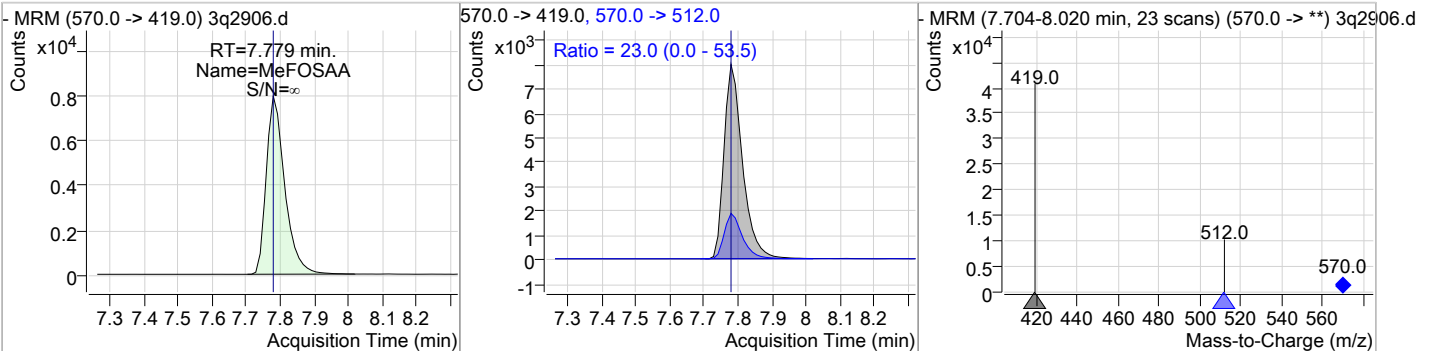
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
13C2-PFDA	20.08	7.76	0.00	242847				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDA	20.47	7.76	0.00	190934	513.0 -> 219.0	21.8	0.0	52.5

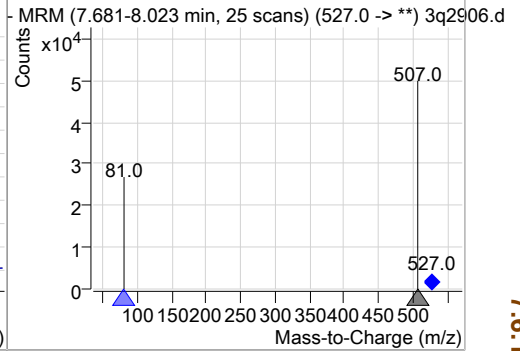
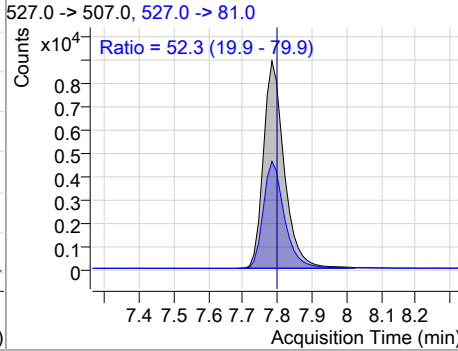
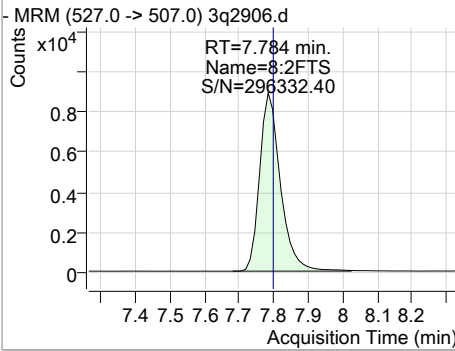


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
MeFOSAA	18.12	7.78	0.00	30031	570.0 -> 512.0	23.0	0.0	53.5

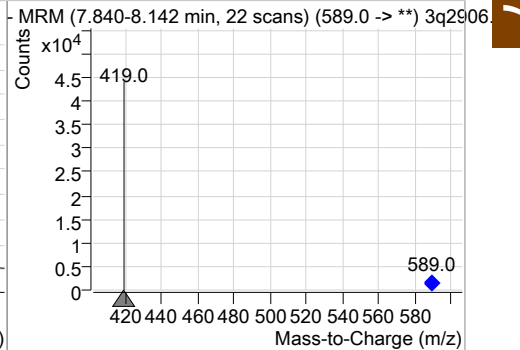
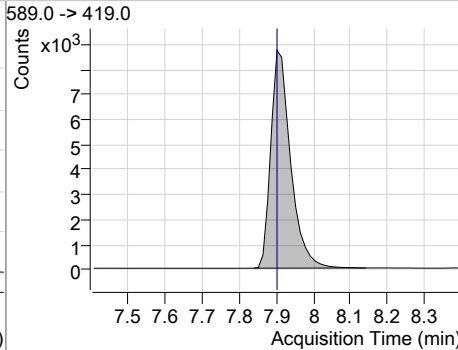
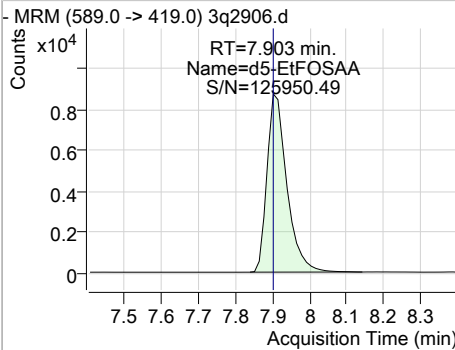


Perfluorinated Compounds by LC/MS/MS

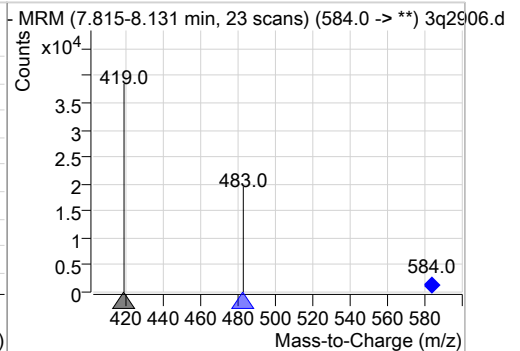
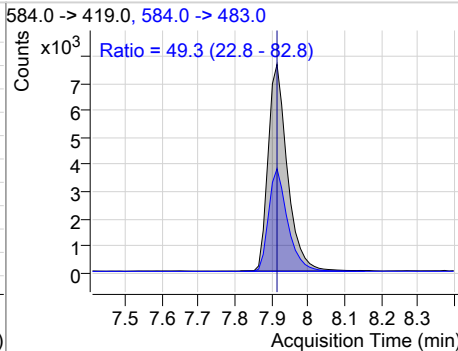
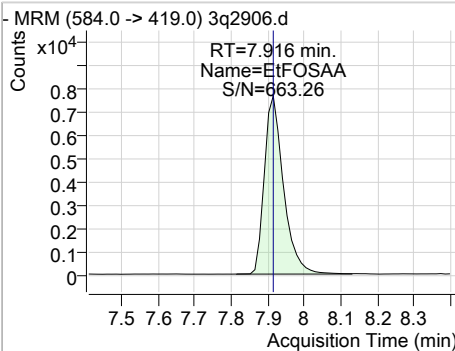
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
8:2FTS	19.37	7.78	0.00	37213	527.0 -> 81.0	52.3	19.9	79.9



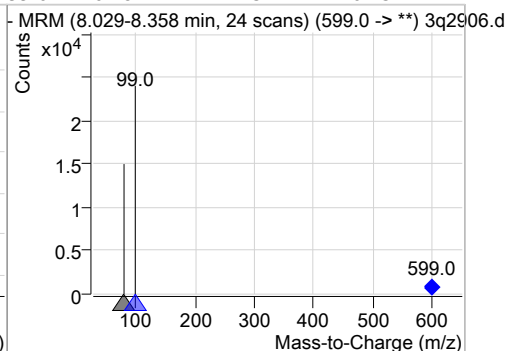
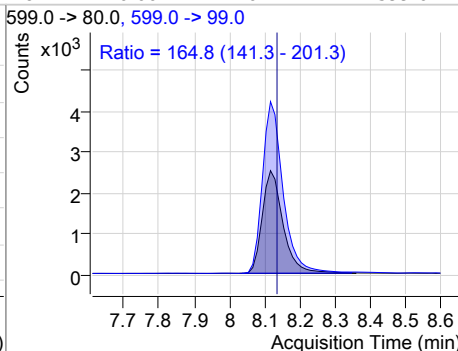
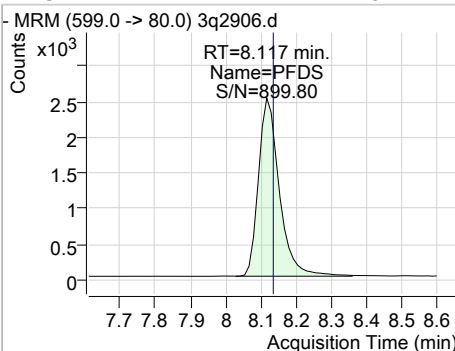
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
d5-EtFOSAA	18.17	7.90	0.00	32251				



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
EtFOSAA	19.41	7.92	0.00	27749	584.0 -> 483.0	49.3	22.8	82.8

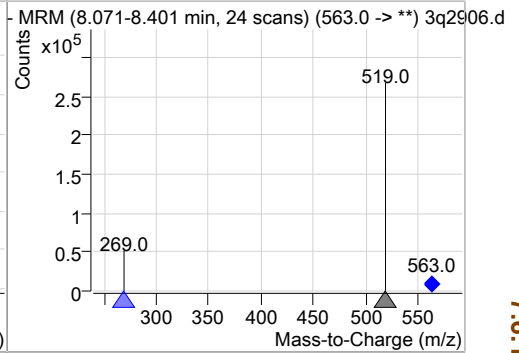
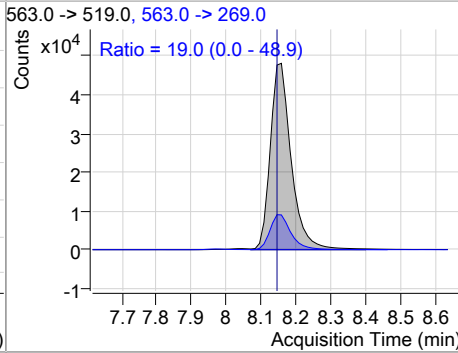
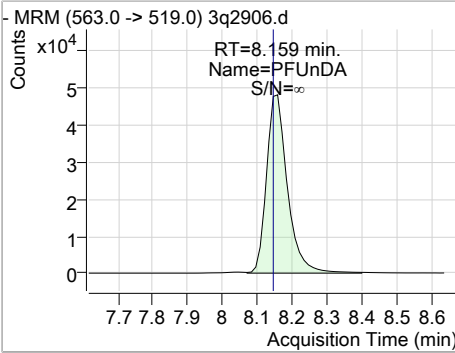


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDS	19.47	8.12	0.00	10277	599.0 -> 99.0	164.8	141.3	201.3

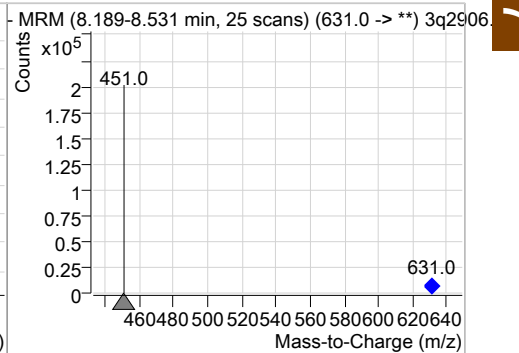
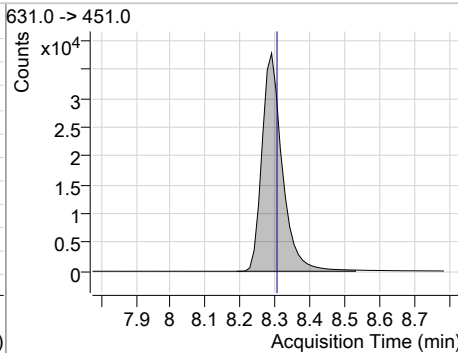
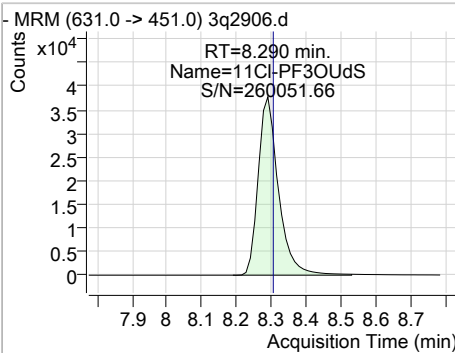


Perfluorinated Compounds by LC/MS/MS

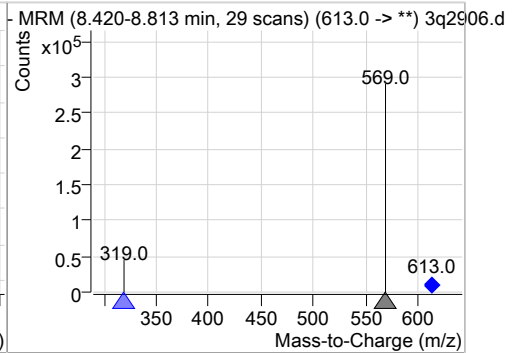
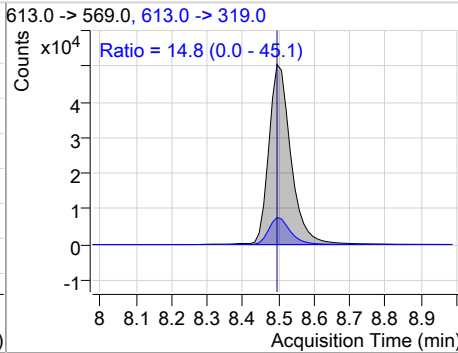
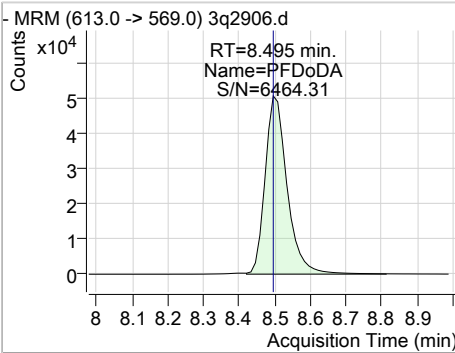
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFUnDA	19.66	8.16	0.01	200702	563.0 -> 269.0	19.0	0.0	48.9



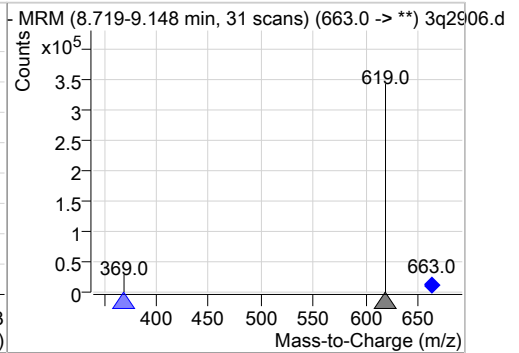
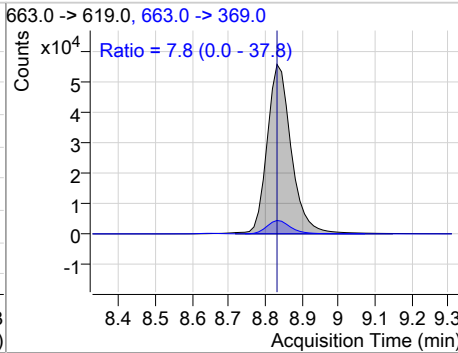
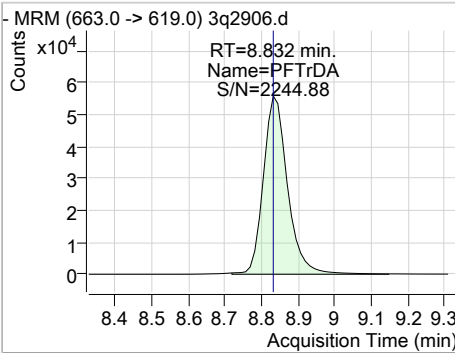
Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
11Cl-PF3OUdS	17.82	8.29	0.00	152560	631.0 -> 451.0	14.8	0.0	45.1



Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFDoDA	18.81	8.50	0.00	216950	613.0 -> 319.0	14.8	0.0	45.1

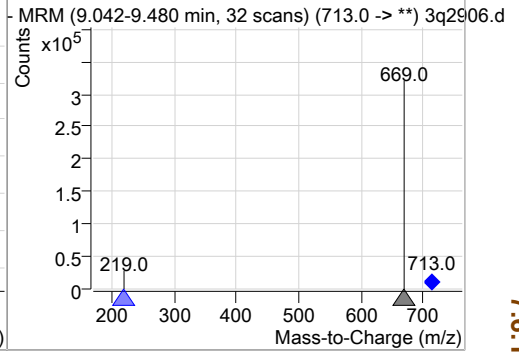
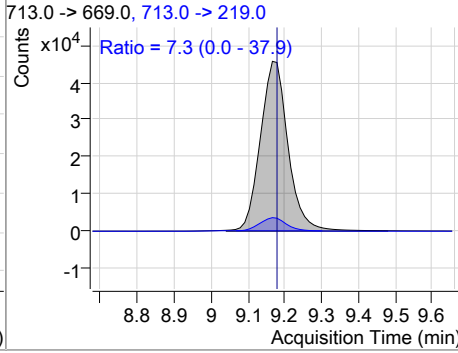
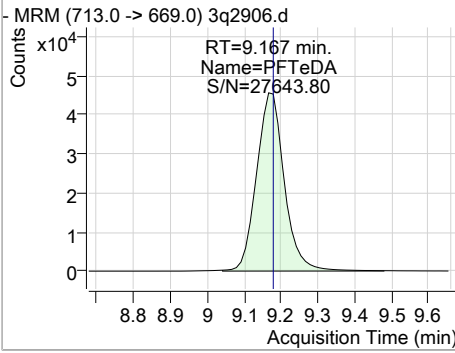


Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTTrDA	19.14	8.83	0.00	256614	663.0 -> 369.0	7.8	0.0	37.8



Perfluorinated Compounds by LC/MS/MS

Compound	Conc.	RT	Dev(Min)	Resp.	QIon	QRatio	Min.	Max.
PFTeDA	18.66	9.17	-0.01	238277	713.0 -> 219.0	7.3	0.0	37.9



7.6.13
7



Manual Integration Approval Summary

Sample Number: S3Q72-CC72 **Method:** EPA 537 MOD
Lab FileID: 3Q2906.D **Analyst approved:** 04/15/19 09:07 Nancy Saunders
Injection Time: 04/12/19 15:37 **Supervisor approved:** 04/15/19 11:04 Mike Eger

Parameter	CAS	Sig#	R.T. (min.)	Reason
Perfluorohexanesulfonic acid	355-46-4		6.02	Split peak
Perfluorooctanesulfonic acid	1763-23-1		7.27	Split peak

7.6.13.1

7

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Porosilk EC18
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	320

METHODS:	PFC List 6mX
ACQ. METHOD:	537 List 6mX
PROC. METHOD:	537 6mX 041119 50-72
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q 72

ANALYST:	ABS
ELUENT A LOT #:	140867 w/AD
ELUENT B LOT #:	186960 L
ISTD Lot # / amount added:	12250
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2806	A1 A1	CLB	PFC							BL
3Q 07	A1	CLB								302
3Q 08	A7	CLB-20		LCMS3Q4	100/100					Response low run com
3Q 04	A1	CLB								BL
3Q 10	A2	IC 72-0.5		LCMS3Q4	25/500			50		high deep point
3Q 11	A3	-1.0				1/500		50		✓
3Q 12	A4	-2.0				10/500		50		✓
3Q 13	A5	-5.0				25/500		50		✓
3Q 14	A6	-10				50/500		50		✓
3Q 15	A7	FC 72-20				100/500		50		✓
3Q 16	A8	IC 72-50				25/500		50		✓
3Q 17	A9	-100				10		50		✓
3Q 18	B103	FC 72-20		LC1204	100/100			50		Pass
3Q 19	B2	-20		LC1204	5/500			50		Pass
3Q 20	B3	-20		94143				50		Pass
3Q 21	B4	OP 74534-b5		OP74534	17			50		✓
3Q 22	B7	-mb								BL ss T A2
3Q 23	B6	FA63003-10						50 P22		✓
3Q 24	B7	LA 63004-5						50		✓
3Q 25	B8	-6						P38		✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers.
 **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Poroshell EC10
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	300

METHODS:	PFC List Run X
ACQ. METHOD:	S37 List Run X
PROC. METHOD:	S37 Run X 041119 S3-SB
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q 72

ANALYST:	NAS
ELUENT A LOT #:	190067 w/AD
ELUENT B LOT #:	180960 w
ISTD Lot # / amount added:	122TB
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2826	A134	FA63084-7	PFC	0974534	17					✓ RA PD ↓
3Q 27	C1	-8								✓
3Q 28	C2	-9								✓
3Q 29	C3	0974534-ms						SP		✓
3Q 30	C4	msd						SP F		✓
3Q 31	A7	CC72-20		LCMS1214	100/150			SP		Pass
3Q 32	A1	CCB								BDL
3Q 33	C5	FA63084-10		0974534	1X					✓
3Q 34	C6	-11						SP EF ✓		✓
3Q 35	C7	-12						✓		✓
3Q 36	C8	-16						✓		✓
3Q 37	C9	-17								✓
3Q 38	A1	-18								✓
3Q 39	O2	-19								✓
3Q 40	O3	-20						✓		✓
3Q 41	O4	-21						P=SP		✓
3Q 42	O5	-22								✓
3Q 43	A7	CC72-20		LCMS1214	100/150			SP		Pass
3Q 44	A1	CCB								BDL
3Q 45	O6	0974514-b5		0974514	1X			SP		✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Poruho 11 EC10
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	390

METHODS:	PFC List 6mmx
ACQ. METHOD:	S37 List 6mmx
PROC. METHOD:	S37 6mmx 0.41119 S3Q72
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q 72

ANALYST:	NAS
ELUENT A LOT #:	190867 w/ Acidic Acid
ELUENT B LOT #:	186660 L
ISTD Lot # / amount added:	12250
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2846	P107	0174514-mh	PFC	0174514	1X					Pass
3Q 47	08	FA62477-30								✓
3Q 48	09	FA63004-4								-
3Q 49	E1	-5								-
3Q 50	E2	now -6								✓
3Q 51	E3	514 -7								✓
3Q 52	E4	0174514-mi						SP		✓
3Q 53	E5	-ms0						SP		✓
3Q 54	E6	FA63004-B						PDB		✓
3Q 55	A7	CC72-20		LCMS1254	100/50			SP		Pass
3Q 56	A1	CCB								Pass
3Q 57	E7	FA63004-9		0174514	1X					-
3Q 58	E8	-10								-
3Q 59	E9	-11								-
3Q 60	F1	-12								✓
3Q 61	F2	-13								✓
3Q 62	F3	-16								✓
3Q 63	F4	-17								✓
3Q 64	F5	-18								✓
3Q 65	A7	CC72-20	✓	LCMS1254	100/50			SP		Pass

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration

*Manual Integration Rationale for Peaks other than including Branched Isomers.

**< Conductivity Limit For Perchlorate by SW846 6850

All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Acquity H E11B
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	380

METHODS:	PFL List RunX
ACQ. METHOD:	S37 List RunX
PROC. METHOD:	S37 RunX 041119 S3Q72
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q 72

ANALYST:	AA
ELUENT A LOT #:	140067 w/BK
ELUENT B LOT #:	146960 z
ISTD Lot # / amount added:	1253
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2866	P1 A1	CCB	PFL							NDL
3Q 67	F6	0074515-6		0074515	14			SP		✓
3Q 68	F7	-mb						PII		NDL
3Q 69	F8	FA63055-5								✓
3Q 70	F9	0074515-ms						SP		✓
3Q 71	P2 A1	-msd						SP		✓
3Q 72	A2	FA63055-6								✓
3Q 73	A3	7						PII		✓
3Q 74	A4	-8						PII		✓
3Q 75	A5	0074515-9								✓
3Q 76	A6	-10						PII		✓
3Q 77	P1 A7	CC72-20		CCMS3Q	100/50			SP		NDL
3Q 78	A1	CCB								NDL
3Q 79	P2 A7	FA63055-11		0074515	14					✓
3Q 80	A8	-12								✓
3Q 81	A9	-13								✓
3Q 82	B1	-13								✓
3Q 83	B2	-14						PII		✓
3Q 84	B3	-20								✓
3Q 85	B4	-21								✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Perchlorate 11E19
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	380

METHODS:	PFC LIST 6mmX
ACQ. METHOD:	S37 LIST 6mmX
PROC. METHOD:	S37 6mmX 041119 S3Q72
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q

ANALYST:	NAS
ELUENT A LOT #:	140467 w/AD
ELUENT B LOT #:	186460 +
ISTD Lot # / amount added:	12253
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2806	P295	FA 63055-22	PFC	0074515	17					✓
3Q 87	L B6	-23						P28		✓
3Q 88	L B7	-24								✓
3Q 89	P1A7	CC 72-20		LCMS1254	100/150			SP		Pass
3Q 90	L A1	CCB								
3Q 91	L B5	OP 74534-MB		0074534	10					NOI SOUT P 2nd run
3Q 92	P298	FA 63055-26		0074515						✓
3Q 93	B9	-27		+						✓
3Q 94	P1B9	FA 63084-7		0074534						NO ↓ 1st run
3Q 95	L F7	OP 74515-MB		0174515						NOI SOUT P 2nd run
3Q 96	L M	CC 72-20		LCMS1254	100/150					P28
3Q 97	L A1	CCB								BOL
3Q 98	P2C1	OP 74558-MB		0074558	17					✓
3Q 99	C2	-mb								BOL 150A
3Q 900	C3	FA 63114-1								✓
3Q 01	C4	OP 74558-MB								✓
3Q 02	C5	FA 63114-2								✓
3Q 03	C6	OP 74558-dup								✓
3Q 04	C7	FA 63114-3								✓
3Q 05	C8	-4								✓

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

SGS - ORLANDO

LCMS3-3Q ANALYSIS LOG

DATE:	04-11-19
COLUMN TYPE:	Perchlorate 150 x 4.6
AMOUNT INJECTED:	4 ul
INSTRUMENT:	LCMS3-3Q
HEAD PRESSURE:	300

METHODS:	PFC LIX + 6mM X
ACQ. METHOD:	537 LIX + 6mM X
PROC. METHOD:	537 6mM 0.91119 530-72
CALIB. DATE:	04-11-19
RUN BATCH:	S3Q 72

ANALYST:	NAS
ELUENT A LOT #:	190067 v. 2A
ELUENT B LOT #:	1920960 ↓
ISTD Lot # / amount added:	122505
INJ STD Lot # / amount added:	

DATA FILE	ALS #	SAMPLE ID	SAMPLE METHOD	OP BATCH	DF	ISTD DILUTION	ION RATIO	MANUAL INTEGRATIONS*	SCON <CL**	COMMENTS
3Q 2906	P1A7	CL 72-20	PFC	LCMS3-3Q	100/RW					PUS
3Q 07	↓ A1	CLB								BOL
3Q 08	P2C4	RA 63152-1		0174550	1*					✓
3Q 09	↓ D1	RA 63112-1								✓
3Q 10	↓ D2	RA 63117-5								✓
3Q 11	↓ D3	-6								✓
3Q 12	↓ D4	-7								✓
3Q 13	↓ D5	-8								✓
3Q 14	P1A7	CL 72-20		LCMS3-3Q	100/RW					PUS
3Q 15	↓ A1	CLB								BOL
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										
3Q										

NAS 04-15-19

Manual Integration Rationale SOP QA029: MP Missed Peak, OP Overlapping Peak, SP Split Peak, PDB Poorly Defined Baseline, PII Poor Instrument Integration
 *Manual Integration Rationale for Peaks other than including Branched Isomers. **< Conductivity Limit For Perchlorate by SW846 6850
 All strikeouts must be initialed and dated. If correction was not due to a transcription error, then list the reason for correction.

Analyst's Signature: 

SGS - ORLANDO

SPE LIQUID SAMPLE PREP REPORT

Date/Time: 4/11/19 08:25
 Started {mm/dd/yy 24:00}

Prep Method: 3535A or 537 or 537MOD (circle)
MB 04/12/19

Date/Time: 04/12/19 1100
 Finished {mm/dd/yy 24:00}

Analytical Method: LC537 LIST

Batch#: OP 74558 Ext. By: MF Conc. By: MB Viald By: MF

Sample ID	Bottle Number	Amount Extracted (ml)	Initial pH	Adjusted pH	Surrogate Amount	Spike Amount	Final Volume (ml)	Manifold ID	Comments
OP 74558 MB		125	6	N/A	20 uL		1 ml	C	
OP 74558 BS		125				50 uL			
FA03114 -1	1	125							
-2	1	125							
-3	1	125							
-4	1	125							
FA03152-1	1	250							ORANGE; TURBID
FA03112-1	8	125							
FA03117-5	1	125							
-6	1	125							
-7	1	125						D	
-8	1	125							
<i>MB 04/12/19</i>									
FA03114 -1	MS	2	125	6	N/A	20 uL	50 uL	1 ml	C
	MSD								
FA03114-2	DUP	2	125	6	N/A	20 uL		1 ml	C

Comments:

Surr.1 ID: LCMS1244 Conc: 1.0 PPM Exp. Date: 9/19/19 Inj. By: MF Ver. By: MF
 Spk.1 ID: LCMS1257 Conc: 400 PPB Exp. Date: 10/3/19 Inj. By: MF Ver. By: MF
 Spk.2 ID: — Conc: — Exp. Date: — Inj. By: — Ver. By: —
 Spk.3 ID: — Conc: — Exp. Date: — Inj. By: — Ver. By: —

TurboVap Temp (Therm ID): TU # 13 N-Evap Temp (Therm ID): —
 Observed Temp °C: 45°C Corr. Temp °C: — Observed Temp °C: — Corr. Temp °C: —

Methanol Lot # 187805 SPE Lot # S214-0085/519-001502 pH Paper # 212218
 Acetonitrile Lot # / Syringe filter Lot # / Reagent # 2% MOOH 187805
 Water Lot# OP 73908 Pre-filter Lot# / Reagent # / NR40H 7118050
 Solvent# / Carbon Lot# / Other /

Relinquished By: [Signature]
 Accepted By: [Signature]

Date: 04/12/19
 Date: 04/12/19 @ 11:35

ORLD-EXT-0001-3-08-FORM-extwater_spe.xls 032718

7.8.1
7